RECOMMENDED PRACTICES FOR PUBLIC GARDENS
WISHING TO SERVE THE TEENAGE AUDIENCE

by
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A thesis submitted to the Faculty of the University of Delaware in partial fulfillment
of the requirements for the degree of Master of Science in Public Horticulture

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ABSTRACT

Little research is available discussing why teenagers participate in public garden-based learning programs and what they hope to gain from their program experiences. To shed light on this topic, the researcher conducted 15 focus group interviews with teenage participants and 10 personal interviews with administrators of learning programs at the Brooklyn Botanic Garden, Chicago Botanic Garden, Delaware Nature Society, and Fairchild Tropical Botanic Garden. The researcher recorded, transcribed, analyzed, and then consolidated focus group data into two frequency groups. The “majority perspectives” were expressed and/or agreed upon by more than half of the teenagers at three or four of the case study sites while the “outlying perspectives” were expressed and/or agreed upon by fewer than half of the teenagers at two or more of the sites.

The majority perspectives suggest that teenagers wish to be given choices; to be empowered to move toward self-sufficiency; to be provided with opportunities to meet new people; to have fun and/or new learning experiences; and to belong. The outlying perspectives suggest that teenagers want opportunities to interact with technology; to relax in a peaceful environment; to learn about growing plants as food; to compete for recognition; and to be led by the appropriate individuals. By synthesizing research findings with existing youth development and public garden literature, the researcher developed the following four recommended practices for public gardens wishing to serve the teenage audience.

- Practice #1: Empower teenagers to make meaningful decisions.
- Practice #2: Promote life skills development, college preparedness, and self-sufficiency.
- Practice #3: Facilitate the development of new relationships among peers and adults.
- Practice #4: Provide fun, new learning opportunities.
Chapter 1

INTRODUCTION

The teenage audience is not often served by public garden education programs. Of the hundreds of organizational members of the American Public Gardens Association (formerly the AABGA), fewer than ten organizations were found to offer internships, apprenticeships, or other similar learning programs especially designed for the teenage audience. This scarcity of programming suggested that the public garden education community may be hesitant of serving teenagers. This hesitancy was also voiced during informal conversations between the researcher and public garden educators at the 2005 AABGA mid-Atlantic regional and national meetings. A subsequent literature review confirmed public gardens’ longstanding discomfort with the teenage audience.

Driscoll (1987) reported: “mention teenagers to public garden educators and administrators and likely reactions will range from scowls of disgust to, at best, expressions of genuine puzzlement” (pg.1). Recent publications have, however, challenged the apprehensive attitude of public garden educators toward the teenage audience. In reporting on the successes of the ECO-ACT and Fairchild Challenge programs, Hope (2004) and Lewis (2004) have revealed that public gardens are in fact, capable of providing programs that inspire involvement and promote measurable and positive changes in teenage participants. These studies contradict previously reported notions of the “unreachable and unteachable” (Driscoll, 1987) teenage audience. With
these negative stereotypes challenged, and two new success models published, the opportunity exists for public gardens to learn by example.

By examining existing models, public gardens may gain a functional understanding of the factors that enable success with the teenage audience. In studying these models, it is important to consider their ease and efficacy of transfer. Simply because a model is successful at one organization, does not mean it will be successful when transferred to another. Once the factors that enable success are clearly identified, however, then this information may be used to modify existing models, or design new programs to fit the parameters of any similar organization. Unfortunately, public garden researchers have yet to report on the enabling factors for public garden-based learning programs for teenagers. In the absence of field-specific literature, the researcher consulted the related and established discipline of youth development.

Youth development researchers have found that responding to teenage perspectives enables the success of organizations that serve teenage audiences (Quinn, 1999). If in fact “good programs listen carefully to the voices of young people…” (Quinn, 1999), then public gardens would seemingly benefit from an understanding of what these voices are saying about existing, public garden-based program models. Using a qualitative approach, this thesis research seeks to provide this essential insight into the teenage audience by identifying the motivations, interests, and expectations of middle and high school students participating in four public garden-based learning programs in the United States.
The following chapters describe the research design, present and discuss findings, and propose four recommended practices for public gardens wishing to serve the teenage audience.
Chapter 2

METHODOLOGY

The researcher conducted focus group interviews with teenage participants and personal interviews with administrative staff at the Brooklyn Botanic Garden’s (BBG) Garden Apprentice Program (GAP), the Chicago Botanic Garden’s (CBG) Science First and College First programs, the Delaware Nature Society’s (DNS) Christina Science Scholars (CSS) program, and the Fairchild Tropical Botanic Garden’s Fairchild Challenge (the Challenge). Interviews were recorded, transcribed, and analyzed by the researcher.

Participant interview questions (Appendix A, pg. 58) were based in the following themes:

- teenagers’ motivations toward participation in public garden-based learning program,
- teenagers’ expectations of their program experiences, and
- teenagers’ recommendations for improvement of their program experiences.

Administrator interview questions (Appendix B, pg. 61) were based on the above themes, and also included:

- administrators’ perspectives on their programs’ mission as well as the organizations’ success in achieving its missions,
- administrators’ perspectives on identifying and overcoming program challenges, and
• administrators’ perspectives on attracting teenagers and meeting the needs of the teenage audience.

**Site selection**

In order to qualify for this research study, prospective sites needed to offer at least one learning program that engaged the same group or groups of ten or more middle or high school students for more than seven days. At the time of selection, only three public-garden sites were known to qualify for this research and all three sites were selected: BBG, in Brooklyn, New York; CBG, in Glencoe, Illinois; and FTBG, in Coral Gables, Florida. DNS, in Hockessin, Delaware also offered a program that fit the parameters of this study. While DNS was not a public garden per se, the program offered by DNS was so similar to those offered by CBG, that DNS was selected as a logical fourth case study location.

Within each case study site, the following sessions of the following programs were studied: tiers one and four of BBG’s GAP program; session one of CBG’s College First and Science First programs; grade level seven, eight, and nine of the DNS’s CSS program; and the middle and high school sessions of FTBG’s Challenge program. A description of each of these programs is contained in Appendix C, pg. 64.

**Research methods and tools**

Interview questions (Appendix A, pg. 58 and Appendix B, pg 61) were generated by the researcher with support from the thesis committee, University of Delaware faculty, and members of the 4-H Cooperative State Research, Education and Extension Service list serve. Interview protocols, recruitment protocols, and consent
forms were generated by the researcher using templates provided by the Office of the
Vice Provost for Research at the University of Delaware. These documents are
located along with the “Application for human subjects approval” in Appendix D, pg.

73. The following protocol directed participant interview question development:

1. The researcher spoke with the administrators of each of the four
   program sites and asked which perspectives they wished to gain from
   their program participants.

2. The researcher consolidated administrative responses into emergent
   categories that included the motivations, expectations, and
   recommendations.

3. Within each emergent category, the researcher generated a series of
   questions.

4. These questions were sent to youth development researchers and
   refined based upon their comments.

5. Questions were submitted to the Human Subjects Review Board of the
   University of Delaware for approval.

6. Following approval, interview questions were piloted on a group of
   teenage participants of DNS’s “Teen Naturalists” program. These
   students volunteered to participate in this pilot interview. Within this
   interview, these students were presented with each question and
   prompted to offer feedback as to wording of each question, and the
   ability of the each question to elicit a response. Questions were then
   modified according to these responses.

7. Questions were re-submitted to the Human Subjects Review Board of
   the University of Delaware for final approval. The approved questions
   are located in Appendix A, pg. 58

   The following protocol directed administrator interview question
   development:

1. The researcher spoke with the administrators at three of the four
   program sites and asked which information they wished to know about
   one another’s programs.
2. The researcher consolidated administrative responses into emergent categories that included “general program information,” “program mission,” “program challenges,” and “program expectations for participants.”

3. The researcher used information in the general program information category to generate a questionnaire that was subsequently distributed to each of the four case study sites. The results from this questionnaire are presented in tables two, three, and four within Appendix E, pg. 89.

4. Within the remaining three emergent categories, the researcher generated a series of questions:
   a. These questions were reviewed by the thesis committee members and modified according to their responses.
   b. Final questions were re-submitted to the Human Subjects Review Board of the University of Delaware for final approval. These questions are located in Appendix B, pg. 61.

Interview and recruitment protocols, and consent forms were developed using templates provided by the Office of the Vice Provost for research at the University of Delaware. These documents are located in Appendix D, pg. 73. Protocols and consent forms for recruiting participants were developed to aid staff at each case study site. Because prospective recruiters were not trained in Human Subjects research, these documents were necessary to ensure that involvement in this study was voluntary on the part of the prospective participants.

The researcher digitally recorded, transcribed, coded, and analyzed all interview data. Data were analyzed using a computer-driven “Long-table approach” (Krueger & Casey, 2000). All transcriptions were color-coded using word processing software, analyzed for common themes based on the original interview questions, and then sorted into broad concept categories. The quotations within these concept categories were then analyzed for secondary themes and re-sorted into theme categories. The quotations within these theme categories were analyzed for specificity,
emotional delivery, consistency, and frequency and then distilled into two result categories; the “majority perspectives” and the “outlying perspectives.”

The majority perspectives represent a pool of quotations that were specific, delivered with emotion, and expressed and/or agreed upon by more than half of the case study participants at three or four of the case study sites. The outlying perspectives represent a pool of quotations that were specific, delivered with emotion, and expressed and/or agreed upon by fewer than half of the individuals at two or more of the four case study sites. While attention was paid to the frequency with which each concept was expressed within each site or among all sites, it would be a “huge mistake to assume that what is said most frequently is most important” (Krueger & Casey, 2000).

**Human subjects review and researcher training**

Focus group questions, personal interview questions and protocols, recruitment protocols, and consent forms were approved in advance of this research by the Office of the Vice Provost for Research at the University of Delaware. A copy of human subjects approval form is contained in Appendix F, pg. 93.

Prior to the onset of this research, the researcher received a Certification of Human Subjects Training (Appendix G, pg. 97) from the Office of the Vice Provost for Research at the University of Delaware, and received a two-day training in “Designing and conducting focus group interviews” from the team of Richard A. Krueger and Mary Anne Casey, authors of “Focus groups: A practical guide for applied research” (2000).
Focus group interviews with teenage participants

Participant characteristics

The characteristics of potential participants varied according to the recruiting parameters used by each case study site. An overview of participant characteristics may be found in table one on page 13.

The GAP program at BBG is a selective program. GAP participants have successfully completed an application process that includes short answer questions and a personal interview. GAP administrators recruit evenly from within the socio-economically and ethnically diverse borough of Brooklyn, New York. In selecting and recruiting students for GAP, an emphasis is placed on selecting students with a strong interest in GAP and in BBG, and on achieving an ethnically diverse pool of participants with an equal gender distribution.

The College First and Science First programs at CBG are also selective programs. College First and Science First participants have successfully completed an application process that includes a personal interview. Both College First and Science First target “Chicago [Illinois] Public School students from all areas and backgrounds in the City” (N. Patel, personal communication, July 2005). The College First program focuses on reaching students who, if they were to enter college, would be the first members of their families to do so. Science First participants tend to be higher performing students from underserved communities who “are motivated but… having trouble getting there” (N. Patel, personal communication, July 2005). College First and Science First participants exhibited to CBG a commitment to improving themselves and their socioeconomic position in life.
The Christina Science Scholars program at DNS is a semi-selective program. CSS participants have been recommended for the program by their science teachers and have completed and submitted an application that includes short answer questions. DNS works with science teachers in the Christina School District to recruit students who are average or below average performers in their science classes and are likely to benefit from the program.

The Challenge at FTBG is a non-selective program. Participation in the Challenge is initiated by school teachers in the Miami-Dade County School District, who register their schools to compete in the Challenge during the school year. To participate in the Challenge, students from registered schools must submit an entry or entries to their school representatives who in turn submits entries to FTBG. Administrators of the Challenge recruit schools from within Miami-Dade County’s diverse socio-economic communities.

**Participant selection**

To be eligible for case study interviews, teen participants needed to be entering into grades six through twelve and must have returned a consent form signed by their legal parent or guardian. Prior to the interview process, parental consent forms were sent to each institution where they were distributed by program staff to prospective participants. Prior to the onset of each initial interview, the researcher, along with staff, selected ten to twelve focus group participants from a pool of eligible teenagers. Care was taken to select an equal mix of boys and girls and to select an ethnic distribution reflective of the population of the program participants.
Due to the low rate of consent form return at FTBG, all eligible participants were selected. By chance, a balance was achieved between boys and girls and an approximately representative, ethnic distribution was maintained.

**Interview procedures**

The researcher gathered data from teenage participants using focus group interviews. Pre and post-participation interviews were conducted with “tier one” participants of the GAP program, each of three grade level sessions of the CSS program, and session one of the College First and Science First programs. Due to scheduling conflicts, the researcher conducted a post-participation interview with middle and high school participants of the Challenge, and with “tier four” participants of the GAP program. Further information on each of these programs may be found in Appendix C, pg. 64.

Pre-participation interviews were conducted within the first two days of each program. Interview questions were predetermined and follow-up questions were asked as needed. These questions were designed to solicit teenagers’ motivations for participation, first impressions, and program expectations. A second set of predetermined interview questions was enacted during post-participation interviews; follow-up questions were asked as needed. These questions were designed to determine the students’ overall impressions of the program, what participants gained from their experiences, and how they believed the programs might be improved.

For year-long programs, which included the GAP program and College First Program, post-participation interviews were conducted within two days of the completion of the program’s full-time summer component. For the Challenge, post-participation interviews were conducted on the final day of the program. For summer-
only programs, which included the CSS and Science First programs, the researcher conducted the post-participation interview within the last two days of the program.

Prior to the first interview at each site, a program staff member introduced the researcher to the program participants. The researcher conducted all interviews; with the exception of interpreters for the hearing impaired, program staff was not allowed into the interview spaces.

**Personal interviews with key administrative staff and educators**

The researcher gathered data from program staff using personal interviews that were conducted during case study visits. Interview subjects (Appendix H, pg. 97) were selected for their experience with and knowledge of each program. The number of subjects interviewed at each institution varied according to the saturation and distribution of program knowledge within the organization. Personal interviews were conducted until the researcher determined that data saturation was achieved.

**Site exposure**

The researcher spent at least two full days at each location during each case study visit. A total of five days was spent at BBG and CBG. Three days were spent at FTBG, and 12 days at DNS. While onsite, the researcher conducted interviews; observed various program activities; and engaged in conversations with program staff, garden staff and volunteers. Due to human subject concerns, communications between the researcher and students were limited to casual conversations initiated primarily by participants.
Questionnaire

A questionnaire was distributed to each of the four case research sites. This tool was designed by the researcher to collect administrative program information. Responses to this questionnaire are presented in tables two, three, and four within Appendix E, pg. 89.

Research design and guiding principles

The design for this thesis research was based on qualitative methods presented in McMillan’s (2004) text, “Educational Research: Fundamentals for the consumer.” The format for this document is inspired by Mathews’s (2005) article, “Crafting qualitative research articles on marriages and families.”

Table 1: Characteristics of the 2005 participants of the Chicago Botanic Garden’s Garden Apprentice Program (GAP), Delaware Nature Society’s Christina Science Scholars (CSS) program, Chicago Botanic Garden’s Science First and College First programs, and Fairchild Tropical Botanic Garden’s Fairchild Challenge (the Challenge) program
Chapter 3

FINDINGS

Ten teenager expectations emerged from data analysis. These expectations are divided into two categories. The “majority perspectives” were expressed and/or agreed upon by more than half of the teenagers at three or four of the case study sites. The “outlying perspectives” were expressed and/or agreed upon by fewer than half of the teenagers at two or more of the four case study sites.

**Majority perspectives**

- To be given choices
- To be empowered to move toward self-sufficiency
- To meet new people
- To have fun and/or new learning experiences
- To belong

**Outlying perspectives**

- To interact with technology
- To relax in a peaceful environment
- To learn about growing plants as food
- To compete for recognition
- To be led by the appropriate individuals
Many of the quotations in this chapter reflect the teenage vernacular, which often lacked precision, but seldom lacked emotion or intent. Because short answers were common, a portion of these findings has been translated from the vernacular or derived from short answers. Direct quotations are only provided when a single, concise quotation could be found that exemplifies the themes presented in each category. Examples are provided where programs seem to have been effective in meeting the needs presented in each category, and onsite observations are also noted, where appropriate.

**Majority perspectives**

*Expressed and/or agreed upon by more than half of the teenagers at three or four case study sites*

**Teenagers want to be given choices**

More than half of the focus group participants at the Brooklyn Botanic Garden (BBG), Chicago Botanic Garden (CBG), and Delaware Nature Society (DNS) agreed they would like to be given opportunities to make choices surrounding their experiences and schedules.

**Choices of experiences**

I would have more options to do different things, because we seem to do the same things every day. (Garden Apprentice Program, focus group interview, August 2005)

You need to offer a lot more variety of choices, to appeal to what people want to do, like playing in the water, or plants. Some people like plants, some people like water, so if you give them enough options [sic]. You need to ask us what we are interested in and get us involved in that. (College First, focus group interview, July 2005)
I would like more options, kind of like a free day, or to have different counselors do different things, they could take different groups. Like one counselor could stay inside and just play different games, or hang out; another group could go hiking; another group could go down to the creek. So, everybody could do something they wanted to do. (Christina Science Scholars, focus group interview, June 2005)

The Fairchild Challenge (the Challenge) is an example of a program that responds to teenagers’ desires for choices. The Challenge presents middle and high school participants with several competition categories and the participants may elect to compete in as many of these categories as they desire. Options range from the academic to the artistic, spanning a broad diversity of teenagers’ interests. In order to further accommodate these interests, the Fairchild Tropical Botanic Garden (FTBG) varies these categories annually based in part on recommendations from past participants.

CBG and DNS provide participants with choices surrounding group research projects. Science First, College First, and Christina Science Scholars (CSS) participants are provided with broad areas of subject matter, and then given the freedom to select a specific topic, design an experiment, conduct research, and present their findings. While participants at these two organizations expressed gratitude for the choices afforded them, several suggested that their project experiences could be enhanced if they were provided with additional choices and opportunities including: selecting projects from an even broader array of topics, incorporating their personal interests into their research and presentations, gaining access to a broader spectrum of scientific technology, and using audio-video technology in their presentations.

As part of the Garden Apprentice Program (GAP), “tier one” participants are afforded opportunities to choose from among a range of plant-related subjects, a specific topic area they wish to be certified to teach via the BBG’s Discovery Cart
program. These Discovery Carts are portable education stations that may be transported and set up within the Garden. The carts are equipped with teaching materials that participants use to convey information to visitors. Through the GAP, participants are provided with the additional option of selecting new subject matter and designing a Discovery Cart of their own. GAP participants were excited about the opportunity to teach visitors but were apprehensive about being formally tested during the certification process.

Speaking for the CSS program, Joe Sebastiani, Members Program Coordinator at DNS stresses the importance of teenagers owning their experience:

[It is important to] provide teenagers with things to latch onto and get excited about and give them experiences that they can own for themselves. (J. Sebastiani, personal communication, June 2005)

Speaking of the GAP program, Marilyn Smith, Director of Children and Family Programs at BBG echoed these sentiments:

It is important to make [teenagers] feel like they are active contributors to what is happening. (M. Smith, personal communication, June 2005)

**Customization of schedule**

At BBG, CBG, and DNS, teenagers proclaiming themselves to be “morning people” consistently argued with their late-rising peers over the topic of scheduling. The topic of program timing experienced much debate during this research, with teenagers weighing in on all sides of the issue including one extreme case at DNS:

There were two girls that quit because they simply couldn’t get up that early in the morning, because it’s an hour earlier that you have to get up for school and some kids couldn’t do that. (Christina Science Scholars, focus group interview, July 2005)
A vocal minority at DNS and CBG (including some non-“morning people”) preferred an early schedule because it allowed them to spend more time in the late afternoon socializing with friends or participating in other recreational activities. “Sleep-needy” students at BBG, CBG, and DNS strongly advocated an afternoon program, while one “morning person” at DNS noted:

I like waking up really early because it’s always quiet, and I like going places in the morning that I can’t go to at night. (Christina Science Scholars, focus group interview, July 2005)

While many preferences were expressed, and motivations espoused, more than half of the participants at BBG, CBG, and DNS agreed that a flexible schedule was a desirable solution to their concerns.

While none of the programs in this study employed a flexible schedule, other methods were used to accommodate some of the concerns surrounding energy levels and weather concerns. To accommodate later-risers, BBG and DNS employ early-morning, high-energy exercises. As one teenager noted:

We do ice-breakers in the morning, and that pumps you up. (Garden Apprentice Program, focus group interview, August 2005)

At CBG, Science First instructors accommodate fluctuating teenage energy levels by providing a variety of activities including games, outdoor activities, and project work. When necessary, lectures are brief and high energy, with the two instructors taking turns presenting.

Team teaching helps keep kids attention. Some studies show that adolescents have a fifteen minute attention span, so if we need to have a discussion, lecture, for thirty minutes, we can split it up half and half, so a least they get fifteen minutes of one guy and fifteen minutes of another guy. You have to keep them guessing a little. (K. Yee, personal communication, July 21, 2005)
Teenagers want to be empowered to move toward self-sufficiency

More than half of the focus group participants at BBG, CBG, and DNS expressed that their program participation was inspired by a desire to prepare for adult experiences, including college, future careers, and financial independence.

Career and college preparation

More than half of the focus group participants at BBG, CBG, DNS, and FTBG agreed that their respective programs were a desirable means of preparing for college or a future career.

[The GAP program] can attract people who are interested in going to college. High school kids can use it to gain experience for college. It’s good to put down on your application. It is a good source of recommendations. (Garden Apprentice Program, focus group interview, July 2005)

The Science First program for me was something that could go onto my record for schools that I want to go to, because I am trying to get a scholarship for high school and college and I thought this was something good to put on my resume. (Science First, focus group interview, July 2005)

It’s going to benefit you in the long run. (Christina Science Scholars, focus group interview, June 2005)

Public gardens such as BBG and CBG have responded to teenagers’ needs for career development by incorporating college and employment preparation into the hearts of the GAP and College First programs. This preparation is comprehensive and includes formal training in resume writing, teambuilding workshops, and lectures on professional behavior. GAP and College First participants are also familiarized with interview processes and performance evaluations. As teenagers participate in GAP and College First, they become absorbed into environment in which their attendances are monitored, their competencies evaluated, and their efforts compensated.
Following participation in these two programs, participants expressed a greater appreciation of the working world and for the employment experience they gained.

[When] you are around people that are friendly about working in the Garden, and they support each other, and they are upbeat about the job, it [helps] you do your job better. (Garden Apprentice Program, focus group interview, June 2005)

This is like the real world. It’s like a real job. You really have to hold your own, to make it right. (College First, focus group interview, July 2005)

At CBG, College First students participate in weekly field trips to local colleges and are provided with opportunities to tour campuses and meet with professors and students. Program participants agreed that the most valuable aspects of these college visits were those times when they spoke about the realities of college life with “actual college students.”

Some colleges we just kind of toured, but in some of them they took us in and they sat us down. They knew that we were juniors and seniors and they told us what college in general was about, not just about that particular school. That’s where I learned the most! (College First, focus group interview, May 2005).

Compensation

More than half of the teenagers at BBG, CBG, and DNS agreed that compensation was an important incentive for participation in their respective programs. At BBG and CBG, the compensation received was financial.

The money is important. It just is. (Garden Apprentice Program, focus group interview, June 2005)

This program pays more than all the other ones, and they don’t tell you that. It pays more than the planetarium. (College First, focus group interview, July 2005)
It’s all about the paycheck! (College First, focus group interview, August 2005)

BBG attracts young teenagers into tier one of the GAP with the incentive of providing training that will elevate them along a four tier system that leads to paid employment.

I thought that it would turn out to be valuable [because] it turned out to be a real paying job later on. (Garden Apprentice Program, focus group interview, July 2005)

Similarly, CBG provides participants of Science First, their unpaid middle school program, with the skills and work ethic necessary for admittance to the College First program, which offers paid employment.

I came to the Science First program because I wanted to learn enough to do the College First program and get paid. (Science First, focus group interview, July 2005)

At DNS, more than half of the participants of the CSS programs cited the importance of the high school credit they would receive as the result of program participation. This credit was perceived by the participants to be a form of compensation.

What kept me coming was the high school credit. (Christina Science Scholars, focus group interview, July 2005)

Getting the extra credit for high school really kept me going. (Christina Science Scholars, focus group interview, July 2005)

The high school credit is pretty hard to pass up. (Christina Science Scholars, focus group interview, June 2005)

I did it for the credit. (Christina Science Scholars, focus group interview, June 2005)
When asked if they would exchange their high school credit for financial compensation, more than half of the teenagers at DNS responded “yes.” For the remaining teenagers, the incentive of receiving this credit was sufficient.

I wouldn’t give my credit up because it is going to help me out in high school, and you need twenty-four credits to graduate. (Christina Science Scholars, focus group interview, July 2005)

When informed of the credit system at DNS, one Science First participant responded:

High school credit lasts a bit longer than the money, ‘cause when you get the money you are going to run to the mall or something and that’ll be gone. The credit will last. (Science First, focus group interview, July 2005)

This perspective is explained by Helen Fischel, Associate Director of Education at DNS:

High schools have become much more academic, so I think that everybody is looking at [Advanced Placement Exams] and how many college credits you are going to leave high school with, if you are going to college, or even if you’re not… Students want to see how many credits they have earned. (H. Fischel, personal communication, June 2005)

While middle school students at CBG did not receive high school credit, more than half of the participants expressed that they were motivated to participate in the Science First program by the perceived opportunity to build resumes and gain recommendations for selective high schools and colleges.

The Science First program for me was something that could go onto my record for schools that I want to go to, because I am trying to get a scholarship for high school and college and I thought this was something good to put on my resume. (Science First, focus group interview, July 2005)
I wanted to do something good that would go on my resume. (Science First, focus group interview, July 2005)

This was important to build my resume for college. (Science First, focus group interview, July 2005)

In contrast to the other programs studied, The Fairchild Challenge provides no guarantee of financial compensation. While a financial award is provided to the highest performing schools, this incentive was not cited by participants as being a contributing factor for participation in the Challenge.

**Teenagers want to be provided with opportunities to meet new people**

More than half of the teenagers at BBG, CBG, DNS, and FTBG expressed an appreciation for the opportunities to meet new people, especially new friends.

I kept coming because it was a lot of fun, and I met a lot of new friends. (Garden Apprentice Program, focus group interview, August 2005)

The friendships we made were so important. (College First, focus group interview, August 2005)

I came here to have fun and develop friendships, meet new people. (Christina Science Scholars, focus group interview, June 2005)

It ended up being really fun because I got to meet people that I didn’t know existed at our school. (Fairchild Challenge, focus group interview, May 2005)

The chance to spend time with new friends was frequently expressed to be the best part of the teenagers’ program experiences. When asked how to better serve teenagers through public garden programs, students in all four programs responded with some variation of, “provide more opportunities for socializing with friends.”

The social aspect of these programs was also noted by Sadara Sangameswaram, former coordinator of the Science First and College First programs:
There is a whole social thing going on… very early on they make friends and then they form their groups. And, I think that a lot of the repeat experiences, the students that come back, want to be in the same program with their friends and they want to coordinate and make sure they are in the same sections with their friends, so there is a definite social component to this. (S. Sangameswaram, personal communication, July 2005)

Nicole Patel, Coordinator of Secondary Education Programs at CBG, describes how the Science First and College First program curricula accommodate teenagers’ needs for socialization:

It is important when running an academic program in the summer to allow the students to socialize… the program achieves this goal through playing games and doing lots of team building exercises. The instructors give them a lot of down time. (N. Patel, personal communication, July 2005)

In keeping with this perspective, Ted Macklin, former Manager of Children’s Garden and Exhibits at BBG notes:

Building the social part of the program into the program itself is key… when anyone learns anything, the education they get is based on… the experience they are having in the moment, and it’s based on the social environment that they are in while they are having the experience. (T. Macklin, personal communication, June 2005)

BBG, CBG, and DNS have responded to teenagers’ need for social experiences by integrating team building exercises into their curricula. In spite of the prevalence of team building exercises within the Science First and GAP curricula, more than half of the teenagers at CBG and DNS agreed that in the absence of sufficient social opportunities, teenagers will socialize at the expense of their prescribed program activities. During an interview at DNS, the entire group rallied in support of one student when she said:

We’re going to socialize anyway, so you may as well give us free time to hang out rather than having us goof off when we’re supposed to be
When asked if they had enough time to socialize, one College First student responded:

Yes, but not when we were supposed to be. If they gave us more time to socialize, we wouldn’t goof off so much. (College First, focus group interview, July 2005)

This individual’s sentiments were unanimously supported by his peers.

**Teenagers want to have fun and/or new learning experiences**

More than half of the focus group participants at BBG, CBG, DNS, and FTBG agreed on the importance of fun and/or new learning experiences.

**Fun while learning**

All of the focus group participants at BBG, CBG, DNS, and FTBG agreed on the importance of having fun while learning.

There is so much to learn here. You just leave the house and come out into the outdoors and have fun learning. (Garden Apprentice Program, focus group interview, June 2005)

Our counselors make you want to learn about science. They add fun to it. (Science First, focus group interview, July 2005)

If it’s not fun, I’m not going to learn anything! (Christina Science Scholars, focus group interview, June 2005)

The best way to grow [is] having fun and then walking out of it with an unexpected knowledge. (Fairchild Challenge, focus group interview, May 2005)

GAP participants rallied in support of the following statement:

What I find interesting is that we learn stuff here and then we go teach it and interact with the visitors here and we interact with them and they learn something and sometimes they tell you stuff that you didn’t
know, and you learn from them. (Garden Apprentice Program, focus group interview, August 2005)

For one student at BBG, the act of simply learning new things appeared to be a fun experience in itself:

I kept coming because overall it’s really fun, you learn things everyday. For me, that’s important, learning things every single day (Garden Apprentice Program, focus group interview, August 2005)

This concept is well illustrated by Science First Instructor, David Cooper:

They have to enjoy learning, and if you give them self-confidence and make them feel good and want to learn more, that’s the point of education. (D. Cooper, personal communication, July 2005)

New experiences

When you are here, you are working with new kids all the time and you’re learning something new, and it’s a new experience! (Christina Science Scholars, focus group interview, July 2005)

The desire to engage in new experiences was cited as a motivating factor to participation by more than half of the teenagers at BBG, CBG, DNS, and FTBG. This relationship with “newness” was prevalent in the language teenagers used to describe their experiences at each of the four study sites.

I have never been to a botanic garden so this is a totally new experience for me. (Garden Apprentice Program, focus group interview, June 2005)

Teens are fascinated with everything, just expose us to something new, and chances are one of us will eat it up. (Garden Apprentice Program, focus group interview, August 2005)

You have a new experience every day that you come. (Science First, focus group interview, July 2005)

It has to be new and interesting every day! (Christina Science Scholars, focus group interview, June 2005)
[You learn] new things. You learn yourself by just doing it, seeing butterflies, what they are attracted to, and what they need in their environment. So I think that it’s something interesting that anyone can learn about. (Fairchild Challenge, focus group interview, May 2005).

Administrators at DNS and FTBG expressed the importance of offering new experiences to teenagers.

The types of activities we were doing outdoors with the kids, in a hands-on way, where they can see stuff for the first time, experience things for the first time… that’s the kind of things that kids get really excited about; that’s the kind of thing they will remember for their whole lives. (J. Sebastiani, personal communication, June 2005)

Teenagers are information rich but experience poor… providing teenagers with new experiences is important to their growth and development not just as students, but as human beings. (H. Fischel, personal communication, June 2005)

[The Fairchild Challenge] appeals to them because it is different from what they normally do. (B. Michaels, personal communication, April 2005)

DNS achieves a sense of newness by encouraging CSS participants to explore natural landscapes. Students at DNS expressed an appreciation for outdoor activities including hiking, wading through streams, capturing frogs and mammals, and interacting with other aspects of nature.

What kept me coming was that everyday I got to do something new. Some days we’d go on a field trip, and sometimes we went outside and explore, so every week it was something different. (Christina Science Scholars, focus group interview, July 2005)

My favorite part was doing a lot of outside stuff, like looking at trees and animals. I didn’t know a lot about nature, so everything was new and exciting. (Christina Science Scholars, focus group interview, June 2005)

At CBG, Science First students celebrated the opportunity to engage in new experiences. This concept is well expressed by one teenager who said:
My favorite part was going in the river. I didn’t think that I was going to walk in the river or the lagoon, but I did it! (Science First, focus group interview, July 2005)

BBG, CBG, and FTBG’s curricula offer new experiences extending beyond the exploration of new environments. At BBG and CBG, students participate in a diversity of internship opportunities that offer teenagers first time experiences including horticulture, botany, teaching, visitor services, and library management. At FTBG, students were introduced to new experiences such as designing sustainable buildings, constructing solar cookers, and filming public service announcements.

**Teaching**

More than half of the teenagers at BBG, CBG and FTBG agreed that the teaching opportunities provided by their respective programs were important aspects of their program experiences.

I like working with the kids. Talking about ideas, and giving them knowledge. (Garden Apprentice Program, focus group interview, June 2005)

I liked teaching the little kids. It made me feel more confident. (College First, focus group interview, August 2005)

I enjoyed learning about the environment and then teaching it to my family. Like what to do and what not to do, what to buy and what not to buy. I felt like an expert. That felt good. (Fairchild Challenge, focus group interview, May 2005)

BBG, CBG, and DNS have responded to teenagers’ interests in teaching by encouraging older teenagers to assume mentoring responsibilities. BBG and CBG use a teen employment structure that enables high school aged teenagers to teach and lead younger peers. Select teenagers at these three institutions interview for and are hired as assistants to the programs in which they had previously participated. At
BBG, “tier four” apprentices are paid to mentor “tier one” students, who in turn expressed their gratitude for the opportunity to teach visitors through the aforementioned Discovery Cart program.

It’s nice that you’re teaching other people, and at the same time you’re learning from them. (Garden Apprentice Program, focus group interview, August 2005)

Gardens have also provided opportunities for teenagers to take on the responsibility of teaching younger children. Perhaps the most intensive example of this system is found at BBG, where high school juniors and seniors in the GAP program are entrusted with programming responsibilities for BBG’s Children’s Garden. Speaking of her experience teaching at the Garden, a “tier four” apprentice expressed:

My favorite part of the program is teaching the kids, and actually teaching. Being in this program makes you feel like you’ve made a difference. You learn while you’re teaching. It really makes you feel really happy about yourself, knowing that you have information to share, and that people want what you have. (Garden Apprentice Program, focus group interview, July 2005)

This teenager’s sentiments were enthusiastically supported by her peers.

A similar, though less-involved teaching experience is provided through the College First program. During their eight weeks at CBG, teenagers take on internships with the Garden’s children’s camp programs and are trained to care for small children.

**Hands-on activities**

More than half of the focus group participants at BBG, CBG, DNS, and FTBG agreed upon the appeal of hands-on learning activities.
Games and activities, like learning activities, work and games mixed together, makes it more interesting for me. And, it makes me want to learn it more than just sitting in a classroom. (Garden Apprentice Program, focus group interview, August 2005)

I liked looking at the water lilies, and finding out they have this wax substance they keeps them from getting wet, even on a rainy day. It was fun because it was hands-on. I got to touch the plants, not just look at a picture. (Science First, focus group interview, July 2005)

I like when [I] learn about things that are actually in front of me! (Christina Science Scholars program, focus group interview, July 2005)

It’s more hands-on, instead of researching. But even though you’re not actually going to the computer and learning new things, you learn yourself by just doing it, seeing butterflies, what they are attracted to and what they need in their environment. (Fairchild Challenge, focus group interview, May 2005)

At BBG, the entire focus group rallied around one participant when he expressed the value of hands-on activities:

It is easier to grasp information when you are having fun. You are not just sitting here reading out of a text book, you are doing things that are hands-on that make you remember it. (Garden Apprentice Program, focus group interview, July 2005)

BBG accommodates hands-on learning needs through activities such as scavenger huts, and the Discovery Cart program.

At CBG, more than half of the Science First participants reached consensus on the value of the “sensory garden”:

I liked… visiting the sensory garden, where we got to actually feel and smell everything. There was this one flower that smelled like fish. One smelled like chocolate, another smelled like strawberry blow pops. (Science First, focus group interview, July 2005)

Science First students also participate in environmentally-themed games.

Whenever we play games we try to connect ecological values to these games, such as predator and prey, and we’ll debrief during the game
i.e. we’ll mention that they are acting like a pack, or a school or fish, etc. There always has to be a reason behind everything we do. (D. Cooper, personal communication, July 2005)

To address hands-on learning interests, DNS brings teenagers to natural areas and introduces them to new environments through interactive activities. Teenagers at DNS expressed an enjoyment in learning how to field-identify reptiles, stream-borne insect larvae, birds, and trees. More than half of the CSS participants agreed that the canoeing trips were an exciting, hands-on program experience.

The value of hands-on learning at DNS was expressed by Members Program Coordinator, Joe Sebastiani:

We want them to learn by doing and experiencing, and not even know that they are learning, and being excited by something, and after a couple of weeks of that, hopefully they would be doing this stuff on their own [and] thinking this is fun. (J. Sebastiani, personal communication, July 2005)

**Teenagers want to belong**

More than half of the teenagers at BBG, CBG, DNS, and FTBG expressed a strong awareness of their social environment. This awareness manifested itself in heightened emotional responses to topics surrounding public and private belonging.

**Public belonging/Popularity**

All of the focus group participants at BBG, CBG, DNS and FTBG either expressed or agreed that teenagers are especially aware of the effects of wearing the wrong outfit, hanging out with the wrong people, saying the wrong thing, or expressing interest in an unpopular subject.

You have to deal with peer pressure at school, worrying about what’s the latest clothes to wear, and shoes. Are you popular and all that stuff?! (College First, focus group interview, July 2005)
There’s a stereotype for people that like science, like I stay after school working on this project, and people will call me a nerd. They need to take this stereotyping off science, you know, and make it more a cool thing. (Fairchild Challenge, focus group interview, May 2005)

It’s a lot pressure being a teenager, to be popular, to be with the in crowd and what not, and if you’re smart then you’re a nerd, like if you get A’s, that’s not cool. (Christina Science Scholars, focus group interview, July 2005)

It was apparent to the researcher and to staff at CBG that each group of teenagers contained traditionally popular and unpopular students. The inherent potential for emotional conflict in teen programs was implied by Nicole Patel, Coordinator of Secondary Education Programs at CBG:

One kid is proud of being a nerd, but not every kid shares his philosophy on that. (N. Patel, personal communication, July 2005)

Gardens have sought to neutralize social stereotyping in part by building community. Through team exercises and group activities, BBG seems to have helped bridge the popularity gap.

Once we have that group of people, the training they go through is really intense… it’s a three-week training, five days-a-week, six hours-a-day, for three straight weeks. And that training is to help build them as a cohesive group, more than to pour knowledge into their heads. They start functioning together as a team. They support each other in their future learning. They support each other in maintaining their commitment to the Garden and once they get that bonding out of the way, that social piece out of the way, then they start building their leadership skills, their public speaking skills, and gaining all of the pieces of knowledge they are going to share with whoever comes here. (T. Macklin, personal communication, June 2005)

At CBG, Science First instructors Kavan Yee and David Cooper used a highly personal approach to break down social popularity lines:

One way to connect with middle school kids is, you have to be dorky, you have to, because these kids are all dorks, and no matter how cool they think they are, they feel awkward in some way, physically,
emotionally, and a lot of them are looking to be cool, responsible, adults, and at the same time they are looking for guidance and mentorship, and not necessarily their parents, because that’s not cool. So, if they can connect with someone like Dave or myself in some way, that is important. Dave likes hip-hop, so these kids connect with him there. I’m just an idiot, and Dave makes fun of me a lot, and I make fun of myself, and they see that we’re human beings, we’re not this stoic figure up-front writing notes. (K. Yee, personal communication, July 2005)

Caroline Lewis, Director of Education at FTBG, cites drawing a large number of participants together as an effective means of neutralizing social concerns:

Working together makes it socially acceptable. (C. Lewis, personal communication, April 2005)

Helen Fischel, Associate Director of Education at DNS, sought to alleviate the stereotype that science is not “cool” by incorporating high school students as mentors in their CSS program.

There are peer instructors so students can see that it’s okay to be smart and like science and the natural world. (H. Fischel, personal communication, June 2005)

Personal belonging

More than half of the case study participants at BBG, CBG, and FTBG agreed upon the value of feeling part of something important or beautiful.

Students at BBG and CBG referred to the relationships they developed during the program as a type of family:

I kept coming back because I got attached to the people I met here, they started to become like family. (Garden Apprentice Program, focus group interview, August 2005)

The new friends that I made were interesting and it was fun being with them for four weeks, seeing what they were into it, what they like, how well we get along with them; it was like having a new family. (Science First, focus group interview, July 2005)
At FTBG, one middle school participant expressed:

Being involved in this project, and in this garden made me feel special, like I belonged to something big and important. (Fairchild Challenge, focus group interview, May 2005)

This comment was unanimously supported.

Ted Macklin, former Manager of Children’s Garden and Exhibits, explained how the GAP aspires to build community:

Any program that would be successful working with teenagers, in some aspects, is about building a community of practice, and within that community of practice the youth that are in the program support each other and their families support them and we support them. (T. Macklin, personal communication, June 2005)

Marilyn Smith, Director of Children and Family Programs at BBG, commented on how teenagers perceive their connection to the organization:

Being part of the Garden is important to them, ‘they’ll be working at the Garden.’ That’s a big thing for them… to be in the inside…they get a staff ID, they get a uniform shirt. (M. Smith, personal communication, June 2005)

**Outlying perspectives**

*Expressed and/or agreed upon by fewer than half of the teenagers at two or more case study sites*

**Teenagers want opportunities to interact with technology**

Three focus group participants at CBG and two focus group participants at DNS expressed that their program experiences could be improved by incorporating more technology into the curricula.

Think about it, you know, we could use our phones to take pictures for a project or something. (College First, focus group interview, August 2005)
It would be cool if we could find some way to incorporate video games into the program, like a watershed video game or something. (Christina Science Scholars, focus group interview, July 2005)

Science First instructor, Kavan Yee, described the importance of using technology to support programs for teenagers:

It is important to stay computer savvy and technology savvy because of all the video games these kids play. These kids make Power Points just like that! They are so good with computers… The majority of the kids are so stimulated by all the technology that I’ve tried to incorporate as much as I can… doing Power Points and incorporating video into the presentations. (K. Yee, personal communication, July 2005)

Administrators at each of the four case research sites expressed an awareness of teenagers’ predilections for technology and yet few instances were observed where technology was used to support curricula. Additionally, program regulations at BBG, CBG, and DNS limited teenagers’ uses of cell phones, music players, and other portable devices. This denial of or lack of access to technology appeared to be resented by teenagers throughout this research.

Where technology was integrated into programs, it was met with great appreciation by the students. One CSS student took it upon himself to seek out DNS’ video-camera, and, to the awe and excitement of his peers, he integrated video clips into his research presentation.

I wanted this to be a surprise tonight during parents’ night, but, we’re actually making a movie using Windows Movie Maker, so that’s why we liked our project because of the special effects and stuff. (Christina Science Scholars, focus group interview, July 2005)

Three teenagers at DNS excitedly recalled using telemetry equipment to track box turtles across natural areas. College First participants demonstrated an interest in digital photography by inserting an abundance of candid images into research presentations. Teenagers at FTBG demonstrated an affinity for filming
public service announcements and shooting digital photographs as part of the Challenge competition.

**Teenagers want opportunities to relax in a peaceful environment**

The topic of down-time was broached by teenagers at CBG and DNS, fewer than half of which agreed upon the importance of providing more opportunities to interact with the environment in a relaxed setting. At least one teenager at each BBG, CBG, DNS, and FTBG described his/her surroundings as desirable in being beautiful and/or safe.

The Garden, it’s so beautiful and it made me want to be here every day. It’s beautiful. (Garden Apprentice Program, focus group interview, June 2005)

When Science First participants at CBG were asked to vocalize their favorite places in the garden, their responses were instantaneous. Closing her eyes, one girl expressed:

I remember when we went to Spider Island, this little isolated place where you could just sit and read. (Science First, focus group interview, July 2005)

When asked how she might improve her GAP experience, one girl responded:

I would make a trail that you could walk on that you could be completely alone, peaceful. (Garden Apprentice Program, focus group interview, August 2005)

At FTBG, one student indicated that relaxing among the Garden’s many lagoons was her favorite part of the Challenge.
Teenagers want to learn about growing plants as food

Three teenagers at each BBG and CBG expressed a fascination with growing plants for food. As expressed by one GAP participant:

My favorite part is when you get to cook… last summer we made pizza from the tomatoes and basil that we grew in the gardens. (Garden Apprentice Program, Focus group Interview, June 2005)

These sentiments were supported by fewer than half of the teenagers in this focus group.

Three College First participants at CBG were fascinated by a visit to the Green Youth Farm:

The Green Youth Farm grows their own food, and then they go and cook with professional cooks… what they did was grow everything from seeds and they took care of it. They did everything themselves. They got to grow it, sell it, and then cook with it! (College First, focus group interview, August 2005)

The attractiveness of agriculture was debated by focus group participants during a lengthy discussion that followed this teenager’s comment; consensus was not reached on this topic.

Teenagers want to compete for recognition

While the concept of recognition surfaced during focus group interviews at BBG, CBG, DNS, and FTBG, consensus was never achieved on its importance. These discussions spanned topics extending from winning competitions to being recognized for special talents.

At DNS, when discussing the topic of games one student responded:

We had something like a contest earlier, but we didn’t win anything so that was a let down. (Christina Science Scholars, focus group interview, July 2005)
This comment was followed by a murmur of indecision. Seemingly, there was disagreement among these teenagers relating to the topic of competition.

At CBG, while eleven College First participants debated whether or not they even wanted to receive a certificate of participation, the twelfth proclaimed:

I think that they need to have more time dedicated to some kind of competition. It would be more fun if it were a game. Make every activity we do interesting, but make it competitive. (College First, focus group interview, July 2005)

Three middle school students at Fairchild agreed that the best part of participating in the Challenge was receiving personal invitations to the awards ceremony:

My favorite part was getting an invitation… the invitation made me feel so important (Fairchild Challenge, focus group interview, April 2005)

Each of these same teenagers concluded, however, that winning is also important. A high school participant of the Challenge asserted:

Winning is the only thing that matters! (Fairchild Challenge, focus group interview, May 2005)

When asked to explain his statement he responded:

It's just the high school spirit, I’m sorry, but that’s the way we are. (Fairchild Challenge, focus group interview, May 2005)

Teenagers want to be led by the appropriate individuals

Teenagers throughout this research were vocal about the adult and peer mentors in the care of whom they where often placed. Because there were no predetermined interview questions surrounding instructors, supervisors, or mentors, any comments received by participants resulted spontaneously from other questions, and consensus was never achieved. The following characteristics were assembled
from the following individual teen and adult perspectives on the qualities teenagers might look for in their program leaders.

**Leaders should be invested**

They have to like the job. We’re teenagers and even though we are getting paid, we did volunteer to get involved. We have a right to complain. But when they complain all the time it seems like they don’t like the job. Why are they here if they are going to be that way?!
(College First, focus group interview, August 2005)

You need to have people that love kids and are comfortable around kids, and take them serious. When people take me seriously, then I get serious about what I’m doing. If you treat me like a kid, I’m going to act like a kid.
(Garden Apprentice Program, focus group interview, August 2005)

**Leaders should be honest and respectful**

You can’t talk down to the students. You have to come with respect and not try to trick them into thinking that [your program] is something they want to participate in, but actually make the case that it is. (D. Whitman, personal communication, April 2005)

Teenagers can sense everything. They can sense your presence. They can assess what you feel, what you think, and they will call you out on it if they think you are not sincere. (N. Cayemitte, personal communication, August 2005)

**Leaders should be driven toward fellowship**

I’d like to see the instructors actually work with us, cause’ they were kind of working above us… That’s how they become more of a friend, more of a peer, by actually going through what you’re going through, rather than an authority figure. (College First, focus group interview, August 2005)
Leaders should be patient and flexible

You have to have patience with teenagers. Teenagers have a quick temper and some teenagers take a while to figure things out. You need to give them the time to figure things out. Don’t get on top of them all the time! Give them some room to breathe. (Garden Apprentice Program, focus group interview, August 2005)

You can’t have uptight instructors, always like, ‘you, don’t do this,’ or ‘you, don’t do that.’ They don’t always have to be so strict. (College First, focus group interview, August 2005)

[You need] someone who is flexible, because there is a lot of stuff that changes and you can’t be snappy when something is not quite what you expect. (College First, focus group interview, August 2005)

Leaders should be experienced with teaching teenagers

If you’re getting paid to teach, then teach. When we ask them a question, they look at us like we are stupid, like we should know it already. (College First, focus group interview, August 2005)

You need a good teacher, someone who isn’t boring. Who shows us plants, like Venus fly traps, [someone] who does lots of labs, who takes us places, shows us things, and asks us a lot of questions. (Garden Apprentice Program, focus group interview, August 2005)

Leaders should be supportive

I don’t have prejudgments, I just have hope. And I let them know that I support them 100%, and I want them to know that they are supported. (N. Cayemitte, personal communication, August 2005)

Leaders should be youthful

I thought that it was really cool that we have senior apprentices be our counselors, helping out the coordinator. It kind of inspires ‘yeah, that’s something I would want to do one day’ just looking what they do, and how they help us. (Garden Apprentice Program, focus group interview, July 2005)
Not to be ageist [sic], but I think it does help if you have younger teachers. I’m being very candid with you, we’ve tried both, but I think it works better to have teachers that are more at their level, even if that person doesn’t have as much experience, you are better off. I can’t explain to you why, but that’s the way I observed it. (S. Sangameswaram, personal communication, July 2005)

Having two peer assistants is the key… they can give advice to the kids… they are on the bus with the kids, at lunch they can sit with the kids and it’s not like sitting with the teacher. (D. Cooper, personal communication, July 2005)
Chapter 4

DISCUSSION

**Summary of findings**

Research findings indicate that participants of the Garden Apprentice Program (GAP), College First and Science First programs, Christina Science Scholars program (CSS), and the Fairchild Challenge (the Challenge) had certain expectations of their program experiences. These expectations were presented at two levels of frequency. The “majority perspectives” were expressed and/or agreed upon by more than half of the teenagers at three or four of the case study sites. The “outlying perspectives” were expressed and/or agreed upon by fewer than half of the teenagers at two or more of the case study sites.

The majority perspectives suggest that teenagers wish to be given choices surrounding their program experiences and schedules; to be empowered to move toward self-sufficiency either by career and college preparation and/or by receiving compensation for their program participation; to be provided with opportunities to meet new people; to have fun and/or new learning experiences through teaching and/or hands-on experiences; and to belong to the social and/or physical environments.

The outlying perspectives suggest that teenagers want opportunities to interact with technology; to relax in a peaceful environment; to learn about growing plants as food; to compete for recognition; and to be led by people who are invested,
honest and respectful, driven towards fellowship, patient, flexible, experienced with teaching teenagers, supportive, and youthful.

**Discussion**

Benson and Saito (2000) report that “the conceptual terrain for youth development is murky. There is no readily known and accessible literature; the work by definition is multidisciplinary, multilanguage and multisector” (pg. 136). In serving the more tangential of these disciplines and sectors, public garden researchers suffer from a lack of specific, comparable literature. This situation is exacerbated by “limited research documenting the reasons youth in general… choose to participate or not to participate in youth programs” (Perkins, Borden, Villarruel, Carlton-Hug, & Stone, 2005). These two conditions help explain the near absence of one of the five majority perspectives, as well as all five outlying perspectives from pertinent, available literature; the researcher has therefore chosen to omit these perspectives from the following discussion. Four of the five majority perspectives were, however, present in and supported by available literature and are therefore discussed in this section.

The following studies were found to report directly on the perspectives of teenagers participating, considering participation, or having participated in learning programs comparable to those addressed by this thesis research: the Carnegie Council on Adolescent Development, 1992 (as cited in Quinn, 1999); “Chicago Botanic Gardens: Science First remedial evaluation,” 2002; Hope, 2004; the National 4-H Impact Assessment Project, 2004; Lekies, Eames-Sheavly, Wong & Ceccarini, 2005; Brown, 2005; and Perkins et al., 2005. These seven studies lend support the following research findings.
Choice

This research found that more than half of the focus group participants at the Brooklyn Botanic Garden (BBG), Chicago Botanic Garden (CBG), and Delaware Nature Society (DNS) agreed that they would like to be given opportunities to make choices surrounding their experiences, schedules, and/or surroundings.

This finding is supported by Lekies et al.'s (2005) study of Cornell University’s “Children’s Garden Consultants” program (CGC). The CGC recruited seven teenage “consultants,” and charged them with the task of evaluating 20 children’s gardens and youth programs in the United States. Following their evaluations, these seven consultants recommended that in developing youth programs, public gardens should aspire to provide “a wide variety of programs” (pg. 15). While the motivations for this suggestion were not explored by Lekies et al., it is plausible that they were benevolent. It is therefore likely that these consultants believed that choices were important to future participants of the youth programs they were charged to evaluate.

In reporting on the combined perspectives of 21 policy makers, 66 practitioners, 27 researchers, and 22 youth, Brown (2005) lends further support to the importance of choice to the teenage audience (pg. 20). Brown’s study sought to identify commonalities among policy makers, practitioners, researchers, and youths’ concepts of what make a youth development program “successful.” Brown found that successful youth development programs “empower youth to make their own choices” (pg. 27), by providing “youth friendly environments” (pg. 26). These environments further support teenagers’ needs for choices by being “youth-initiated” and in representing a “youth agenda, not an adult agenda.” (pg. 26) Brown also reports that successful programs provide “meaningful youth input and buy-in at all levels
including planning, implementation, evaluation, decision making, overall goals, and participant recruitment” (pg. 26). Because this study considered teenagers’ perspectives on what makes youth development programs successful, it could be inferred that the teenage participants found choice to be an important, if not desirable, aspect of these programs.

The National 4-H Impact Assessment Project (NIAP) (2003) supports the value, and alludes to the potential desirability of decision-making opportunities to teenagers. This NAIP survey of 2,467 youth found that teenagers participating in nationwide 4-H programs expressed a benefit from being “included in big decisions” (pg. 9). Of the youth surveyed, 87% believed that 4-H “taught youth that they could make their own decisions” (pg. 9). Though this study does not specifically measure teenagers’ desire for making decisions, it shows that teenagers recognize the benefits of decision-making opportunities. This recognition suggests that these benefits may be important or perhaps even desirable to this audience.

**Self-sufficiency**

This research found that more than half of the focus group participants at BBG, CBG, and DNS expressed that their program participation was inspired by a desire to prepare for adult experiences, including college, future careers, and financial independence.

This finding is supported by the results of a CCAD (as cited in Quinn, 1999) study that sought to gain the perspectives of teenagers in Washington, D.C. and the surrounding area. Thorough a series of focus group interviews, the CCAD found that in considering participation in voluntary out-of-school experiences, teenagers wished to be provided with opportunities to “prepare for their futures” through
activities that “offered job experience, life skills training, and/or academic and
standardized testing preparation.” (pg 97) Though public garden-based learning
programs were not specifically mentioned as examples of voluntary out-of-school
experiences, they seemingly fit the implied criteria of being voluntary programs that
occur in the hours when school is not in session. It would therefore seem that the
results of this CCAD study may be applied in support of research findings.

Brown (2005) lends further support to the importance of self-sufficiency
to the teenage audience. This study found that successful youth development
programs provide “opportunities for skills development and a sense of mastery that
will aid in the transition to adulthood” (pg. 28). These environments further support
teenagers’ desires for self-sufficiency by providing “networking and career
opportunities” (pg. 26). Because this study reported teenagers’ perspectives on what
makes youth development programs successful, it could therefore be inferred that
teenagers found the preparation for adult experiences to be an important, if not
desirable, aspect of youth development programs.

In reporting on the perspectives of past teenage participants of the
support to teenagers’ desires to prepare for adult experiences. Hope found that ECO-
ACT participants believed the program prepared them for “future life decisions” and
“career choices” by facilitating “life lessons” and imparting “teaching and group
leadership skills.” (pg. 22) While this study does not speak to teenagers’ desires to be
prepared for future adult experiences, the fact that ECO-ACT participants identified
and reported the positive effects of the program, suggests that these effects were
important to them in some way, perhaps even desirable.
A study by the NIAP (2003) provides further support to the value, and alludes to the potential desirability, of self-sufficiency to teenagers. This study found that teenagers participating in nationwide 4-H programs believed that these programs “changed their lives” by encouraging the development of “knowledge and skills,” “well-being,” “responsibility,” “engagement,” and “leadership.” (pg. 10) While this study does not specifically address teenagers’ desires to acquire these positive, “life changing” qualities, the fact that teenagers identified and reported on these qualities suggests that these are important to them in some way, perhaps even desirable.

**New people**

This research found that more than half of the focus group participants at BBG, CBG, DNS, and FTBG expressed that they were motivated by the desire to meet new people.

Brown (2005) lends further support to the importance of meeting new people to the teenage audience. This study found that successful youth development programs provide “opportunities for young people to meet and collaborate with young people from similar organizations…” (pg. 27). Because this study considered teenagers’ perspectives on what makes youth development programs successful, it could therefore be inferred that teenagers find opportunities to meet new people to be an important, if not desirable, aspect of these programs.

Hope (2004) lends further support to the importance of new friends to teenagers. This study reports that ECO-ACT participants believed the program facilitated “lasting relationships” (pg. 15). Participants also expressed appreciation for the opportunity ECO-ACT provided for them “to interact with their peers from other schools” (pg. 27). Though this study did not specifically measure teenagers’ desire to
build these relationships, it shows that teenagers’ benefited from this aspect of the ECO-ACT program. By expressing this benefit, it could be inferred that lasting relationships as well as opportunities to interact with new peers are important to teenagers, perhaps even desirable.

A study by the NIAP (2003) further supports the value and alludes to the potential desirability of meeting new people to teenagers. This study found that teenagers participating in nationwide 4-H programs enjoyed “meeting new people and making friends” (pg. 8). Though this study does not specifically measure teenagers’ inclination towards meeting new people and making new friends, it suggests that teenagers perceived this to be a beneficial, perhaps even desirable aspect of their program experiences.

Teenagers’ desire to meet new people is also supported by a recent evaluation of the CBG’s Science First program that utilized interviews with program participants and administrators as a means of evaluating program success. This study found that “an important aspect of the program was the formation of different types of relationships between students and between students and staff” (“Chicago Botanic Gardens: Science First remedial evaluation,” 2002). Because this study considered teenagers’ perspectives, it could be inferred that teenagers found the new relationships they developed during the program experience to be important, perhaps even desirable.
**Fun and/or new learning experiences**

*This study found that more than half of the focus group participants at BBG, CBG, DNS, and FTBG agreed on the importance of fun and/or new learning experiences.*

The importance of fun and/or new learning experiences is supported by the findings of a CCAD (as cited in Quinn, 1999) focus group study. Through a series of focus group interviews, the CCAD found that in considering participation in voluntary out-of-school experiences, teenagers seek opportunities to have “fun learning” while at the same time “practicing new skills” (pg. 97).

This research finding is further supported by Perkins et al.’s (2005) study of the motivations of 77, urban youth towards youth-program participation. Perkins et al. reported that a “notable feature that emerge from the study was the value the youth place on the learning that takes place in youth programs” (pg. 26). It is further stated that “every group mentioned the types of skills that could be learned…. [in spite of the fact that] the target question did not ask the youth to describe what they have learned or gained by participation in youth programs.” While Perkins at al.’s study focused only on ethnic minorities, its findings mirror, and therefore lend support, to those of this thesis research.

Brown (2005) lends further support to the importance of fun and/or new learning experiences to teenagers. This study found that successful youth development programs provide a “variety of activities that are fun, as well as engaging, enriching, and hands-on” (pg. 28). Successful programs place an emphasis on “experiential learning” (pg. 28). Because this study considered teenagers’ perspectives on what makes a youth development program successful, it could be
inferred that teenagers recognize the importance, if not desirability, of fun, experiential aspects of youth development programs.

The importance of fun and/or new learning experiences is further supported by Lekies et al. (2005). In this study, teenage consultants recommended that public gardens considering the development of youth programs should aspire to “create an inviting environment that is educational and fun” (pg. 20). While the motivations for this suggestion were not explored, it is plausible that they were benevolent. It is therefore likely that these consultants believed that fun and/or new learning experiences were important to future participants of the youth programs they were charged to evaluate.

Hope (2004) lends further supports to the importance of fun and/or new learning experiences to teenagers. In this study, ECO-ACT program participants reported that ECO-ACT was “a fun and memorable experience” (pg. 21) that teaches “life lessons” (pg 22.), increases “environmental awareness” (pg. 22). Though this study does not specifically measure teenagers’ desires for fun memorable experiences, it shows that teenagers enjoyed this aspect of the ECO-ACT program. Their enjoyment suggests that these experiences were important to them in some way, perhaps even desirable.
Chapter 5

RECOMMENDATIONS

The findings of this thesis research, in concert with existing literature, support the development of the following four practices that public gardens wishing to serve the teenage audience should consider.

**Practice #1: Empower teenagers to make meaningful decisions**

*Public garden-based learning programs should empower teenagers to make meaningful decisions.* Teenagers are especially cognizant of their personal interests in the subject matter being presented, their comfort with the social and physical environments in which they are learning, and their relationships to the individuals that are leading them. It is therefore essential to provide choices surrounding these program parameters.

**Practice #2: Promote life skills development, college preparedness, and self-sufficiency**

*Public garden-based learning programs should provide opportunities that promote life skills development, college preparedness, and self-sufficiency.* Of special interest to teenagers are opportunities that prepare them for life after high school. Internships, life skills trainings, and college preparedness opportunities should therefore be considered. Program experiences may be further enhanced by introducing teenagers to their future peers, which may include older teenagers, college students and professors, and other professionals.
**Practice #3: Facilitate the development of new relationships among peers and adults.**

*Public garden-based learning programs should provide ample opportunities for teenagers to build new relationships among peers and adults.*

Relationships are essential motivators for teenagers and should be cultivated thoughtfully. Scheduling time for independent exploration and social interaction is therefore highly advisable. The value teenagers place on these relationships cannot be overstated.

**Practice #4: Provide fun and/or new learning opportunities**

*Public garden-based learning programs should provide teenagers with a diverse array of fun learning opportunities.* These opportunities should be based in the personal interests and perspectives of individual teenagers while at the same time opening up new avenues for exploration and discovery. Games, themed-competitions, teaching opportunities, and hands-on activities are examples of programming options that may fulfill these expectations.
Conclusion

Studies have found that responding to teenage perspectives enables the success of youth-serving organizations (Quinn, 1999) and yet few researchers have made an effort to identify what teenagers actually want from their program experiences. In gathering, presenting, and interpreting teenagers’ perspectives on existing success models, this thesis provides public gardens and other youth-serving organizations with an enhanced foundation for meeting the expectations of the teenage audience; foundations, however, are meant to be built upon. Public gardens are therefore advised to investigate their specific audiences, remembering that teenagers are essential, and too often overlooked, sources of information, inspiration, and most of all, perspective.
Chapter 6

RELIABILITY AND IMPLICATIONS

Reliability

The reliability of this research is based on the internal validity of the study; the “match [between] the researcher’s categories and interpretations [and] what is actually true” (McMilan, 2004). The internal validity of this research is therefore dependent upon the ability of the researcher to design effective interview questions and administer interview protocols in a manner that would yield data reflecting the actual perspectives of case study participants. When assessing internal validity, the researcher’s capacity to accurately record, transcribe, interpret and present interview data should also be considered.

The reliability of this study was protected at several stages of the research process.

• Research questions and interview protocols were generated with the support of youth development researchers, University of Delaware faculty and public garden education practitioners.

• The researcher received training from the University of Delaware in conducting human-subjects research.

• The researcher received focus group training from recognized experts, Krueger and Casey (Kruger and Casey, 2000).
Interviews were digitally recorded and transcribed in their entirety.

Interview data were sorted using techniques established by Krueger and Casey (2000).

In spite of these controls, the internal validity of this study may have been affected by what McMilan (2004) describes as “experimenter effects” and “subject effects.” According to McMilan’s (2004) principles, the responses of interview subjects may have been biased by their participation in the interview process. These effects were controlled, in part, by isolating focus interview subjects, especially teenage subjects, from their peer groups and by conducting multiple interviews with each subject or subject group.

Subject responses may also have been impacted by the relationship of interview subjects to the researcher (a 26 year-old, male, Caucasian, graduate student). To help minimize these effects, care was taken to acclimate interview subjects to the interview process using interview protocols (Interview guide: student focus group interviews, pg. 74) designed by the researcher. Prior to the first interview at each site, a program staff member introduced the researcher to the program participants. Interview subjects were also given ample opportunities to familiarize themselves with the researcher during the multi-day visits that occurred during the case study process.

The process used to select research subjects may have affected the results of the study. Because program administrators were involved in the selection process, it is possible that these individuals may have favored the selection of certain characteristics that were beyond the specified selection parameters of gender and race. For example, those participants with a positive impression of the program may have been favored over participants with a negative impression of the program.
Implications

For the purposes of this thesis, all research subjects, regardless of age or grade level, are referred to as “teenagers.” There were few notable differences between the responses of high school and middle school students; where these differences were obvious to the researcher, they are indicated appropriately. While clear, developmental differences were observed throughout this study, the research model did not examine whether or not emotional development affected interview responses.

This research reports on the perspectives of teenage participants at the time they were interviewed and within the context of the programs in which they were participating. While many similar responses were found across the four case study sites, there is no evidence available suggesting that these responses would be consistent outside of the conditions of this study. The similarity in responses does, however suggest that this research is potentially valuable to public gardens choosing to target audiences similar to those of the four organizations studied (see Table 1, pg. 13). It should be noted that the rural population was poorly represented in this research.

The similarity in responses may be artificially influenced by the observed similarities in the sample selected for this study.

- Participants were middle and high school-aged teenagers enrolled in secondary schools in the United States of America.
- The four sites were located in and around major cities in the eastern United States.
- All of the focus groups at each of the four sites contained an ethnically and socio-economically diverse group of participants.
• All of the focus groups at each of the four sites contained a balanced gender distribution.

• Participation in the research was voluntary and agreed upon by the parents or legal guardians of the participants.
Appendix A: Participant interview questions
First interview (pre-participation)

Motivation

• What attracted you to this program?
• What sold you about this program?
• Why did you want to get involved in this program?

Expectations

• What do you want to get out of this program?
• What do you expect to get out of this program?
• Was there anything in particular that you wanted to learn?
• What do you expect to learn?
• What do you want to experience?
• What do you expect to experience?

Recommendations

• How do you think this program could attract more teens?
• What would you recommend to the people that design these programs?
Second interview (post-participation)

Motivation

• What kept you coming to the program day after day?
• What did you most look forward to?
• What was your best experience?
• Was there anything about the program that made you feel like you didn’t want to come back day after day? Explain

Expectations (Read expectations from initial interview)

• Did this program meet your expectations? Explain
• What did you gain most from this program?
• Of those things that you gained, what were most important to you?
• Think of a point during this program when you felt like you were really learning. When was it, and what about it allowed you to learn?
• What did you like most about this program? (Present list of program aspects provided by program administrator) Why?

Recommendations

• What would you change about the program?
• What advice would you give to improve this program to make it more attractive to teens?
Appendix B: Administrator interview questions
• What are the mission/purpose/expectations of/for this program?

• How does this program specifically serve this mission, purpose and expectations? How do you know this?
  o What opportunities exist for improvement?

• What is the target audience for this program?
  o How does this program connect to and serve this audience?
  o How do you know that you are reaching this audience?

• What opportunities exist for improvement?

• What are your expectations for the participants?
  o How do you present these expectations to participants?
  o How do you know that these expectations are understood?
  o How do you test these expectations?

• What have been/are the most significant challenges in developing and administrating these programs? Explain
  o What were/are the greatest obstacles toward overcoming these challenges?
  o What have you done/do you hope to do in order to overcome these challenges?

• What do you think attracts adolescents to this program?

• In what ways do you feel that you might attract more participants?

• What do you think participants enjoy most about this program?
  o How do you know?

• Why do you think they enjoy this most?
• What do you think the participants enjoy least about this program?
  o How do you know this?
  o Why do you think that is?
• What advice would you give to organizations that are planning on developing a program such as yours?
The following section contains background information on the four programs studied. This information is intended to provide a context for interpreting research findings.

**The Garden Apprentice Program (GAP) at the Brooklyn Botanic Garden (BBG)**

**Mission**

“To Provide opportunities for students to learn job skills in basic horticulture, outdoor education, and leadership while serving as assistant instructors for groups of younger children” (“Brooklyn Botanic Garden, Garden Apprentice Program Handbook,” 2005-2006).

**Goals**

“Providing a staff of responsible, qualified, hard-working interns to assist in the implementation of the Children’s Garden Program; train urban youth with hands-on experience in the basic techniques of horticulture and the key tenets of outdoor education; help participants to develop sound work habits and basic job skills that will be important in their future careers; encourage and develop leadership skills among participants through training, mentoring, and direct experience; increase parent involvement in our programs” (“Brooklyn Botanic Garden, Garden Apprentice Program Handbook,” 2005-2006).

**Program description**

“The Garden Apprentice Program at Brooklyn Botanic Garden provides students in Grades 8-12 with opportunities for personal growth and career development. The four-tier program includes training and volunteer placement with
increasing levels of responsibility focused on gardening, environmental issues, science, leadership, and career skills” (“Brooklyn Botanic Garden, Junior Apprentice Application,” 2004).

**Tier 1: Discovery Guides**

“Students entering 8th or 9th grade, Discover Guides focus on building leadership, communication, and horticulture skills; becoming familiar with the many facets of BBG; and building basic work skills that will transfer easily to any field. Volunteer placements will include gardening time in the Children’s Garden, placements at Discovery Carts, and assistance with public programs. Discovery Guides are committed to a year-long program including three weeks of training in the summer and one three hour shift per week on Saturday or Sunday during the school year. In addition there will be ongoing training on writing, research, public speaking, leadership, first aid and working with the public” (“Garden Apprentice Program for High School Students,” 2005).

**Tier 4: Senior Apprentices**

“Senior Apprentices are students entering the 11th and 12th grades that have completed the Junior Apprentice program and are prepared for extra challenges and responsibilities. Senior Apprentices are committed to a year-long program from July through June and work a minimum of seven hours per week in the school year and 20 hours per week in the summer. Senior Apprentices work in the Children’s Garden as assistants to Group Leaders and develop mentoring and supervisory skills as they work with younger tiers of the Garden Apprentice Program” (“Garden Apprentice Program for High School Students,” 2005).
Target population

This program targets teenagers entering into 8th through 12th grades, who demonstrate a compelling interest in BBG and GAP. In selecting and recruiting students for GAP, an emphasis is placed on achieving an ethnically diverse body of participants with an equal distribution of boys and girls.

The College First and Science First programs at the Chicago Botanic Garden (CBG)

Science First goals

“To introduce students to the world of plants and ecology; improve skills for scientific inquiry; encourage students’ interest in science and knowledge of careers in the sciences” (“Chicago Botanic Garden: Science First, Explore with us,” 2005).

College First goals

“Skill Building through apprenticeships for high school students; preparation for academic life after high school; exploration of careers within the green and museum industries” (“Chicago Botanic Gardens: College First,” 2002).

Program description

Science First

“Science First is a four-week summer camp at the Chicago Botanic Garden open to students completing grades 7-9” (“Chicago Botanic Garden: Science First,” 2005).
**College First**

“College first is an intensive, two-year apprenticeship that focuses on preparing young people for their future through mentoring and professional training. The program recognizes the importance of parents, teachers, mentors, and programs in the success of the lives of youth. College First provides high school apprenticeships that introduce students to professionalism in general and specifically to careers in a horticultural museum” (“Chicago Botanic Gardens: College First,” 2002).

**Program aspects**

**Science First**

Science First students “explore natural habitats such as prairies, woodlands, wetlands and rivers, learn about plants and animals that live in Illinois, meet scientists and learn about their jobs, conduct [their] own science investigation and present [their] findings to visitors at the Garden, make new friends with similar interests, and play games and have fun outdoors” (“Chicago Botanic Garden: Science First,” 2005).

**College First**

“During the summer, College First students are paired with mentors. Each mentor is a professional staff member of the Chicago Botanic Garden. The apprenticeships range from training in horticulture to assisting with children’s education or construction, depending on the interests of the students. To gain familiarity with their options after graduation, College First students make weekly visits to colleges, universities and vocational institutions” (“Chicago Botanic Gardens:
In 2005, College First students supplemented their internship experiences with weekly indoor and outdoor classroom training sessions.

**Target populations**

College First and Science First target Public School Students within the city of Chicago, Illinois. The College First program focuses on reaching students who, if they were to enter college, would be the first members of their families. Science First participants tend to be higher performing students (from underserved communities) who are motivated to succeed, but struggling academically. College First and Science First participants are committed to improving themselves and their socioeconomic position in life.

**The Christina Science Scholars program (CSS) at Delaware Nature Society (DNS)**

**Program description**

The Christina Science Scholars program is a partnership between the Christina School District and the Delaware Nature Society designed as enrichment to the science curriculum at the Christina School District. Participants are committed to three week summer sessions located at the Ashland Nature Center, in Hockessin, Delaware with a supplemental location at the Hagley Museum and Library, in Wilmington, Delaware.

**Program aspects**

Christina Science Scholars participate in a hands-on curriculum focused on topics, varying by grade level, and including watersheds, ecosystems, and water,
power, energy transfer, and pollution. Curricular activities include lectures, hiking, science experiments, field trips, and individual projects.

**Target population**

The target population for this program is seventh, eighth, and ninth-grade students in the Christina School District.

The kids that we want for this program are the kids that maybe were not doing too well in science. These are kids who are the ones who stay inside a lot, play a lot of video games, not really get outside and do a whole lot. They look like your average kid that you might see at the Mall on a nice sunny Saturday afternoon (J. Sebastiani, personal communication, June 2005).

**The Fairchild Challenge at Fairchild Tropical Botanic Garden (FTBG)**

**Mission**

“The Fairchild Challenge is designed to foster interest in the environment by encouraging students to: appreciate the beauty and value of nature, develop critical thinking skills with respect to environmental issues, understand the need for conservation and biodiversity, tap the resources of botanic gardens, arboreta, and other institutions for environmental and interdisciplinary studies, become actively-engaged citizens in their communities, and recognize that individuals do, indeed, make a difference” (“Fairchild Tropical Botanic Garden: High Schools,” 2004).

**Program description**

The Fairchild Challenge is a multidisciplinary competition in which middle and high school students are challenged to submit entries in a set number of specified competition categories. Value points are assigned to each category, and
students within each school pool their entries and submit them to the Garden, with a maximum number of entries per category. The entries from each school are evaluated by the Garden and points are assigned according to the number of qualifying entries in each category. Schools that receive a minimal threshold of points will be recognized during an awards ceremony while the top five point-earning schools will receive cash prizes. Two outstanding students may each receive a book prize. (“Fairchild Tropical Botanic Garden: High Schools,” 2004).

“The Fairchild Challenge is a series of competitions with points and deadlines and specific requirements. And we said to the high schools students, ok here are fourteen challenge options they total about 1200 points you try to get 600 points as a school. If your schools gets 600 points then your school will be celebrated at the Fairchild awards with a certificate. The school with the most points will get $1000 toward their environmental programs. The four runner up schools will get $500, every child will get a four person pass to bring their families back for free, and the most participatory students will receive a Fairchild challenge certificate” (C. Lewis, personal communication, April 2005)

**Program aspects**

Competition categories have included: conducting field work during an environmental immersion day; conducting intergenerational interviews; creating, expanding, and interpreting a school garden or natural habitat; conducting and reporting on environmental outreach; investigate freshwater flow and quality; write and perform original verse; creating artwork inspired by tropical plants; designing and producing environmental advertisements; designing a t-shirt logo for the Fairchild Challenge; linking people through photojournalism; performing an outdoor theatre scene; writing to decision makers on environmental issues; describing plant/animal interactions; drawing an environmental cartoon; communicating about environmental
issues with students in another country; comparing environmentally friendly products against non environmentally friendly products; reducing, reusing and recycling at school; writing testimonials documenting a lifestyle change to better the environment; producing research, opinion papers and project; and debating environmental issues. ("Fairchild Tropical Botanic Garden, The Fairchild Challenge," 2004)

**Target population**

Middle and high school students in the Miami-Dade County school district.
Appendix D: Human subjects application documents
March 11, 2005

Dear Sir,

I am writing this letter to request an expedited review for my thesis research currently entitled: *Gaining the Adolescent Perspective, A Study of Public Garden Learning Programs Serving Grades Seven Through Twelve*. I am requesting expedited review on the grounds that my research poses little to no risk to participants because it seeks to address group perceptions and group behavior and will employ focus group and interview methodologies. As part of this research, however, I will be studying the perceptions and behavior of minors.

I received my Certification of Human subjects Training on November 9th, 2004, and will serve as the principal researcher for this study.

Attached please find:

One copy of research protocol including: Administrator and Participant Interview Questions, and Interview Guide.

One copy each of recruitment materials including: Parental and Adult Subject Informed Consent Form an Adolescent Subject Recruitment Guide
Research purpose

The purpose of this research is to develop a model that will address the development and improvement of not-for-profit based learning programs designed to serve adolescents and teenagers. This model will incorporate, compare, and, contrast participant perspectives on the program with those presented by program administrators and educators.

Subjects and general methods

The subjects of this study from which data (perceptions) will be collected will include student participants (grades seven through twelve), program educators, and program administrators. Subject data will be collected in the form of focus group interviews with program participants (grades seven through twelve), personal interviews with program administrators and educators, as well as observations of and interactions with program participants during their daily activities.

Data collection will take place over the course of two to four separate three to four day case studies conducted onsite at each of the following not-for-profit institutions: Delaware Nature Society, Brooklyn Botanic Gardens, Chicago Botanic Gardens, and, Fairchild Tropical Botanic Gardens. All case studies will take place between April and November 2005

Adolescent subject selection

Adolescent subject selection will play a critical role in this study and will be conducted with the appropriate regard to the rights of prospective participants. Participation in this study is purely voluntary and no one will be allowed to participate in this study if they have not completed and presented to the researcher [prior to the onset of the study] a signed consent form. Due to the nature of this research two
separate consent forms are presented with this document; one will be utilized for adult participants (administrators and educators), the other is designed for the students and is to be reviewed and signed by their legal guardians.

**Recruitment of adolescent subjects**

This study recognizes the necessity of voluntary participation and therefore provides two layers of protection in the recruitment of adolescent subjects. Logistically, I will be unable to directly recruit any of the student subjects for this study. I will therefore be relying on program administrators to nominate, recruit, and distribute consent forms to, the participants. In order to properly support the rights of adolescent subjects I have drafted [and attached] an *Adolescent Subject Recruitment Guide*. I will be using this guide to orient those who will be recruiting adolescents on behalf of this study. This guide expressly states that participation in this study must be presented as entirely voluntary.

**Risks and right to refuse or withdraw**

There are no anticipated physical, psychological, social, or legal risks to the participants of this study. Participants will be systematically (prior to any interview or observation session) informed of their right to withdraw or refuse participation at any time.

**Confidentiality**

Data obtained by voice recordings will be treated with the utmost respect to the anonymity of the participants. All participant data will be scored and sorted without the use of any identifying characteristics; names, appearance, personality traits
etc. No one, other than myself, and a professional transcription company, will have access to any study related voice recordings or transcriptions.

**Benefits and compensation**

Students will be informed that this study presents them with an opportunity to provide insight that may benefit future participants of theirs and other similar programs. With regards to compensation, all student subjects who participate in a focus group interview will be provided with a small (less than twenty dollar) gift upon completion of the final case study. Adult subjects who participate in a personal interview will be presented with a moderate gift (less than seventy five dollars) upon completion of the final case study. No participant will be aware of these gifts at any point prior to completion of the study.

I hope to schedule my first case study for the middle of April. If you have any questions or require any additional materials I can be reached at extension 2517 or by e-mail at tsturman@longwoodgardens.org. Thank you for your time and consideration.

Sincerely,

Tree Sturman  
Longwood Graduate Fellow  
Longwood Graduate Program  
University of Delaware  
126 Townsend Hall  
University of Delaware  
Newark, DE 19716
Parental consent form

Dear parent/legal guardian,

A graduate student from the University of Delaware is doing a research study on extra-curricular learning programs for teens. The purpose of this study is to learn more about how programs like the insert program name (program acronym) at insert institution where program is being conducted (insert acronym for institution) benefit teens. The researcher is very interested in hearing your child’s opinions about the insert program acronym program and wishes to interview him/her and other participants of the insert program acronym program.

Your child has been nominated by insert nominator from institution to take part in this study, but, is in no way required to participate. If you do, however, allow your child to participate, then he/she will join seven of his/her peers for two separate group interviews. One interview will happen during the day on insert date, a second during the day on insert date. These interviews will take place as part of your child’s regular participation in the insert program acronym program at the insert institution acronym.

The University of Delaware maintains the strictest standards for the protection of your child’s rights as a research subject. While your child’s interview will be recorded on an audiotape, his/her privacy will be protected at all times. Also, your child may refuse to answer any question and leave the interview at any time. You may also choose to remove your child from this study at any time.

Your child’s participation in this study presents no risks. Your child will not benefit from this study, but, his/her participation will benefit the insert institution through the knowledge gained during this research.
If you have any questions about this project you may contact Tree Sturman at 302.831.2517 or tsturman@longwoodgardens.org, or insert institutional administrator at insert phone number or insert e-mail address. If you have any questions regarding you or your child’s rights as a participant you may contact the Chair of the Human Subjects Review Board at the Office of the Vice Provost for Research for the University of Delaware, at 302.831.2136.

Please print your child’s name

By signing below you agree to allow __________________________ to participate in this study. Please allow your child to read this document and give him/her the option of signing below. You will be given a copy of this form.

__________________________/__/__     ____________________________/__/__
Parent or Guardian’s Signature      Date     Principal Researcher         Date

________________________
Parent or Guardian’s Printed Name

By signing below I accept the conditions of this study and agree to participate.

_________________________
Adult consent form

To Whom It May Concern:

Tree Sturman, a Fellow at the University of Delaware’s Longwood Graduate Program, is conducting a research study on not-for-profit based learning programs for adolescents. Tree will serve as the principle researcher for this study, the purpose of which is to provide insight in the development or enhancement of adolescent learning programs at the Fairchild Tropical Botanic Garden and other similar institutions. Much of the data that will be used to inform this study will be collected from interviews with yourself and other administrators and educators of the [insert program name] (insert program acronym). During these interviews you will be asked to share specific details about the development and administration of the [insert program acronym] as well as your personal expectations, impressions, and experiences.

You have been selected by the researcher to participate in this study because of your relationship to the [insert program acronym] program. Your participation, however, is optional. If you do chose to participate, you will take part in no more than two one-on-one interviews with the researcher. One interview will be conducted during the day on [insert date], a second during the day on [insert date]. These interviews will be conducted as part of a two to three day case study at the [insert program acronym].

The University of Delaware maintains the strictest guidelines for the protection of human subjects. While these interviews will be recorded on an audiotape, your identity will remain anonymous throughout the entire research study as well as in any subsequent publications. In addition, your choice to participate, or not to participate, in this study will in no way impact your standing with the
University of Delaware, Longwood Gardens, or the Longwood Graduate Program. Finally, you may refuse to answer any question or leave the interview at any time. You may also choose to withdraw your commentary from this study at any time.

Your participation in this study presents no risks. The benefits will accrue to the insert name of institution and other not-for-profit institutions.

If you have any questions about this project you may contact Tree Sturman at 302.831.2517 or tsturman@longwoodgardens.org. If you have any questions regarding your rights as a participant you may contact the Chair of the Human Subjects Review Board at the Office of the Vice Provost for Research for the University of Delaware, at 302.831.2136.

Do you wish to participate in this study? Please initial here _______ if you agree to the audio-taping of the interview. You are free to stop the audio-taping at any time during the interview. By signing below you agree to participate in this study. You will be given a copy of this form.

________________________________________________________  / / / 
Participant signature Date Principal Researcher Date

Participant printed name
Interview guide: Student focus group interviews

Subject selection

Program administrators will be asked to produce a list of ten to twelve nominees to be considered for each focus group interview. Ideally, this pool of nominees should reflect the diversity of the population from which students are drawn into their respective programs. From this list of nominees I will randomly select eight subjects to recruit for this study. The administrator of each program will then officially recruit each subject. In order to protect the rights of the participants the specific guidelines for recruitment are set out in the Subject Recruitment Guide. No one will be allowed to participate in this study without submitting a Parental Informed Consent Form signed by his/her legal guardian.

Methodology

Focus group interviews will take place on site at each institution. Each interview will last approximately ninety minutes and will be recorded using an audio recording device. Program educator or administrator will introduce the researcher and provide the following information:

- The researcher’s name and school affiliation
- Why the researcher is here (in brief)
  - To conduct a study of learning programs for teens
- Timeline (90 Minutes)
- That he/she will be leaving the room and will not be listening to the conversation, but will be available if needed.
Prior to each interview, participants will be made aware that our conversation will be recorded and that their identities will remain anonymous. Each unique grouping of eight individuals will participate in two interviews over the course of the study. These interviews will be spread out over approximately two to twelve weeks, depending on the nature of their program.

Introduction

Hello. I want to thank you for being here. Again, my name is Tree and I am a grad student at the University of Delaware. I am here today because I am doing a study on not-for-profit learning programs and I am really interested in hearing what you have to say about the _________ program that you are in/just finished up. The way this is going to work is that I’m going to ask you a series of questions about your program to get you thinking and talking about your experiences. I want to stress that there are no wrong answers here. What each of you has to say is important, so if there’s something on your mind feel free to speak up. Also, if you feel uncomfortable with what is said here, or you really don’t want to participate, you are free to leave at any time. In keeping with this idea, I’ll ask that you give respect to one another, and if you have your phone with you please put it on silent mode for the next hour or so. If there’s an emergency of any kind, you need to take a call, or if you have to use the bathroom go right ahead. But, please come back when you are finished. As you’ve probably noticed I will be recording our conversation today. You have my word that your comments will be anonymous; no one outside of this room will get to hear what’s on this tape, and your name won’t be associated with anything that you say. Again, I am doing this study because I want to make the people who design these types of program aware of your needs and your perspectives. The more I can capture and
remember and, the more open and honest you are about your experiences, the better I will be able to communicate your voice to the people who can make a difference. Alright, lets get started…

**Protection of anonymity**

All audio recordings will be transcribed by the researcher or sent off site for transcription. In order to protect the identity of the subjects I will request that no names be recorded in these transcriptions. Additionally, upon receiving data I will permanently remove or alter any text that identifies characteristics i.e. names, appearance, voice inflections etc. Upon transcription the researcher will maintain exclusive access to audiotapes.
Interview guide: Adult personal interviews

Subject selection

Selection of adult subjects will be limited to those individuals who are directly related to the programs being studied. These individuals may include past or present: program educators, program directors/coordinators, directors/vice-presidents of education, garden directors, or public/private-school teachers or administrators.

No one will be allowed to participate in this study without submitting a signed Adult Subject Informed Consent Form. All participants will be informed of their right of refusal both in their consent forms as well as prior to being interviewed.

Methodology

Personal interviews will take place on site at each institution. Each interview will last approximately two hours and will be recorded using an audio recording device. Prior to each interview, participants will be made aware that the conversation will be recorded and that their anonymities will be protected throughout the study.

Each individual will participate in one to two interviews over the course of the study. These interviews will be spread out over the entire course of the study.

Introduction

Hello and thank you for participating in this interview. My name is Tree Sturman. I am a Fellow with the Longwood Graduate Program at the University of Delaware. The study in which you are about to participate is focused on not-for-profit based learning programs for adolescents. The purpose of this study is to provide insight to organizations that already have, or intend to develop these types of
programs. This specific study focuses on questions relating to student benefit, interest, and program intent. Over the course of this interview I will be asking you questions relating to programmatic details as well as broad questions that will have no specific ‘right answers.’ The overall goal of this interview is to gain a thorough understanding of your perception of and expectations for the __________ program and for the students who participate in it. Though you have already signed an informed consent form you still have the right to refuse to answer any or all of my questions as well as the right to pull out of this study at any time. As you see I will be taping our conversation today. Please know that you are ensured confidentiality! Your name will not in any way be associated with your comments today without your express permission. Finally, you reserve the right to review this study before it is submitted for publication or final university review. I want to thank you again for your participation and candor. Let’s get started…

**Protection of anonymity**

All audio recordings will be transcribed by the researcher or sent off site for transcription. In order to protect the identity of the subjects I will request that no names be recorded in these transcriptions. Additionally, upon receiving data I will permanently remove or alter any text that identifies characteristics i.e. names, appearance, voice inflections etc. Upon transcription the researcher will maintain exclusive access to audiotapes.
Recruitment guide

To the Recruiter,

Thank you for your willingness to help in recruiting participants for this study: Gaining the Adolescent Perspective: A Study of Public Garden Learning Programs Serving Grades Seven through Twelve. The following guide was assembled to help ensure that the recruitment process is appropriate to the requirements of this study. The subjects that you are being asked to recruit have been nominated for participation but have no knowledge of this program. Your primary function is to provide prospective participants with the information they will need in order for them, and their legal guardians, to make an informed decision regarding participation in this study. It is of the highest importance that subjects feel that their participation is absolutely voluntary. In order to achieve this level of confidence subjects must know that his/her choice to participate will not carry with it any intended negative or positive consequences.

Within this guide you will find a copy of a Participant Informed Consent Form, Research Statement of Purpose, and Recruitment Tips. When speaking with the subjects you should first go over the Research Statement of Purpose then read through the Participant Informed Consent Form. If the subject has any questions that you cannot answer it is very important that you defer their questions to the researcher, Tree Sturman, at tsturman@longwoodgardens.org, or 302.831.2517.

If you have any questions regarding this recruitment process please contact me before you begin recruiting.

Tree Sturman
Principle Researcher
Longwood Graduate Fellow
Research statement of purpose

This study aims to inform public garden and other not-for-profit organizations on the development and enhancement of learning programs for grades seven through nine. Critical to achieving this goal is the understanding of the perspectives of individuals who chose to participate in these programs. To this end this study will hone in on the motivations, expectations, and recommendations of adolescents.

Introduction

This researcher from the University of Delaware is interested in conducting part of his study in Chicago on The Science First and College First Programs. He needs to find twelve teenagers to participate in a group interview. [Insert name of recruiter, Insert recruiter’s association with the program (i.e. the coordinator)] of the Science First/College First Programs thought that you might be interested. You are in no way obligated to participate, but if you would like to know how, or find out more information about this study, I am here to answer your questions. Do you think that you might be interested?

If yes, Show them the Participant Informed Consent Form, allow them to look through it, and offer to read it to them out loud. Then ask them:

- Now that you have read this, would you like to participate in this study?

- If yes, give them a copy of the Informed Consent Form. Explain to them that in order to participate in the study they need to get the form signed by their parent or legal guardian.
Appendix E: Comparative tables

The following tables contain data derived from questionnaires distributed to each of the four case study sites. Information for the Brooklyn Botanic Garden was provided by Marilyn Smith, Director of Children and Family Programs; for the Chicago Botanic Garden by Nicole Patel, Coordinator of Secondary Education Programs; for the Delaware Nature Society by Helen Fischel, Associate Director of Education; and for the Fairchild Tropical Botanic Garden by Caroline Lewis, Director of Education at the Center for Teaching and Learning.
Table 2: Budgets, facilities and staffing data on four organizations offering learning programs for teenagers

<table>
<thead>
<tr>
<th></th>
<th>Brooklyn Botanic Garden</th>
<th>Chicago Botanic Garden</th>
<th>Delaware Nature Society</th>
<th>Fairchild Tropical Botanic Garden</th>
</tr>
</thead>
<tbody>
<tr>
<td>Organization’s annual operating budget (US$)</td>
<td>14,000,000</td>
<td>30,000,000</td>
<td>2,100,000</td>
<td>5,800,000</td>
</tr>
<tr>
<td>Education department’s annual operating budget [EDAB] (US$)</td>
<td>2,000,000</td>
<td>429,000</td>
<td>890,000</td>
<td>1,200,000</td>
</tr>
<tr>
<td>Percent of EDAB dedicated to middle and high school programs</td>
<td>18</td>
<td>40</td>
<td>N/A</td>
<td>40</td>
</tr>
<tr>
<td>Number of indoor classroom spaces</td>
<td>4</td>
<td>10</td>
<td>3</td>
<td>4</td>
</tr>
<tr>
<td>Total full-time education staff</td>
<td>26</td>
<td>33</td>
<td>8</td>
<td>12</td>
</tr>
</tbody>
</table>
Table 3: Background data on four public garden-based learning programs serving the teenage audience

<table>
<thead>
<tr>
<th>Program Name</th>
<th>Grade levels served</th>
<th>Program accreditation</th>
<th>Program sessions annually</th>
<th>Program session length in weeks (total/full-time)</th>
<th>Total students served annually (2005/2006 capacity)</th>
<th>Total teaching staff</th>
</tr>
</thead>
<tbody>
<tr>
<td>Garden Apprentice Program:</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Brooklyn Botanic Garden</td>
<td>8 - 12</td>
<td>None</td>
<td>4</td>
<td>52/3</td>
<td>38/75</td>
<td>1***</td>
</tr>
<tr>
<td>Science First:</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Chicago Botanic Garden</td>
<td>7 - 9</td>
<td>None</td>
<td>2</td>
<td>3/3</td>
<td>40/50</td>
<td>4***</td>
</tr>
<tr>
<td>College First:</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Chicago Botanic Garden</td>
<td>10 - 12</td>
<td>None</td>
<td>1</td>
<td>52/6</td>
<td>20/25</td>
<td>2***</td>
</tr>
<tr>
<td>Christina Science Scholars:</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Delaware Nature Society</td>
<td>7 - 9</td>
<td>Christina School</td>
<td>3</td>
<td>3/3</td>
<td>90/135</td>
<td>15</td>
</tr>
<tr>
<td>District</td>
<td></td>
<td>District</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Fairchild Challenge:</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Fairchild Tropical Botanic Garden</td>
<td>6 - 12</td>
<td>Miami/Dade County</td>
<td>2</td>
<td>52/&lt;1</td>
<td>12,500/unknown</td>
<td>3</td>
</tr>
<tr>
<td></td>
<td></td>
<td>School District**</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

* Program participants receive one elective credit from the Christina School District
** Program has been shown to meet many Miami/Dade County School District standards
*** Many full-time staff oversee program participants

How to read this table: The Garden Apprentice Program (GAP) serves grade levels eight through twelve and is not accredited. Four sessions are offered annually with each session running for 52 weeks, three of which are full-time. In 2005, 38 teenagers participated in GAP, but the program can accommodate 75 individuals. GAP has one full-time teacher with many full-time staff overseeing program participants.
Table 4: Funding and budget data on four public garden-based learning programs serving the teenage audience

<table>
<thead>
<tr>
<th>Program Name:</th>
<th>Annual cost of program (US$)</th>
<th>Source of program funding</th>
<th>Full-time administrative staff positions [FASP]</th>
<th>FASP fully-funded by program budget</th>
<th>FASP partially-funded by program budget</th>
</tr>
</thead>
<tbody>
<tr>
<td>Garden Apprentice Program: Brooklyn Botanic Garden</td>
<td>133,000</td>
<td>Donations and Grants</td>
<td>3</td>
<td>1</td>
<td>2</td>
</tr>
<tr>
<td>Science First: Chicago Botanic Garden</td>
<td>77,145</td>
<td>Donations and Grants</td>
<td>3</td>
<td>0</td>
<td>3</td>
</tr>
<tr>
<td>College First: Chicago Botanic Garden</td>
<td>89,400</td>
<td>Donations and Grants</td>
<td>3</td>
<td>0</td>
<td>3</td>
</tr>
<tr>
<td>Christina Science Scholars: Delaware Nature Society</td>
<td>98,000</td>
<td>Contract with Christina School District</td>
<td>2</td>
<td>0</td>
<td>2</td>
</tr>
<tr>
<td>Fairchild Challenge: Fairchild Tropical Botanic Garden</td>
<td>280,000</td>
<td>Donations and Grants</td>
<td>4</td>
<td>3</td>
<td>1</td>
</tr>
</tbody>
</table>
Appendix F: Human subjects approval form
HUMAN SUBJECTS REVIEW BOARD ACTION

University of Delaware
Newark, DE 19716

Protocol title: Gaining the Adolescent Perspective, A Study of Public Garden Learning Programs Serving Grades Seven Through Twelve

Principal investigator(s): Tree Sturman; Longwood Graduate Program

HSRB number: HS 05-265

Type of review: ☒ Expedited ☐ Full Board

The Human Subjects Review Board has reviewed the above-referenced protocol with respect to (1) the rights and welfare of the subjects; (2) the appropriateness of the methods to be used to secure informed consent; and (3) the risks and potential benefits of the investigation, and has taken the following action:

☐ Approved without reservation

☒ Approved as revised on original document.

☐ Disapproved for reasons noted below

Approval date: April 12, 2005

Approval period: 1 year

Expiration date: April 11, 2006

Submittal date for continuing review: March 11, 2006

Changes in the protocol must be approved in advance by the HSRB.

Comments:

Dr. Richard D. Holsten
Associate Provost for Research,
Chairman, Human Subjects Review Board
210 Hullihen Hall
302-831-2136, fax: 302-831-2828, rholsten@udel.edu
Appendix G: Certification of human subjects training
Certification of Human Subjects Training

The University of Delaware certifies that

TREENEN STURMAN

(Name of researcher)

attended an institutional training session on the use of human subjects in research on

12-9-2004

(Date)

The session included the following topics:

- The Belmont Report
- Federal regulations for using humans in research (45 CFR 46)
- The University's Multiple Project Assurance of Compliance
- Informed consent
- Institutional procedures
- Sources for additional information

Signatures:

12-9-04

Date

Researcher

TW Fraser Russell

Vice Provost for Research

Office of the Vice Provost for Research
University of Delaware
Newark DE 19716
302-831-4007
Appendix H: List of case study interviews
BROOKLYN BOTANIC GARDEN INTERVIEWS

Focus group interviews

- June 3, 2005: Garden Apprentice Program, “tier four”: Post-participation interview
- August 2, 2005: Garden Apprentice Program, “tier one”: Pre-participation interview
- August 18, 2005: Garden Apprentice Program, “tier one”: Post-participation interview

Personal interviews

- June 3, 2005: Nancy Cayemitte, Coordinator of the Garden Apprentice Program, Brooklyn Botanic Garden; Marilyn Smith, Director of Children and Family Programs, Brooklyn Botanic Garden; Ted Maclin, Manager of Children’s Garden and Exhibits, Brooklyn Botanic Garden
- August 2, 2005: Nancy Cayemitte, Coordinator of the Garden Apprentice Program, Brooklyn Botanic Garden
- August 16, 2005: Marilyn Smith, Director of Children and Family Programs, Brooklyn Botanic Garden
CHICAGO BOTANIC GARDEN INTERVIEWS

Focus group interviews

• June 29, 2005: Science First pre-participation interview
• July 1, 2005: College First pre-participation interview
• July 20, 2005: Science First post-participation interview
• August 9, 2005: College First post-participation interview

Personal interviews

• July 1, 2005: Nicole Patel, Coordinator of Secondary Education Programs, Chicago Botanic Garden
• July 20, 2005: Sadara Sangameswaram, Former Coordinator of Secondary Education Programs, Chicago Botanic Garden
• July 21, 2005: David Cooper and Kavan Yee, Science First Instructors, Chicago Botanic Garden
DELAWARE NATURE SOCIETY INTERVIEWS

Focus group interviews

- June 21, 2005: Christina Science Scholars, 7th grade section: pre-participation interview
- June 21, 2005: Christina Science Scholars, 9th grade section: pre-participation interview
- June 21, 2005: Christina Science Scholars, 7th grade section: post-participation interview
- June 21, 2005: Christina Science Scholars, 9th grade section: post-participation interview
- July 12, 2005: Christina Science Scholars, 8th grade section: pre-participation interview
- July 27, 2005: Christina Science Scholars, 8th grade section: post-participation interview

Personal interviews

- June 22, 2005: Joe Sebastiani, Members Programs Coordinator, Delaware Nature Society
- June 22, 2005: Helen Fischel, Associate Director Education, Delaware Nature Society
FAIRCHILD TROPICAL BOTANIC GARDEN INTERVIEWS

Focus group interviews

- April 13, 2005: Fairchild Challenge, high school competition
- April 14, 2005: Fairchild Challenge, middle school competition

Personal interviews

- May 12, 2005: Caroline Lewis, Director of Education, Center for Teaching and Learning, Fairchild Tropical Botanic Garden
- May 13, 2005: Bridgette Michaels, Fairchild Challenge Coordinator, Center for Teaching and Learning, Fairchild Tropical Botanic Garden
- May 14, 2005: David Whitman, Education Outreach Coordinator, Center for Teaching and Learning, Fairchild Tropical Botanic Garden
Bibliography


*Chicago Botanic Garden: College First.* (2002). (Available from the Chicago Botanic Gardens, 1000 Lake Cook Road, Glencoe, IL 60022)

*Chicago Botanic Garden: Science First.* (2005). (Available from the Chicago Botanic Gardens, 1000 Lake Cook Road, Glencoe, IL 60022)

*Chicago Botanic Garden: Science First, Explore with us.* (2005). (Available from the Chicago Botanic Gardens, 1000 Lake Cook Road, Glencoe, IL 60022)

*Chicago Botanic Garden: Science First remedial evaluation.* (2002). (Available from the Chicago Botanic Gardens, 1000 Lake Cook Road, Glencoe, IL 60022)


Dorman, G. (1985). *3:00 to 6:00: Planning programs for young adolescents.* (Available from the Center for Early Adolescence. University of North Carolina at Chapel Hill, Suite 211, Carr Mill Mall, Carrboro, NC 27510)


