AC 2010-963: TERRASCOPE YOUTH RADIO: ENGAGING URBAN TEENS IN A UNIQUE UNIVERSITY-COMMUNITY PARTNERSHIP

Ari Epstein, MIT

ARI W. EPSTEIN is a lecturer in the MIT Terrascope program, and also in the MIT Department of Civil and Environmental Engineering. He is the lead developer and instructor of Terrascope Radio and serves as the director of Terrascope Youth Radio. He is particularly interested in team-oriented, project-based learning, and in bridging the gap between learning in formal academic settings and learning in "free-choice" or "informal" settings, such as museums, media and clubs.

Beverly Mire, Cambridge Youth Programs

BEVERLY MIRE is assistant director for education at Terrascope Youth Radio. She also teaches media literacy and video production for Healthy Malden, Inc., and for the Association for Retarded Citizens of Eastern Middlesex (Mass.). A youth media specialist since 1992, her primary focus is using media as a tool to engage underserved youth in activities that will expose them to college life.

Trent Ramsey, Cambridge Youth Programs

TRENT RAMSEY is the Director of the Area IV Youth Center in Cambridge, Massachusetts. Before joining the youth center staff, Trent served as the Executive Director of YouthServe, Inc., a youth-serving nonprofit in Birmingham, Alabama. He has worked in the field of youthwork and youth advocacy for 15 years. He graduated from Birmingham-Southern College with a Bachelor of Arts in English and Sociology.

Karen Gareis, Goodman Research Group

KAREN C. GAREIS, Ph.D., is a Research Associate at Goodman Research Group, Inc., a research firm specializing in educational program evaluation. She is currently managing evaluations of several NSF-funded programs in the area of STEM education, including Terrascope Youth Radio; It's About Discovery, an ITEST science curriculum for grades 8-10; and the Albert Einstein Distinguished Educator Fellowship Program, in which outstanding K–12 STEM teachers are placed in appropriate federal agencies such as NSF for a year. Dr. Gareis received her doctorate and M.A. in Social Psychology from Boston University's graduate program in Human Development and a B.S. in Psychology from University of Illinois at Urbana-Champaign.

Emily Davidson, MIT

EMILY DAVIDSON is a senior at MIT, majoring in Chemical Engineering with a double minor in Physics and Earth, Atmospheric and Planetary Sciences. She has been a mentor to teen interns at Terrascope Youth Radio since the program's inception, and helped to develop the education plan for the program's first summer intensive session.

Elizabeth Jones, MIT

ELIZABETH JONES is a sophomore at MIT, majoring in Environmental Engineering. She has been a mentor to teen interns in Terrascope Youth Radio since 2009, when she played a major role in developing and carrying out the education plan for that summer's intensive session. She is also involved in "Terravoice," a weekly radio program focusing on environmental and social issues, broadcast weekly on WMBR-FM in Cambridge, Mass.

Michelle Slosberg, MIT

MICHELLE SLOSBERG is a sophomore at MIT studying Earth, Atmospheric and Planetary

Sciences, with a focus in Environmental Science. She has been working with Terrascope Youth Radio since 2009

Rafael Bras, MIT

RAFAEL L. BRAS is Distinguished Professor and Dean of the Henry Samueli School of Engineering of the University of California, Irvine. He is a professor in the department of Civil and Environmental engineering and holds a joint appointment with the Department of Earth Systems Science at UCI. For 32 years prior to joining UCI he was a professor in the departments of Civil and Environmental Engineering and Earth, Atmospheric and Planetary Sciences at MIT. He is past Chair of the MIT Faculty and former head of the Civil and Environmental Engineering department at MIT. Dr. Bras maintains an active international consulting practice. Currently he chairs a panel of experts that supervises the design and construction of a multibillion-dollar project to protect the City of Venice from floods.

Terrascope Youth Radio: Engaging urban teens in a unique university-community partnership

Abstract

Terrascope Youth Radio (TYR) is an NSF-funded program in which undergraduate engineering and science students at MIT mentor local urban teens as the teens produce radio/audio programming on environmental topics. The interaction has been remarkably fruitful, both for the teens and for the undergraduates. The undergraduates play strong roles in shaping the program, developing curriculum, and day-to-day operations, along with their mentoring work. They acquire teaching experience in an intensive but collegial setting, and they have the opportunity to relate their own developing skills and outlook to high-school students who may come from very different backgrounds. The teens relate easily to the MIT students, and through them develop a sense of comfort working regularly in the technically-oriented MIT setting. They also develop strong skills in understanding and reporting scientific/technical stories, and in relating those stories to their own lives.

The program consists of a six-week summer intensive session and an academic-year program that meets twice per week. Some teen interns participate in both components, and some in just one component. Over time, interns who remain in the program develop leadership and teaching skills of their own, as they help to bring more junior interns up to speed. The teens are responsible for all aspects of production, from story development and script writing, through interviewing and sound gathering, to final audio editing. Their work has been featured regularly on Northeast Public Radio, and an hour-long special that they produced ("Fresh Greens: Teens and the Environment") has been licensed and broadcast by public-radio stations across the country. In addition, TYR teen interns produced an audio tour of green elements in Boston Children's Museum's newly-renovated building; the tour is now the museum's official green tour, available both at the museum (installed in portable audio players) and on the museum's website.

TYR is a collaboration between MIT and the City of Cambridge Youth Programs, and it operates with some support from the Mayor's Summer Youth Employment Program. Its development has required close collaboration between two institutions that normally operate in very different ways, with different constituencies and institutional objectives. In this paper we present this collaboration as one example of a university-community partnership that has overcome those obstacles and others, and we describe both the program's successes and the lessons learned along the way. We also discuss results of an ongoing assessment conducted by independent evaluators, and the role that assessment has played in shaping the program.

Introduction

In this paper we report on a unique university-community partnership, in which urban teens, working under the mentorship of undergraduates at the Massachusetts Institute of Technology (MIT), create and broadcast radio stories on environmental topics. The program, called

Terrascope Youth Radio (TYR), is run as a collaboration between the MIT Terrascope program[1,2] and the City of Cambridge Youth Programs, with independent evaluation from Goodman Research Group (GRG). The program is offered both in a summer intensive session and in a less concentrated session during the school year. Teens may participate in either or both components; the goal is that the summer session should serve as a feeder for the school-year session, so that a significant number of teen interns come into the school year already knowing the fundamentals of radio production and ready to take a leadership role in teaching their peers. Teens may stay in the program for multiple years, growing in leadership and responsibility as they do. The program is open to students between the ages of 14 and 19. All teen interns receive an hourly stipend for participation in the program. The first group of interns started in the program in July 2008.

The teen interns are a very diverse group, representing a wide variety of income levels, racial and ethnic backgrounds, countries of origin (including some new immigrants), religious affiliations and levels of education. Most are drawn from Cambridge itself, although a few come from neighboring communities. Most attend the local public high school, but others attend a charter school, local secular private schools and one Catholic school.

One of TYR's explicit goals is to encourage other youth-radio programs around the country to produce more programming on STEM (science, technology, engineering and mathematics) topics, and particularly on topics having to do with environmental issues. There is an active and growing youth-radio community in the U.S., but with the exception of health and sexuality, these programs tend to produce relatively little material on STEM or environmental topics. Part of TYR's mission is to alter that, partly by example (by producing compelling, interesting, teen-oriented radio on environmental issues) but also more directly, both through specific collaboration with other programs and through other initiatives (see below, in "Audio/Broadcast Accomplishments").

The summer intensive session of TYR runs for six weeks, during which roughly 12 interns work 20 hours per week. The program serves as a work site for the Mayor's Summer Youth Employment Program, and so interns spend one hour per week in workforce-development activities organized by Cambridge Youth Programs. The school-year program runs from October through May or early June, meeting twice a week for a total of six hours. Some of the teens are highly scheduled and so need to miss some sessions for sports, theater or other activities. Roughly 12-15 interns at a time participate in the school-year program. Instruction and guidance are provided by professional staff from MIT and Cambridge Youth Programs, and by paid undergraduate mentors from MIT.

The teen interns of Terrascope Youth Radio have enjoyed significant accomplishments, both in audio production/broadcast and in personal development. Their work has been heard by tens of thousands of listeners, and they have grown not only in their technical skill but also in their competence to join the work force and in their comfort in the setting of a technical university. Undergraduate mentors have acquired new teaching and administrative skills, and their radio production work and analysis have been sharpened by the experience. The program has also built, and is continuing to strengthen, a link between MIT and Cambridge Youth Programs, a city

department that serves a large number of youth from groups that are currently underrepresented in STEM fields.

The Partnership

The major partners in Terrascope Youth Radio bring complementary skill sets and resources to the program:

MIT provides:

- Overall program management and coordination
- Staff with expertise in environmental topics and audio production
- Undergraduate mentors, also with expertise in environmental topics and audio production
- Program facilities and equipment, libraries, Internet connectivity, etc.
- A radio broadcast outlet (WMBR-FM, the MIT radio station).

Cambridge Youth Programs provides:

- Staff with expertise in youth work and youth development
- Knowledge of the local teen community
- Organizational integration with city infrastructure and programs (e.g., the Mayor's Summer Youth Employment Program)
- Knowledge of, and existing relationships with, local government and community-service personnel and facilities
- Opportunities for outreach within the city and beyond.

Goodman Research Group provides:

- Evaluation expertise (including expertise in formative evaluation to assist in the development of the program)
- Outside perspective on program operations, priorities and products.

In addition, Terrascope Youth Radio has strong working relationships with the Public Radio Exchange (PRX), a Cambridge-based organization that facilitates the production and distribution of independently-created audio content; Generation PRX, PRX's initiative to catalyze and connect youth-radio programs nationwide; and the Blunt Youth Radio Project, an award-winning youth-radio organization based in Portland, Maine.

Coordination and communication among partner organizations has sometimes proved challenging, as we discuss below, partly because the organizations have such differing constituencies, objectives and practices. Regularly scheduled telephone conferences and coordination meetings have proved to be very important in heading off and solving problems.

Evaluation

The ongoing external evaluation effort for Terrascope Youth Radio has focused primarily on the teen interns' experiences and outcomes, although some data have also been collected from staff, including the undergraduate MIT mentors. Surveys were also conducted with the leaders of other youth-radio programs, but these data are not relevant to the present paper and so are not discussed further here. Future evaluation efforts will continue to monitor teen interns' experiences and outcomes, but will expand to include various assessments of audience impact and impact on the youth radio landscape.

A review of the literature showed that no suitable existing instrumentation was available. Much of the existing instrumentation focuses on audience rather than participant impact [3,4] or is specific to the particular youth media program being evaluated.[5] Therefore, the instruments used to evaluate the TYR program were developed specifically for that purpose; all instruments underwent expert review to ensure face validity. It is worth noting, however, that educators and researchers have called not only for more longitudinal process and outcomes evaluation of youth media programs,[6] but also for developing peer-to-peer networks that would develop common measurement indicators and then aggregate and compare results.[7]

Research questions (provided here in Appendices A, B and C) were both formative and summative. To document successes and challenges in the implementation of the program, after the first summer session external evaluators conducted telephone interviews with six staff members and conducted a discussion group with the 13 participating teen interns. These qualitative data were gathered for the purpose of guiding the further development and refinement of the TYR program. As part of the ongoing evaluation, teen interns continue to be asked for suggestions for improvements to the program.

The primary outcomes for teen interns are gains in their radio production and communication skills (for example, in sound gathering and editing, script writing, and interviewing) and increases in positive attitudes toward STEM and STEM topics, including environmental and Earth-system science. Teen interns have completed written pre- and post-program surveys for the two summer sessions and the one academic-year session completed to date (a second academic-year session is currently in progress). These surveys are primarily quantitative, but also include some open-ended questions (see Appendices A and B). During the first three sessions of the TYR program, 30 different teen interns participated; one intern participated in all three sessions, and two interns participated in two sessions. Of the 30 unique individuals, 26 filled out pre-program surveys and 25 filled out post-program surveys; the remainder either did not fill out surveys or did not turn in parental consent forms, so their data could not be used.

Finally, during the winter of 2009-10, the external evaluators conducted an electronic, open-ended survey (see Appendix C) to learn more about the undergraduate mentors' successes and challenges in working with the teen interns and the benefits, if any, the mentors gained in the process of working with the teens. Of the eight undergraduate mentors, four responded to the electronic survey. Others reported on their experience via personal electronic communication with the program's director.

As we shall describe below (in "Undergraduate Mentors," "Outcomes for Teen Interns" and "Lessons Learned"), evaluation data have played an important role both in shaping the program's evolution and in helping to define the outcomes of the program for participants and staff.

Undergraduate Mentors

The undergraduate mentors are a key component of Terrascope Youth Radio. They are all sophomores or older, and all of them have taken a freshman-year class called Terrascope Radio, which is described elsewhere.[8] Most major in some form of engineering, but some are science majors and some have double majors that combine science and engineering or combine social sciences with science or engineering. All of them have interest and some expertise in environmental topics of various kinds. Their roles in the program include:

- Helping to develop summer-long and semester-long learning/curriculum plans
- Helping to develop plans for individual sessions
- Providing instruction in sound-gathering and radio-production techniques
- Planning and conducting listening sessions, in which teen interns listen analytically to a variety of radio pieces and discuss in detail what makes those pieces effective
- Helping interns to focus and conduct research
- Assisting with field recording
- Assisting and coaching interns as they record voice tracks in the studio
- Critiquing script drafts
- Assisting when interns experience technical difficulties while editing or mixing sound
- Listening carefully to draft pieces and providing detailed, constructive criticism
- Helping to develop strategies to address various issues (motivation, teamwork, etc.) as they apply to specific interns
- Maintaining equipment, backing up files and folders of interns' work, overseeing the organization of stored sound files and data

Beyond all of this, and perhaps equally importantly, the mentors serve as friends and role models for the interns, and they provide a generational link between interns and more senior staff. Interns come to trust and like the mentors, and to rely on their judgment and advice. The mentors are chosen to be very detail-oriented radio producers and listeners, and they help the teens to establish high standards for their own work. The mentors are clearly hard and committed workers, and so they help to set a tone of dedication and diligence among the teens. The teens come to see the mentors as people like themselves who have chosen to attend college and to pursue engineering or scientific studies. Interns occasionally stay after hours or come early to talk casually with mentors about such topics as colleges, applications, career choices and living away from home. Some interns also become comfortable and trusting enough to discuss their personal and family lives, often touching on very difficult subjects. The mentors help the teens to see themselves as part of a learning community, and to feel an attachment to that community.

Mentors report that the work is both challenging and very rewarding for them. Most of them have not worked with teens before, and so they are surprised by what it takes to be effective in this setting. As one of them put it,

> *"I think one of the most rewarding (and frustrating, but in a good way) parts of TYR for me is feeling like you can inspire the interns and earn their respect, since you aren't inherently given it."*

Another adds:

> *"I learned how to work with high-school students. Working with high-school students is *very* different from working with MIT students. High-school students need more guidance and don't do as well with 'open-ended' questions and assignments. They need explicit instructions."*

The mentors also are often surprised at how difficult it can be to help interns get and stay on task. In their normal work at MIT, the mentors are surrounded by peers who are already motivated and task-driven. The teen interns, on the other hand, may be coming to the program from a hard day at school and looking ahead to a lot of homework (or, in the summer, coming to work at TYR while friends are on vacation), and even the most motivated and excited of them sometimes needs an extra push or pull. In the words of one mentor:

> *"Getting the interns excited about what they are doing is difficult. And once they are excited, it is still hard to get them to take initiative and do things on their own. This plays into one of my successes: I had to learn that the interns would not do things on their own and would need help at every step."*

In this case, this mentor's reaction comes at least partly from the fact that she did not have prior significant experience working in this capacity with adolescents, and also partly from her context at MIT. Experienced youth workers who join the program are surprised at the high level of motivation and drive the interns show. In this case the mentor herself is growing in her understanding of young people who are in this age range and who come from a broad range of backgrounds.

The flip side of this is the reward mentors feel as the teens become more deeply engaged in the work:

> *"I have been able to watch the interns develop and mature as they take on the responsibility of producing a radio show that they know will be aired publicly. By working with TYR, I'm able to help shape and improve their lives. I really enjoy watching the interns become increasingly involved in their program. From week to week I can see them becoming more outgoing, mature, and organized. It's really rewarding to be able to be a part of this program. I really feel that I'm helping the interns learn life skills by guiding them with their research and development of listening skills."*

Another mentor writes that she personally benefits from this process:

> *"Because of the independence the interns have in TYR, combined with advice from the staff, the interns develop the ability to critically approach their own work. Overall, they improve their writing, research, editing and critical thinking skills. Even as a staff member in the program, I've had the opportunity to learn some of the same lessons as the interns."*

Mentors also appreciate the degree to which they sharpen their own listening and production skills in the process of working with the teens. As two of them write:

> *"I think I have really honed my technical skills in listening to radio, offering feedback and debugging technical issues with the software."*

> *"I am responsible for choosing radio listening samples for many of the group listening sessions, and from the interns' criticism of the pieces I play, I've had a hands-on reinforcement of effective and ineffective strategies in radio production."*

Multiple mentors credit their work in the program for such things as "improving my people-to-people skills," "helping me become more comfortable speaking in front of a group" and "really helping me be able to deal with a lot of different personalities." They also value the opportunity they have had to shape an educational program, develop lesson and session plans, handle logistics and administration, and take on other responsibilities. And they experience the sensation common to so many teachers, at all levels:

> *"Being able to do something is a lot different from being able to explain something to someone else so that they can do it. It requires a greater understanding of what you are teaching and the ability to communicate well."*

Finally, one mentor who has a strong interest in teaching—and especially in hands-on, student-driven settings—notes that

> *"I've been involved in environmental education programs for several years, both at MIT and in other settings. Working with TYR is a new challenge, though, because the interns are focusing on researching and presenting their findings more independently than in other youth programs I've worked with. As a TYR staff member, I've been able to guide the interns and direct them to appropriate resources, rather than outright lecturing or more traditional teaching methods. I'm really interested in pursuing further research or experience involving alternative learning and teaching methods, and TYR has been a terrific experience to participate in one of these types of programs."*

Outcomes for Teen Interns

The interns also experience significant gains, both self-reported and objectively observed. (In several cases interns' parents have also reported to TYR staff, in private communications, that

they have observed strong positive changes and development in their children as a result of the program.) Among these are:

- Broader, more detailed and subtler understanding of what constitutes an "environmental" topic or story. For example, when asked on pre-surveys to name some environmental topics, many interns wrote straightforward responses such as:

  "global warming"

  "recycling"

  On post-surveys, responses included:

  "Environmental issues and science aren't limited to recycling bottles and cans, but it covers a wide array of things including politics and special issues."

  "Social issues such as race. Politics."

- Change in attitudes about science and scientists. For example, in post-surveys participants from the summer 2008 program were significantly more likely than in pre-surveys to agree that scientists make people's lives better. Participants from the summer 2009 program disagreed on post-surveys significantly more strongly than on pre-surveys with such negative stereotypes as "scientists often do not have good social skills," "working as a scientist would be a lonely job" and "studying science is not cool or fun."
- Strong sense of pride in their accomplishments and their ability to prepare broadcast-quality material.
- As observed above by undergraduate mentors: increases in maturity, ability to take on and complete tasks, research and writing skills, etc.
- Increased ability to work as part of a team.
- Comfort participating in interviews with experts and authority figures. (This is a characteristic that will serve interns well in job interviews, college interviews, etc., no matter what career path they choose.)
- Increased skills in a number of communication and radio-production areas. Gains were particularly strong in the areas of sound gathering and editing; interviewing; and writing and producing stories about earth and environmental science topics, with 97%, 93% and 86% of teen interns, respectively, reporting that they had improved *somewhat* or *a great deal* in these areas.
- Ability to train incoming interns in use of equipment and software. This requires technical expertise, but it also requires a certain level of maturity, task-oriented work and patience. The ultimate example of this may be an intern from the program's first summer, who returned the subsequent summer as a key staff member (thus also providing an example to younger interns of what level of accomplishment is possible).
- Comfort with being on the MIT campus and feeling like part of the MIT community. (For example, interns who have been with the program for a while, when introducing themselves to potential interviewees, tend to identify themselves as working for an MIT youth-media program, not simply as youth reporters.)

Audio/Broadcast Accomplishments

Although Terrascope Youth Radio is a young program, TYR interns have achieved a number of significant milestones. The first of these was at the end of the program's first summer, when "Global Warming Rap," a piece produced by three TYR interns, was selected to be part of "Our Time: Teens and Politics," an hour-long special produced by KUOW in Seattle, Washington, in collaboration with Generation PRX. The special has now been licensed by more than 20 other stations, and it has been heard by well over 40,000 listeners. "Global Warming Rap" can be heard at:
http://web.mit.edu/tyr/Archive/Su2008/GlobalWarmingRap.mp3

Following the KUOW/Generation PRX model, in the summer of 2009 TYR itself teamed up with Generation PRX, independent producer Kelly Horan and New Hampshire Public Radio (NHPR) to create an hour-long youth-produced special called "Fresh Greens: Teens and the Environment." After soliciting contributions from youth-radio programs across the country, TYR teen interns helped to select pieces for the special; edited pieces as necessary; created interstitial VoxPop ("person-on-the-street") segments; collaborated on and voiced the on-air host script; arranged and mixed the edited pieces, host audio and incidental music to create show segments; and created on-air promos for the show. At the end of the process, NHPR accepted the show as-is, without making significant editorial or production changes—a very proud moment for all of the interns involved. NHPR broadcast the show twice and has since licensed it to 5 other stations, and plans to license it to additional stations for Earth Day 2010 (which had not yet occurred by press deadline for this paper). In addition to its virtues as a stand-alone special, "Fresh Greens" also plays a role in TYR's mission to encourage other youth-radio programs to produce more material on STEM/environmental topics, both by highlighting existing pieces and by providing the impetus to produce new pieces for the special. (Several of the pieces in the special were produced specifically in response to TYR's call for participation.) TYR plans to produce other, similar specials in the future. "Fresh Greens" can be heard at:
http://nhpr.org/special/freshgreens

During that same summer, TYR interns worked on another high-profile project. Boston Children's Museum had recently carried out an extensive green renovation, in the process earning LEED Gold certification for the renovated building. The museum wanted to highlight its new green features, and engaged TYR to create a "green audio tour." TYR interns interviewed experts who had worked on the renovation, visited the museum to gather sound, wrote and voiced scripts, and produced individual segments of a 10-stop audio tour. (An additional, introductory stop was written by museum personnel and voiced by a well-known green-building expert; the rest of the tour is entirely youth-produced.) The tour is now the museum's official green audio tour, available at the Information desk (pre-loaded into .mp3 players) and on the museum's website at:
http://bostonchildrensmuseum.org/about/audio_tour.html

Previously, in the late winter/early spring of 2008-9, TYR interns collaborated with WAMC/Northeast Public Radio and Hudson River Clearwater, a New York environmental education organization, to produce segments in an ongoing series of "Clearwater Moments,"

short pieces about the environment to be broadcast during WAMC's afternoon news program. These pieces were particularly challenging to produce, because they needed to be short (about a minute and a quarter long) but informative. For roughly two months, TYR-produced segments were broadcast once a week, reaching tens of thousands of listeners in seven states. Clearwater Moments produced by TYR interns can be heard at:
http://web.mit.edu/tyr/Archive/AY2008-9/ClearwaterMoments/

In April 2009, selected TYR interns traveled to Portland, Oregon, to attend a conference hosted by the National Federation of Community Broadcasters. There they participated in workshops with teens from other programs, and they gathered sound and interviews for a piece they later produced about environmentally-friendly companies and practices in Oregon. On their return they shared their experiences with the larger group, helping to emphasize the fact that TYR, while unusual in its environmental focus, is part of a larger community of youth-media organizations.

TYR interns also periodically host live broadcasts in collaboration with the Blunt Youth Radio project in Portland, Maine. For these broadcasts TYR interns create a number of pre-produced pieces, and they bring those, along with some works in progress, to WMPG, the community radio station with which Blunt is affiliated. In collaboration with the Blunt youth, TYR interns develop a "show wheel" (a clocklike chart detailing the timing of various show segments); split up hosting duties; and host the program live on-air, playing their own work and that of fellow interns, and conducting interviews and discussions about the pieces' subjects (and sometimes about the process of creating them). (Blunt youth, along with Claire Holman, the project's director, visit TYR periodically to advise and work alongside TYR interns.)

In the fall of 2009, TYR interns produced their own half-hour special about Cambridge and the environment. It was broadcast in December as a special edition of WMBR-FM's regular "Terravoice" program. The special included pieces about: the opening of the city's new LEED-certified library; the MIT biodiesel program; how people use (and how they feel about) the summer Sundays when a major roadway along the Charles River is closed to traffic so that pedestrians, cyclists and others can enjoy it; environmentally-sensitive but controversial renovations at the local high school; and whether natural or artificial turf is a more environmentally-friendly surface for athletic fields, with particular attention paid to MIT's facilities. Individual TYR pieces are also regularly broadcast as elements of ordinary "Terravoice" shows. The special can be heard at:
http://web.mit.edu/tyr/Archive/AY2009-10/Terravoice_12-28-09.mp3

TYR interns also participate in outreach activities throughout Cambridge and parts of Boston. In a typical outreach event, TYR interns will visit a youth center, day camp or other setting, play some of their work, discuss the production process, and then give attendees the opportunity to use audio equipment to gather sound and conduct interviews. Outreach events have also included a visit to teen interns at the New England Aquarium and an event at the MIT Museum as part of the Cambridge Science Festival.

Separately, TYR promotes the production of youth-radio pieces related to the environment through a unique collaboration with Generation PRX. As PRX staff have found, youth producers

particularly want to have their work heard and publicly critiqued by their peers, so Generation PRX has created a Youth Editorial Board, composed entirely of teens, whose members seek out and review youth-produced radio on Generation PRX's social-networking site. Terrascope Youth Radio has sponsored the creation of a Youth Environmental Editorial Board (YEEB) member, who creates and maintains a playlist of youth-produced pieces on environmental topics, and who reviews selections from that playlist. The position rotates among members of youth-radio programs around the country. The existence of the YEEB and the YEEB playlist is a means of assuring youth producers that if their work has environmental relevance there is a high probability that it will be heard, critiqued and publicized on Generation PRX.

Lessons Learned

Like any new program, Terrascope Youth Radio has encountered problems and obstacles and has had to evolve beyond them. Program staff (including undergraduate mentors), with the assistance of GRG, have worked to identify areas where change would be beneficial and to implement that change as rapidly as possible. Below are examples of major issues that have arisen and the solutions that have been implemented:

Location: During its first summer, TYR was located in a basement space at a local youth center. Centrally located and easily accessible, the center and its personnel were known to the young people, giving them a familiar atmosphere in which to work. It soon became clear, however, that the presence of other youth in the center was creating major distractions. In addition, many of the interns wanted a more "professional" space in which to work, and some specifically wanted to experience the MIT campus. After that summer the program moved to MIT, where it remains. The move has generally been a very positive one—particularly because this location makes it significantly easier for undergraduate mentors to participate—but it has resulted in a certain diminishment of the connection between TYR and Cambridge Youth Programs staff. Also, from the point of view of the youth centers, although the MIT facilities are excellent, there is a significant disconnect between the neighborhood and youth center on the one hand, and the day-to-day operation of the program on the other. These are issues for which we continue to look for solutions.

Recruiting: For the program's first summer, participants were drawn from the general recruiting pool of the Mayor's Summer Youth Employment Program. This meant that some of the interns were not particularly interested in media or the environment. Others had been hoping for a less intellectually demanding summer job. Some interns did have an interest from the beginning, and others came around over the course of the summer, but the presence of some disaffected interns made it more difficult to conduct the program effectively and led to low continuity between the summer and school-year programs. The following summer, TYR staff worked with staff from the Mayor's office to identify teens who might benefit most from the program and be most interested in it. That process yielded a group of interns who were motivated and interested from the beginning. They produced extremely good work—and a lot of it—over the summer, and the great majority of them continued into the fall, where they have served to bring new members up to speed quickly and to carry over the summer's working atmosphere. For the school-year program, some participants are recruited through word of mouth or events at the high school, and

others are identified by Cambridge Youth Programs staff as good candidates for the program. This has generally worked well.

Content and Deadlines: Ideas for content to produce during the first summer and part of the first school-year program were largely generated within the program by staff and interns, without a specific client or deadline. Beginning with the Clearwater Moments and continuing through "Fresh Greens" and the Boston Children's Museum project and into the next school year, TYR interns have worked on higher-profile projects, with particular clients to satisfy and specific, tight deadlines to meet. This has been inspiring, both to the teens and to staff and mentors, and although tight deadlines have occasionally led to some stress, they have also energized the group and made it more productive. The importance of satisfying an external client has also served as an excellent motivator for high production standards.

Tutorials: TYR staff have found (in retrospect, not surprisingly) that presentations of software, equipment and techniques are most effective when conducted incidentally and in a task-based manner, rather than along the lecture/practice model. This has become less of an issue in general as the program has developed a core of experienced teen interns who can help to teach the new interns as they arrive.

Organization of Equipment and Data: At the beginning of the program, particular teams of students were assigned to specific laptop computers and recording kits. This led to confusion when groups split up and recombined, and difficulty in locating interns' work from session to session. It also meant that files were stored haphazardly, in whatever system (or lack of system) seemed appropriate to the intern doing the work. Some files were lost, and some were never saved properly. Backing up files was a complicated and difficult process. The task generally fell to one undergraduate mentor, who recalls that

> *"I think I managed to keep all the students' files backed up on an external hard drive and consistently recovered lost or corrupt versions of files by sheer force of memory and willpower. Now that TYR has more interns, more projects and more staff, this model of backup and recovery became obviously unfeasible."*

In response to these problems, staff developed an entirely new approach: Each student was issued a USB thumbdrive and instructed to store all work on that drive alone. It now no longer matters which computer is used by whom, since the thumbdrives retain all the data. At first this system also involved a certain amount of chaos, since different interns organized their thumbdrives differently, and that made it difficult for staff to know what exactly needed backing up. To fix that problem, staff created a standard file structure and format for interns to follow. Interns know that anything not saved in that structure will not be backed up and may be lost. The system has worked quite well. As the original undergraduate mentor writes,

> *"I love how the new system actually gives each set of interns a thumbdrive to back up their files to. Not only does this lead to a more organized system, but it gives each intern a certain amount of ownership and responsibility for their files that we didn't have in the old system."*

Tardiness: During the first few months of the first school-year program, interns were consistently arriving late and often disgruntled from school. They also tended to take long breaks to buy and eat food from vending machines. Staff solved this problem by inviting interns to come in 15 minutes early for evening sessions to eat pizza together. This is completely voluntary—the interns are not paid for this time—but it is very attractive to the interns. It has evolved into a time when interns and staff sit together, eat, talk and relax before work begins. Interestingly, the transition from pizza time to work time is generally smooth; in fact, interns usually begin work a little earlier than the scheduled time.

There are still a number of unresolved issues, some of which may always need to be addressed on an ad-hoc basis:

- Pay Issues: TYR interns are paid their stipends through the City of Cambridge, but it has been difficult to get interns entered into the city's system in a prompt and accurate manner. Sometimes interns have gone for months without being paid, and some interns have left the program as a result. In some cases the problems originated with the interns (for example, some interns have submitted incomplete employment applications), but in other cases the problem lies within the city's complex organization. After problems during the program's first year, TYR was advised to change to a different, ideally more efficient way of handling interns' employment. In both cases, however, starting up the interns' pay cycles has not been a smooth process. There are many positive aspects to collaborations involving municipalities, but such collaborations by their very nature require negotiating with several different departments within the city; any breakdown or delay in those negotiations can lead to significant gaps in communication. As we worked to resolve this year's problems we built a significant relationship with the city's fiscal department, and we believe that next year will run more smoothly. We have already seen major improvements in the second half of the 2009-10 school year.
- Meeting Rooms: MIT's space-scheduling system favors academic programs, and those programs are not entirely consistent in their space needs, so the room in which the program meets during the school year changes from semester to semester. Some of the spaces are not entirely appropriate for audio work, which can be a problem. (During the summer the program meets in a dedicated and very suitable space, but that space is not available during the academic year.) This problem may never be fully resolved. It is a byproduct of meeting on the MIT campus, which is otherwise a net positive for the program.
- Staff Continuity: Because of shifting demands within the city's network of youth centers, the program cannot always be assured of being assigned a youth worker whose skills and interests are a good match. In addition, even when an appropriate youth worker is available TYR can offer only 10 hours per week of employment, not enough to be competitive in the youth-worker community. This year Cambridge Youth Programs has been able to identify a youth worker who is an excellent match to the program's needs, and has hired that person to work two days a week for TYR and three days for a nearby youth center. This is a good solution, but it does bring with it a whole new set of scheduling issues.
- Mentors' Time: The undergraduate mentors are all very busy people, with demands on their time that fluctuate over the course of the semester. This means that there will be

some weeks when few or no mentors are available, and other weeks when there are almost too many available. As in the case of meeting rooms, this is probably an irresolvable problem, since it originates in the nature of the MIT environment.

- Recruiting: Integration between TYR and the Mayor's Program is still not as smooth as it could be. This is an issue that will likely be resolved over time, as the two organizations do a better job of comprehending and adapting to one another's schedules. Recruitment from the community continues to be slow as well. One of the program's goals is to recruit urban youth from lower socio-economic neighborhoods within Cambridge, but this outreach requires considerable time and personnel. Because the program is so unusual, recruiting for it involves more than the typical amount of work educating and informing both the young people and their parents about the benefits of joining.

Looking Forward

Terrascope Youth Radio has proved to be an effective tool for engaging urban teens in understanding and reporting on environmental topics, and it has created a useful link between the City of Cambridge and MIT. Over the coming years, there are a number of areas in which the program is likely to evolve.

One of the most important of these involves raising the program's online profile, in order to bring in a larger and more youth-based audience. Along with this effort, staff will continue to search for new broadcast venues for TYR-produced material. Finding new high-profile projects for the teen interns to contribute to will also serve this goal.

As the program's audience grows, and as it involves more young people and more online listeners, it will become important to develop ways to evaluate the material's impact on its listeners. This is very difficult in any mass-media project, and it may require the development of new assessment tools or techniques, or the creative use of existing tools in an online setting.

Finally, Terrascope Youth Radio will continue to expand and strengthen its ties to other youth-radio programs, as part of its continuing mission to increase the visibility and effectiveness of youth voices in issues having to do with the environment.

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Appendix A
Terrascope Youth Radio
Youth Radio Producer Baseline Survey

Youth Radio Experience and Interests

1. Before applying to the Terrascope program, had you ever listened to youth radio or visited a youth radio program web site? ❒ yes ❒ no ❒ unsure

If yes, please list one or two examples of youth radio programs you have listened to or youth radio web sites you have visited.

2. What is the first thing you think of when you think about a Youth Radio Program?

3. What is the first thing you think of when you think about earth and environmental science?

4. As part of the Terrascope program you will have the opportunity to write and produce stories for the radio. What types of youth radio programming are you interested in learning about and doing? *(Please **check all** that apply.)*

❒ Commentaries (your opinion on a given subject)
❒ Interviews
❒ Personal storytelling
❒ Informational storytelling
❒ Other: *Please list:*_____

5. Please list a few topics or story ideas that you may be interested in producing.

Topics You Are Interested in Producing

1._____

2._____

3._____

6. As you begin your work with Terrascope Youth Radio (TYR), how interested are you in each of the following youth radio activities? *(Check **one box** for each.)*

	Not at all interested	Only a little interested	Somewhat interested	Very interested	Extremely interested	Not sure
Working with TYR leaders and youth producers on producing radio stories.	❒	❒	❒	❒	❒	❒
Working with audio and sound equipment and sound editing software.	❒	❒	❒	❒	❒	❒
Writing and producing stories about my interests.	❒	❒	❒	❒	❒	❒
Writing and producing stories about earth and environmental science topics.	❒	❒	❒	❒	❒	❒
Looking for information and sources for stories.	❒	❒	❒	❒	❒	❒
Conducting interviews for the radio stories.	❒	❒	❒	❒	❒	❒

7. Youth Radio programs cover a range of topics. Please rate your INTEREST in each of the following GENERAL topic areas. *(Check **one box** for each topic).*

General Topic Areas	How INTERESTED are you in these general topic areas?				
	Not at all intereste d	A little Interested	Somewhat interested	Very interested	Extremely interested
Arts and entertainment	❑	❑	❑	❑	❑
Education	❑	❑	❑	❑	❑
Engineering	❑	❑	❑	❑	❑
Environment	❑	❑	❑	❑	❑
General science	❑	❑	❑	❑	❑
Health care and mental health	❑	❑	❑	❑	❑
International topics	❑	❑	❑	❑	❑
Jobs and money	❑	❑	❑	❑	❑
Math	❑	❑	❑	❑	❑
Politics	❑	❑	❑	❑	❑
Relationships	❑	❑	❑	❑	❑
Sexuality	❑	❑	❑	❑	❑
Sports	❑	❑	❑	❑	❑
Technology	❑	❑	❑	❑	❑

Your School and Other Interests

8. In general, how much do you ENJOY each of the following school subject areas? *(Check **one box** for each subject.)*

	Does not apply to me	Not at all enjoyable	A little enjoyable	Somewhat enjoyable	Very enjoyable
Technology	❒	❒	❒	❒	❒
History	❒	❒	❒	❒	❒
English	❒	❒	❒	❒	❒
Math	❒	❒	❒	❒	❒
Art	❒	❒	❒	❒	❒
Science	❒	❒	❒	❒	❒
Languages	❒	❒	❒	❒	❒

9. In general, how CHALLENGING do you find each of the following school subject areas? *(Check **one box** for each subject.)*

	Does not apply to me	Not at all challenging	A little challenging	Somewhat challenging	Very challenging
Technology	❒	❒	❒	❒	❒
History	❒	❒	❒	❒	❒
English	❒	❒	❒	❒	❒
Math	❒	❒	❒	❒	❒
Art	❒	❒	❒	❒	❒
Science	❒	❒	❒	❒	❒
Languages	❒	❒	❒	❒	❒

10. Have you done or participated in any of the following in the past 12 months?

	Yes	No
Participated in a science, mathematics, or computer club.	❒	❒
Visited a science museum, aquarium, ecotarium, or other science exhibit.	❒	❒
Read a science or computer magazine or article (in the news or on the web).	❒	❒
Talked about a current science topic or story with a friend or family member (For example: *Global warming, growing and eating safe vegetables, fuel shortages, new computer technology*, etc.)	❒	❒
Listened to a science program or story on the radio or on a podcast (For example: *Science Friday, Living on Earth*, other). If yes, please list one or two examples. _____ _____	❒	❒
Watched a science program on TV or DVD (For example: *Discovery Channel, National Geographic, Nature, Animal Planet, NOVA,* other). If yes, please list one or two examples._____ _____	❒	❒
Attended any local science activities or events (For example: school science fair, *Cambridge Science Festival,* other). If other, please list:_____	❒	❒
Participated in outdoor activities (For example: nature walks, boating, camping, other). If other, please list: _____	❒	❒

11. Below are some statements about science and scientists. We want to know whether you agree or disagree with them. Read each statement carefully and then choose the response that describes your true feelings about the statement. There are no right or wrong answers! How much do you agree or disagree with these statements?

	Strongly disagree	Disagree	Neutral	Agree	Strongly Agree
Scientists often do not have good social skills	❒	❒	❒	❒	❒
Scientists have interesting jobs.	❒	❒	❒	❒	❒
Men are better than women at science.	❒	❒	❒	❒	❒
Science is helpful for knowing how to care for the earth and the environment.	❒	❒	❒	❒	❒
Scientists make people's lives better.	❒	❒	❒	❒	❒
Working as a scientist would be a lonely job.	❒	❒	❒	❒	❒
Scientists solve important problems.	❒	❒	❒	❒	❒
Science challenges me to use my mind.	❒	❒	❒	❒	❒
Knowing science will not help me to get a job.	❒	❒	❒	❒	❒
Studying science is not cool or fun.	❒	❒	❒	❒	❒

12. Working as a Youth Radio Producer will be an opportunity to learn about radio skills and to communicate information and stories. How do you usually communicate with others (friends, family, students, or co-workers) about your life, school, and work interests? *(Please **check all** that apply.)*

❒ Blogs
❒ Chat rooms
❒ Conversations/word of mouth
❒ Email
❒ Instant messaging (IM)
❒ Message boards
❒ MySpace
❒ Facebook
❒ Phone calls
❒ Podcasts
❒ Text messages
❒ YouTube
❒ Other; *please list:* _____

About You

13. Are you: ❒ Female ❒ Male

14. Your school year in September 2009:

❑ 9th
❑ 10th
❑ 11th
❑ 12th
❑ Other; *Please list:* _____

15. Are you: *(Please **check all** that apply.)*

❒ American Indian or Alaskan Native
❒ Asian
❒ Black or African American
❒ Hispanic or Latino/a
❒ Native Hawaiian or Other Pacific Islander
❒ White
❒ Other; *Please describe:* _____

16. Please list up to three jobs you might want to have when you get out of school, with #1 as the job you would most want to have.

1._____

2._____

3._____

Appendix B
Terrascope Youth Radio
Youth Radio Producer Post-Program Survey

Youth Radio Experiences

1. Please write one or two sentences describing what you think about NOW when you think about youth radio.

2. What is the first thing you think of NOW when you think about environmental issues and/or earth and environmental science?

3. How strongly do you agree or disagree with each of the following statements about your experiences with youth radio? *(Check one box for each.)*

	Strongly Disagree	Disagree	Not sure	Agree	Strongly Agree
It is fun to co-produce stories with others in my youth radio program.	❒	❒	❒	❒	❒
I prefer to work on stories about my interests.	❒	❒	❒	❒	❒
I enjoy working on stories about environmental issues and/or earth and environmental science.	❒	❒	❒	❒	❒
Youth radio gives youth skills they can use in their day-to-day lives.	❒	❒	❒	❒	❒
Youth Radio gives youth skills they will be able to use in the future.	❒	❒	❒	❒	❒
Youth radio gives youth a way to speak out about what they care about.	❒	❒	❒	❒	❒

4. How much do you think the Terrascope Youth Radio (TYR) program increased your skills in the following areas? *(Please check the box that best reflects your opinion.)*

	TERRASCOPE INCREASED MY KNOWLEDGE & SKILLS…			
	Not at all	**A little**	**Somewhat**	**A great deal**
working as part of a team with youth radio leaders, mentors, and other youth producers.	❑	❑	❑	❑
working with audio and sound equipment and sound editing software.	❑	❑	❑	❑
writing and producing stories about my interests.	❑	❑	❑	❑
writing and producing stories about environmental issues and/or earth and environmental science.	❑	❑	❑	❑
looking for information and sources for stories.	❑	❑	❑	❑
conducting interviews for radio stories.	❑	❑	❑	❑

5. How useful were the following activities in helping you learn youth radio skills?[1] *Please choose the response that best reflects your opinion. If you did not do a particular activity, check the "Did not do" box.*

	Not at all useful	**Not very useful**	**Moderately Useful**	**Very useful**	**Extremely useful**	**Did not do**
Field trips to Boston Children's Museum	❑	❑	❑	❑	❑	❑
Trips to interview experts for Boston Children's Museum Audio Tour (Boston, Cambridge)	❑	❑	❑	❑	❑	❑
Outreach to Cambridge Youth Programs and Mayor's Youth Summer Employment Program participants	❑	❑	❑	❑	❑	❑
Field trip/outreach to New England Aquarium	❑	❑	❑	❑	❑	❑
Field trip to New Hampshire Public Radio (Concord)	❑	❑	❑	❑	❑	❑
Field trip to Portland, Maine (Blunt Youth Radio/WMPG)	❑	❑	❑	❑	❑	❑
Other; please list: _____	❑	❑	❑	❑	❑	❑

[1] Activities varied with each iteration of the program, so these items were customized as appropriate.

6. What was your favorite activity of the program, and why was it your favorite?

7. What was your *least* favorite activity of the program, and why was it your least favorite?

8. Your youth radio work included learning from and producing stories with others. How helpful were the MIT students, other Terrascope staff, youth producers, and others during the program? *Please check one box for each.*

	Not at all helpful	**Only a little helpful**	**Moderately helpful**	**Very helpful**	**Extremely helpful**
MIT students	❑	❑	❑	❑	❑
Other Terrascope leaders/staff	❑	❑	❑	❑	❑
Other Terrascope youth producers	❑	❑	❑	❑	❑
Youth producers from other programs	❑	❑	❑	❑	❑

Your Interests and Attitudes about Youth Radio

9. Please rate your INTEREST in covering or producing stories in the following youth radio topic areas. *(Check one box for each.)*

General Topic Areas	How INTERESTED are you in these general topic areas?				
	Not at all interested	A little Interested	Somewhat interested	Very intereste	Extremely interested
Arts and entertainment	❑	❑	❑	❑	❑
Education	❑	❑	❑	❑	❑
Engineering	❑	❑	❑	❑	❑
Environment	❑	❑	❑	❑	❑
General science	❑	❑	❑	❑	❑
Health care and mental health	❑	❑	❑	❑	❑
International topics	❑	❑	❑	❑	❑
Jobs and money	❑	❑	❑	❑	❑
Math	❑	❑	❑	❑	❑
Politics	❑	❑	❑	❑	❑
Relationships	❑	❑	❑	❑	❑
Sexuality	❑	❑	❑	❑	❑
Sports	❑	❑	❑	❑	❑
Technology	❑	❑	❑	❑	❑

10. As a result of your work at the Terrascope program, are you interested in having the opportunity to produce more radio stories?

❑ YES ❑ NO

11. If yes, please list a few topics or story ideas that you may be interested in producing in the future, if given the opportunity.

1._____

2._____

3._____

12. Below are some statements about science and scientists. We want to know whether you agree or disagree with each of them. Read each statement carefully and then choose the response that describes your true feelings about the statement. There are no right or wrong answers! How much do you agree or disagree with these statements? *(Check one box for each.)*

	Strongly disagree	Disagree	Neutral	Agree	Strongly Agree
Scientists often do not have good social skills.	❒	❒	❒	❒	❒
Scientists have interesting jobs.	❒	❒	❒	❒	❒
Men are better than women at science.	❒	❒	❒	❒	❒
Science is helpful for knowing how to care for the earth and the environment.	❒	❒	❒	❒	❒
Scientists make people's lives better.	❒	❒	❒	❒	❒
Working as a scientist would be a lonely job.	❒	❒	❒	❒	❒
Scientists solve important problems.	❒	❒	❒	❒	❒
Science challenges me to use my mind.	❒	❒	❒	❒	❒
Knowing science will not help me to get a job.	❒	❒	❒	❒	❒
Studying science is not cool or fun.	❒	❒	❒	❒	❒

<u>Your School and Other Interests</u>

13. In general, how much do you <u>ENJOY</u> each of the following school subject areas?[2] *(Check **one box** for each subject.)*

	Does not apply to me	**Not at all enjoyable**	**A little enjoyable**	**Somewhat enjoyable**	**Very enjoyable**
Technology	❒	❒	❒	❒	❒
History	❒	❒	❒	❒	❒
English	❒	❒	❒	❒	❒
Math	❒	❒	❒	❒	❒
Art	❒	❒	❒	❒	❒
Science	❒	❒	❒	❒	❒
Languages	❒	❒	❒	❒	❒

[2] Questions 13 and 14 were not asked on the summer version of the post-program survey because the summer program is only 6 weeks long.

14. In general, how <u>CHALLENGING</u> do you find each of the following school subject areas? *(Check **one box** for each subject.)*

	Does not apply to me	Not at all challenging	A little challenging	Somewhat challenging	Very challenging
Technology	❒	❒	❒	❒	❒
History	❒	❒	❒	❒	❒
English	❒	❒	❒	❒	❒
Math	❒	❒	❒	❒	❒
Art	❒	❒	❒	❒	❒
Science	❒	❒	❒	❒	❒
Languages	❒	❒	❒	❒	❒

15. How likely are you to do each of the following activities sometime in the next 6 months? *(Check one box for each.)*

	Not at all likely	A little likely	Somewhat likely	Very likely	Extremely likely
Participate in a science, mathematics, or computer club.	❒	❒	❒	❒	❒
Visit a science museum, aquarium, ecotarium, or other science exhibit.	❒	❒	❒	❒	❒
Read a science or computer magazine or article (in the news or on the web).	❒	❒	❒	❒	❒
Talk about a science topic or story with a friend or family member.	❒	❒	❒	❒	❒
Listen to a science program or story on the radio or on a podcast (For example: *Science Friday*, *Living on Earth*, other)	❒	❒	❒	❒	❒
Watch a science program on TV or DVD (For example: *Discovery Channel*, *National Geographic*, *Nature*, *Animal Planet*, *NOVA*, other).	❒	❒	❒	❒	❒
Attend a local science activity or event (For example: school science fair, *Cambridge Science Festival*, other).	❒	❒	❒	❒	❒
Participate in outdoor activities (For example: nature walks, boating, camping, other).	❒	❒	❒	❒	❒

Looking Ahead

16. After your Terrascope Youth Radio (TYR) experiences, how likely are you to…
(*Check one box for each.)*

	Not at all likely	A little likely	Somewhat likely	Very likely	Extremely likely
recommend the Terrascope program to others.	❒	❒	❒	❒	❒
continue to work with Terrascope Youth Radio.	❒	❒	❒	❒	❒
continue to listen to youth radio or visit youth radio web sites.	❒	❒	❒	❒	❒

17. **Please list up to three jobs you might want to have when you get out of school, with # 1 as the job you would most want to have.**

1._____

2._____

3._____

18. Finally, if you could provide one piece of advice to make this youth radio program better, what would it be?

Appendix C
Terrascope Youth Radio
Open-Ended Questions for Past and Present Mentors

1. Please briefly describe your role and responsibilities in your work with the TYR program.

2. What would you say were the biggest successes for you in your work with the TYR program?

3. What would you say were the biggest challenges for you in your work with the TYR program?

4. What have been the rewards or benefits for you from working with TYR and the TYR interns? What have you learned from the experience?