

Entertainment Technology Center

INTERNSHIP PROGRAM DOCUMENTATION

Growing Interest in Robotics & Learning Technology (G.I.R.L. Tech) Team

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PURPOSE OF THIS DOCUMENT

This manual is written for Entertainment Technology Center (ETC) student teams who are interested in running internship programs as part of their semester-long projects. Our goal in writing this manual is to outline the internship program process and share some of the lessons we've learned in leading ten high school girls through eight-week internships while developing a robotics exhibit for the Children's Museum of Pittsburgh. After reading this manual, students should understand the challenges and benefits of working with interns. We hope that future groups can benefit from our recommendations for realizing an internship program from planning to completion within a semester project timeframe.

This manual was created by the Growing Interest in Robotics & Technology (G.I.R.L. Tech) team in spring of 2009. G.I.R.L. Tech was a combination pitch and client project with two main objectives. The first was to design and fabricate a semi-permanent robotics exhibit aimed at three- to seven-year-olds for the Children's Museum of Pittsburgh. The second objective was to lead a robotics-focused internship program aimed at high school girls for the YWCA Greater Pittsburgh and the Girl Scouts Western Pennsylvania. Our team worked to create as much synergy as possible between these two goals by encouraging our interns to take part in the design and testing of the Children's Museum exhibit. In addition, our interns pursued related robotics projects of their own and visited a variety of Pittsburgh robotics labs and companies.

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PART I: INTRODUCTION

This section is intended to make readers familiar with the purpose of an internship and to suggest why running an internship program could be beneficial to your ETC project.

WHAT IS AN INTERNSHIP?

An internship is any official or formal program to provide practical experience for beginners in an occupation or profession. These temporary positions place an emphasis on supervised practical training. Internships can provide opportunities for the intern to:

- determine if he or she has an interest in a particular field
- learn useful skills
- create a network of contacts, and
- gain work experience and/or school credit.

For ETC project groups, running an internship program can provide free labor for entry-level tasks, alternative viewpoints from people of different ages or backgrounds, and an avenue for community outreach and project publicity.

INTERNSHIPS VS. OTHER EXTRACURRICULAR ENRICHMENT

The structure and intention of an internship program differs from that of other extracurricular enrichment activities such as topic-specific school clubs, hobby clubs, and competitions. Topic-specific school clubs (such as math clubs) tend to supplement the curriculum through informal meetings and professional mentoring, with the primary goal being to further participants' academic learning. Hobby clubs may also result in substantial learning, but their activities are driven by participants' own projects and goals of personal fulfillment. Competitions provide participants with clearly defined external goals that they strive to achieve in order to determine a winner. In all these types of programs, the main focus is on program participants' learning, interests, aspirations, or performance.

Internship programs, on the other hand, match and balance the needs of the participants with the needs of the organization offering the internships. To this end, internships deemphasize academic learning and free exploration in favor of practical training that enables interns to help the organization meet its own goals.

WHY AN INTERNSHIP PROGRAM?

Because internship programs are in large part motivated by the needs of the organization, internships can be a unique opportunity to offer a learning experience to young people while simultaneously achieving other project objectives. When judging whether offering an internship program would be a good move for your project, consider the following:

- Does my team have tasks or small projects that it would be helpful to entrust to someone else?
- Could an intern learn something or gain useful work experience from completing these tasks?
- Does my team have the time and ability to select, train, and manage interns in performing these tasks?

If the answers to these questions are yes, than an internship program might be a good fit for you!

PART III: G.I.R.L. TECH INTERNSHIP PROGRAM POSTMORTEM

ABOUT OUR PROGRAM

THE DECISION FOR AN INTERNSHIP PROGRAM

The Spring 2009 Growing Interest in Robotics and Learning Technology (G.I.R.L. Tech) project was a combination pitch and client project. The pitch focused on the YWCA Greater Pittsburgh and Girl Scouts Western Pennsylvania's need for robotics activities and programming aimed specifically at high school girls with existing interest in robotics. The goal of the pitch was to provide these girls with either a curriculum tailored to their needs or a robot/robotics kit designed to support such a curriculum. The client project, proposed by the Children's Museum of Pittsburgh, was to create a museum-based experience for young children (ages three to seven) that would use interactive technologies in a way that emphasized the museum's values of sharing, collaboration, creation, learning and playing.

Our team discussed different ways of structuring our project in order to achieve both these objectives within the course of a semester. Ultimately, we decided to work with a small group of high school girls during the course of the semester, letting them shadow us and participate throughout the design, development, and fabrication of the Children's Museum exhibit. A number of factors motivated this decision:

- Although our work with the Children's Museum and with the Girl Scouts and YWCA could share a focus on robotics, the two audiences (children ages three to seven, and high school girls) were distinct from one another and required entirely different approaches.
- A majority of people on the team were much more interested in applied robotics or museum exhibit work as opposed to the more abstract work of developing a curriculum.
- The YWCA and Girl Scouts were willing to help us develop a curriculum and/or robotics kit for them to use with high school girls in the future, but they were equally—if not more—interested in having activities to offer their current high school members within the immediate semester.

We realized that an internship in which the high school girls worked alongside us on the Children's Museum exhibit would be an opportunity for them to learn about robotics, entertainment technology, and the process of seeing a project through from design to fabrication. At the same time, we hoped that turning the girls' focus toward the Children's Museum exhibit would allow us to accomplish more on the exhibit than we otherwise would. The internship program could keep the emphasis on practical programming and mechanical engineering skills (one of our team's strengths), as opposed to education and curriculum design (a field in which most of us had no experience). The major drawback of running an internship program was that we would not end the semester with a set of projects and activities that could be used in future high-school-level programs. Because of the YWCA and Girl Scouts' interest in getting their high school girls involved in a program *now*, we decided the lack of a reusable curriculum was an acceptable tradeoff in order to give these girls the unique experience of contributing to an ETC project while still at a high school level. We also resolved to document our process so that future ETC internship programs could benefit from what we learned.

PLANNING THE INTERNSHIP PROGRAM

Having decided to offer an internship program for high school girls, we planned the overall structure of the program by looking at the amount of time we had remaining in the semester and our ability to meet with the girls.

We finalized our decision to offer internships in Week Four of the semester, following quarter-semester feedback. Allowing a couple weeks for planning and recruitment, this meant that within the remaining semester we could offer at most a ten-week internship program. We ultimately settled on offering an eight-week internship program that took place over the course of ten weeks, after realizing that both our grad school team members and our high school interns had Spring Breaks coming up that fell on two different weeks. The first of these two breaks was awkwardly timed, falling immediately after the first week of the program, but we felt that it was worthwhile to start as soon as possible so as to have at least eight weeks of activities with the girls.

Due to our interns' high school schedules, our weekday meetings with them needed to take place within normal "after-school" activity hours—that is, between 3:30 and 6:30 pm. Initially we considered meeting with the girls only once a week, but realized that such infrequent meetings would not allow the girls to get deeply involved or have much continuity in their experience with the project. On the other hand, we were uneasy about the time commitment of having three-hour meetings with the girls three times a week, which our coordinator at the YWCA recommended. The YWCA was able to offer a shuttle transport for the girls, but only for two days a week, and once this became clear it was easy to settle on a schedule of meeting after school twice a week on Mondays and Wednesdays. The shuttle transportation also motivated a change in our session times—our meetings with the interns decreased in length due to travel time, so that we would meet with the girls from 3:40-6:00.

As for the content of our program, we wanted to get the girls involved in meaningful project work on the Children's Museum exhibit. In addition, we planned to offer enrichment activities such as visits to local robotics labs and companies and meetings with successful women in science, technology, engineering and math careers who could act as positive role models. We contacted ten local robotics organizations to arrange meetings and were successful in scheduling with five of them.

RECRUITING FOR THE INTERNSHIP PROGRAM

We wanted to recruit high school girls who already had interest in and experience with robotics, and to limit the number of participants so that we could give each intern individual training and attention. The G.I.R.L. Tech pitch members had already secured the Girl Scouts and YWCA as clients, so our recruitment process was entirely directed at these two organizations.

The YWCA had an existing girls and robotics group—the YWCA TechGYRLS—whose high school members could no longer participate in the same competitions as the other girls due to age cutoffs. We coordinated with Monique McIntosh, the current head of the TechGYRLS program, to involve these girls in our internship program. The Girl Scouts offered several programming- and mechanical-engineering-related activities but did not have a cohesive robotics program. Girl Scout involvement tends to drop off as participants enter high school, and so the Girl Scouts were excited to be able to offer a program directed specifically at the high school age group. Our plan was to obtain some participants directly through the YWCA TechGYRLS, and some through an application process with the Girl Scouts. Both the YWCA girls and Girl Scouts would fill out the G.I.R.L. Tech application and be approved by the team, and in this way we could select a mix of girls with similar levels of experience and interests.

Our actual recruitment process was not as competitive as we had planned, and heavily favored the YWCA TechGYRLS. There are several reasons why this was the case. The YWCA TechGYRLS are a relatively small and tight-knit group, while the Girl Scouts' loosely-organized troop structure meant that our contacts for the Girl Scouts were more removed from the actual program participants. Throughout the initial planning phase, the YWCA was more responsive and proactive in our communications, asking questions and providing information that helped us to shape the structure of the program. They also moved quickly to secure positions for their girls,

predicating their involvement in the program on our willingness to accept a minimum of ten to twelve interns from their organization. Our initial Girl Scout contact was a high-level program manager responsible for organization of Girl Scout programming throughout the Pittsburgh area, and so was less quick and focused in her responses to our initial emails.

We had initially intended to have no more than ten interns total, but we expanded our maximum enrollment to fifteen to accommodate ten YWCA girls and up to five Girl Scouts. Because all of our YWCA participants were based in the Homewood area, our Girl Scouts contacts encouraged us to target Girl Scouts in that area as well. We distributed internship applications through the membership manager for the Homewood region and received a single response. Our Girl Scout applicant was interested in programming and had some programming experience, and we accepted her into the program. (After the program began, we received a second Girl Scout application from a friend of our lone Girl Scout intern, which we also accepted.) The YWCA was interested in having more of their girls participate, and since we had fewer Girl Scouts than anticipated we allowed them to add three more girls, for a total of 14 interns in all.

We gave the YWCA applications for the TechGYRLS to fill out as well, but our YWCA contact experienced a death in the family and our coordination with the TechGYRLS decreased significantly. We never received the YWCA applications back. The YWCA faxed us names and emergency contact information for a few of the interns, but as our program began we did not know the names of all the YWCA interns and had no information on their individual interests, skills, and experience levels. We recognized that this was not an ideal situation, but since we could not get the information through our contact we hoped that the first couple of sessions before CMU Spring Break would give us a chance to get to know the girls so we could plan the program in more detail.

After we were a few weeks into the program, our YWCA coordinator revealed that several of our interns had never been members of the TechGYRLS program. Communities in Schools Allegheny Pittsburgh County (CIS Academy), a local dropout prevention organization, had approached our coordinator and asked whether the YWCA was offering any programs that could count towards high school math/science credit. Our coordinator had fit several CIS Academy students into our program's YWCA slots without asking or informing us, despite the fact that these girls had no pre-existing robotics interest, knowledge, or background. Knowing this, it became clearer why it had been so difficult to get information from the YWCA about their participants prior to the start of the program.

LAUNCHING THE INTERNSHIP PROGRAM

The first day of our internship program, our interns met us at the Entertainment Technology Center to play ice-breaker games, take a tour of the ETC's 5th floor and project rooms, and learn all about the G.I.R.L. Tech project. We were informed ahead of time that five of the YWCA girls would not be able to show up for the first week of the internship program because of their involvement in school sports semifinals. The remaining nine out of the fourteen girls were expected to be in attendance, but in fact only five interns total showed up that day.

The first week of the program was intended to help the girls get situated as part of our team, allow us a chance to get to know them and their interest and skills, and set expectations for the structure and purpose of the program. It was difficult to give the interns a complete introduction to the ETC and our project when they entered into the program on different days and many girls' first weeks of attendance were irregular.

RUNNING THE INTERNSHIP PROGRAM

After our week of introduction and a one-week recess due to CMU's Spring Break, the main phase of the internship program began. We met with our interns twice a week on Mondays and Wednesdays from 3:40pm-6:00pm. We had two main types of sessions—hands-on activity days, and visits with robotics organizations.

One of our major goals with the G.I.R.L. Tech program was to actively involve our interns in the design and development of the Children's Museum exhibit. In order to achieve this we brainstormed tasks that the girls could do that would help us get closer to completing the project. In the early stages of the project, this involved having the girls participate in brainstorming meetings focused on select topics and early design prototypes. Some of these early projects were among our most successful—the best were highly directed activities that were within the interns' ability levels and interests and yielded clear and immediate results that related directly to our own work. For example, the construction of a full-sized cardboard mock-up of the Children's Museum's exhibit allowed us to keep a large number of interns simultaneously engaged in a task that reflected and furthered our core team's work on the robotic painter exhibit. We supplied cardboard, pencils, rulers, and scissors, printed out a set of detailed blueprints, and asked each intern to measure and cut out a specific piece of the exhibit cabinet's design. Every intern had a clearly-defined responsibility and a motivation to perform well—when all the pieces of the exhibit were put together, everyone wanted theirs to fit properly. When the mock-up was complete, it helped to communicate what the ultimate physical exhibit would be like and was a good aid in testing whether the design was a good size for our target audience.

As we moved from design into implementation and construction, however, it became increasingly difficult to come up with project-related tasks for our interns to accomplish. This difficulty was compounded by the fact that we needed to engage so many interns at once. A few of our interns had enough background and/or interest in programming or mechanical engineering that they could have meaningfully contributed to the robotic painter project. As part of a large and less-receptive group, though, they were more difficult to identify (especially because their attendance records were as uneven as the others') and were not accessible to us unless we were willing to single them out. Because of this, despite our best efforts, our internship program gradually shifted into more of a curriculum—we began leading the interns in activities and projects that mirrored, rather than furthered, our efforts with the Children's Museum exhibit. We endeavored to teach them skills that we ourselves were using, but because these skills would never be applied to actual project work we did not gain back the time spent on training, and the interns were not able to truly participate in our project's development process.

In addition to hands-on activity days, we hosted or traveled to visits with a variety of organizations. The ETC community has a great many contacts, and so it was not difficult to arrange discussions, tours, and demonstrations with local robotics labs and companies. These visits provided some variety, allowed the core team a break from planning activities, and let the interns explore several different facets and applications of robotics. For our clients and the interns' parents, these visits were also a clear demonstration of the value of our program—we were granting our interns access to places and people they would not otherwise have been able to be in contact with, enriching their experience. Our relative ease in arranging these visits was definitely due to the ETC's contacts within these organizations—we attempted to reach out to additional robotics labs and companies, but none of these other groups responded.

When organizing these visits, we focused on people who could engage our interns in multimedia presentations and live demonstrations. Perhaps due to the audience—many of our girls were less interested in robotics than we had hoped—these visits had mixed reception. Some of the girls appeared visibly bored, but this was typical of their attitude towards the program. It was generally easier to draw these girls out through hands-on activity than through conversation and demos. On the other hand, in journal and blog entries even these girls sometimes made comments that suggested the exposure to robotics in different contexts had broadened the way they thought

about the field. The interns who were more inclined towards an interest in robotics were more likely to participate with our visitors, asking thoughtful questions and taking active part in demonstrations. These girls were better able to relate our visitors' information to their own lives and aspirations and think critically about the ideas that were being presented. Overall, the most successful visit was probably our brainstorming session with Bossa Nova Concepts. The visit was informative, but much of the time was spent doing marketing research with the girls. They responded very positively towards being polled for their opinions on potential robotic characters' cuteness levels despite the length and repetitiveness of these interactions.

Over the course of running the program, we developed a structure to our sessions with the interns. The beginnings of our sessions were difficult to plan for, since the girls' arrival times were unpredictable. The majority of our interns traveled in a single group via the YWCA shuttle, so any one YWCA girl's delay prolonged the travel time of all the rest. It was unusual for the interns to arrive to their session on time, which made planning difficult. The number of interns who showed up on any given day also varied wildly. We did have a high degree of control over the conclusion of each internship session. Regardless of whether a session was a hands-on activity day or a visit with a robotics organization, we always ended with a half-hour for the girls to write in their feedback journals and to blog on the team website. By integrating documentation and feedback into the daily structure of our sessions, we were able to gauge which activities they enjoyed and why, what frustrated them, what they were looking forward to, and have a record of attendance and participation.

CONCLUDING THE INTERNSHIP PROGRAM

We concluded our internship program with a completion ceremony and ice cream social at our exhibit's soft opening at the Children's Museum. The final day of our program was May 6th, 2009.

WHAT WENT RIGHT

PROGRAM CONCEPT

The concept of our program—to provide ETC-project-based internships to high school girls interested in robotics—was very well-received, both within the ETC and by outside individuals and organizations. In implementing the program we made decisions that forced us to stray from our original goals and offer more of a curriculum than a true internship experience; despite these changes, our experience this semester has convinced us that the original plan of project-based ETC internships for high school students is achievable and has a lot of merit.

The activities we set up for our interns gradually diverged from our project work until the two were no longer aligned towards a single goal, but rather running in parallel. In spite of this, our best interns continued to show interest in the Children's Museum exhibit and sought to get involved with it as much as they could. Many of the interns showed self-initiative and a willingness to learn. If we had not been tied down by the need to cater to a larger and less-interested group, we would have been able to devote more time to training these girls in ways that could have directly benefitted the project. We were able to successfully lead a group of interns through a project that mirrored our own, even under these adverse conditions—knowing what we do now, an ETC project group should be able to better create the conditions for their program's success from the start.

CONTACTS & NETWORKING

Our project had a tremendous boost due to ETC and CMU contacts and the contacts of our clients. Not only did these connections open doors for us in terms of arranging visits with a variety of robotics research labs and companies, but we were also able to get practical advice on running the program itself. Tonya Groover, the founder of University of Pittsburgh's Teen Leadership Institute, was particularly helpful, sharing the expertise she developed over more than three years of managing a program that aims to aid underrepresented and underserved high school students in succeeding at Computer Science. Networking at events such as "Carnegie Mellon in the Community: TECHNOLOGY" helped create public exposure for our project, and talking with other robotics and education groups showed us how much demand exists for programs like ours. Another vital contact, Jennifer Stancil of the Girls, Math, and Science Partnership, may aid us in paving the way for future ETC projects centered on girls and robotics.

VISITS WITH OUTSIDE ROBOTICS ORGANIZATIONS

Giving our interns direct exposure to professional roboticists working in a variety of fields was one of the surest ways for us to convey the idea that robotics has many different applications and that careers in robotics can be accessible, challenging, and fun. Early in the semester, our research on girls and technology taught us that girls tend to be more enthused about technology that serves a purpose as opposed to technology for its own sake. These visits not only showed our interns different facets of robotics, but suggested the diversity of goals that robotics can help achieve, such as creating engaging entertainment experiences, exploring the intricacies of lifelike motion, and aiding children in social development. In addition, these visits heightened the perceived value of our program by bringing our interns in contact with people and places they would not have been able to get access to on their own. The organizations we visited with brought their own unique backgrounds to their interactions with the girls, and their achievements lent credibility to the overall program.

FEEDBACK JOURNALS, WEBSITE & TEAM BLOG

We instituted feedback journals from the very start as a way to encourage our interns to reflect on their experiences and communicate with us about the effectiveness of the program. Every session, whether it was a hands-on activity day or a visit with a robotics organization, we wrapped up a half an hour early to give the girls time to write in their feedback journals and blog on the team website. Integrating documentation and feedback into the daily structure of our sessions created a record of attendance and participation and allowed us to readily gauge which activities the interns enjoyed and why, what frustrated them, and what they were looking forward to. In order to obtain useful information from our interns' journal and blog entries, we let them know that their feedback was useful and valuable to us and gave them a set of questions by which to pattern their entries: "what did you do?," "how did you do it?," and "what are you doing next?"

The feedback journals were a private forum for the interns to tell us what they thought about the program and activities, while the team blog was an opportunity for them to be more visible on our website and express their opinions to the world. We set up our team's online presence using the content management system Drupal, which allowed us to create a unified website and blog. Every team member, including our high school interns, had their own personal login and bio space and the ability to post text and images. At the same time we were able to set account permissions to constrain our interns' ability to edit the site beyond the blog posts that we encouraged. Our intern-generated content helped keep our site looking alive and up-to-date, and the interns' involvement with the website increased its effectiveness as a means of dispensing information to them and their parents.

INTERNSHIP NEWSLETTERS

We had a great deal of difficulty establishing effective channels of communication to our interns in the early weeks of the program. We could not get the names and contact information for all the YWCA interns, and so whenever we wanted to disseminate information to interns and parents we had to do it through our YWCA coordinator, who herself had difficulty getting information to the CIS Academy students. This convoluted and fragile chain needed to be replaced at our earliest opportunity. As we continued to meet and hear about new interns for the first time, we created accounts for them on the G.I.R.L. Tech website, which required the intern's name and email address. With this information in hand, we began to be able to contact our interns directly, as individuals. Because we could not get their emergency contact information through official channels, we asked them in person, having them tell us verbally or write the information down in their feedback journals so we could copy it into our records. As we gathered more and more email addresses, we were able to send out mass mailings ourselves instead of having to rely on other to pass the information on for us. An initial mailing regarding upcoming events became the first of eight weekly newsletters to interns and parents, recapping the events of the week, notifying them of what to expect in the coming week, and notifying them of any important program announcements. These consistent newsletters served to keep people up-to-date, and helped us gather more contact information as parents requested their emails to be added to the mailing list.

WHAT WENT WRONG

OVERLY ACCOMODATING ADMISSION PROCESS

Our lax admission policy when first setting up our internships was an early mistake that dogged us throughout the entirety of the program, becoming a recurring source of frustration and severely limiting the amount we were able to accomplish. Our intention had been to select interns by choosing the best candidates from a pool of applications. The moment we agreed to take on a minimum number of interns from the YWCA TechGYRLS program, however, we lost control over the recruitment process. Not only did this minimum number push us towards taking on more interns than we truly felt comfortable supporting, but the YWCA no longer had an incentive to make their girls fill out applications, or to make sure that the girls they directed to the program were a good fit for our goals. Despite our agreement with the YWCA, over half the girls we received from them were not TechGYRLS participants but rather students from a third-party organization who enrolled in our program as a means towards academic credit. We began our program with fourteen participants—some of these girls had to be dropped from the program due to poor attendance; a couple did not show up for a single session.

The major reason we agreed to our YWCA coordinator's suggestion that our program must accommodate ten to fifteen of their girls (the typical enrollment size for YWCA programming) was our fear that if we declined we might lose them as a client, which could reflect poorly on us in the eyes of the ETC. In order to be able to work with the YWCA on their terms, we limited the number of interns we were willing to accept from the Girl Scouts and limited our recruitment of Girl Scouts to a the Homewood district of Pittsburgh, which resulted in a very small number of applications.

After our program was underway and we could no longer accept new interns, our networking brought us into contact with several other educational organizations. These groups were eager to compete in order to get their girls involved in such a program, pushing their candidates' qualifications and relevant skill sets. Had we been willing to risk losing the YWCA as a client in order to maintain a competitive application process, we could have reached a much larger audience of potential participants and chosen only applicants who were well-suited to our project. As it happened, we found ourselves altering our program in an attempt to better suit our participants, who had diverse expectations of what our program should be and, in some cases, a profound lack of interest. It

would have been better for our project, our program, and our participants if we had been more selective at the outset.

DIFFERENT START TIMES, GENERAL ATTENDANCE PROBLEMS

Another difficulty we faced from the beginning of the program was that of attendance. On any given day we did not know how many interns would be showing up for our session, which made planning difficult. We saw few YWCA interns consistently regardless of their level of engagement with the program. Our Girl Scout interns seemed more conscientious about coming regularly—this may at least in part have been due to parental involvement and the fact that their admission process seemed more competitive, making their position within the program feel more valuable.

We sought advice about this problem from Tonya Groover, founder and head of the Teen Leadership Institute, a technology program that targets underrepresented and underserved high school students. We immediately implemented her advice—to track attendance and implement an incentive program to help increase it—but even with the support of the YWCA coordinator this seemed to have little effect. Having a more solid attendance policy in place from the beginning of the program—and requiring all interns to be present for those first sessions when program rules and expectations were made clear—might have yielded different results.

HIGH RATIO OF INTERNS TO GRAD STUDENT TEAM MEMBERS

Even if all of our interns had been motivated individuals with some robotics background, a group of ten interns is difficult to integrate into an ETC project team's work structure. With so many interns, it is difficult to avoid falling into a more curriculum-like structure focused on keeping the interns occupied, as opposed to a task-based structure in which the interns are able to make meaningful individual contributions to the project.

The most straightforward way to avoid this difficulty would have been to be stricter in limiting the number of interns our program would accept, perhaps no more than a one to one ratio of interns to ETC. Another possibility would be to take many interns, but to space out their sessions so that they do not all work with the team at once. Identifying specific tasks for interns before recruitment begins could aid in determining which approach would make more sense for a given team. For a team in which intern tasks all revolve around a common skill set, it probably would make sense to take on fewer interns and have them train and work all together, enabling them to help one another and build off each others' learning. For teams with a variety of disparate intern tasks, it may make sense to have a larger number of interns that work with the team according to different schedules depending on what training they need and what tasks they are working on.

GROUP-ACTIVITY-BASED STRUCTURE

Having a large and inconsistent group of interns, many of whom had much less robotics background and interest than we had hoped, our goals of running a true internship program as opposed to a curriculum proved impossible. We were unable to train our interns in mechanical engineering or programming skills and assign them meaningful project tasks, as we had hoped to do. Instead, in consideration of the circumstances we altered our aims and strove to engage the girls in a project that paralleled our work on the Children's Museum exhibit: a series of activities that could support programming and mechanical engineering novices as well as girls with some robotics experience. We worked to highlight the similarities between the interns' efforts and our own in the hopes that they might feel some sense of ownership over the robotic painter exhibit. We also focused heavily on the visits

with outside robotics organizations in the hopes of opening the girls' minds and possibly sparking interest for girls who had not previously considered how the field of robotics could relate to their own experiences.

PART II: RECOMMENDATIONS FOR FUTURE ETC SEMESTER-LONG PROJECT INTERNSHIP PROGRAMS

PLANNING THE INTERNSHIP PROGRAM

- **Pick an internship coordinator**—Choose a single person on your team to be in charge of the administrative aspects of the internship program, such as promoting the program and distributing applications, collecting applications, coordinating interviews, and providing work and space for the interns.
- **Set specific dates that make sense within the context of your overall project schedule**—Your internship program will need to function within the context of your overall semester-long project, as well as the schedules of your interns. Get specific with your dates early on, and pay attention to ways in which your teams' school schedule and the schedules of your interns are likely to affect the program.
- **Figure out what projects are suitable for interns**—Each task delegated to an intern needs to fit two criteria: first, the completion of the task should be helpful to the project, and second, learning how to complete the task should be beneficial to the intern. The internship program should serve the larger aims of the semester project while providing the interns with real learning opportunities and work experience.
- **Plan measurable learning objectives**—Provide interns with clear direction and concise and measurable goals. You may find it helpful to document specifics such as your internship program mission, internship job descriptions, eligibility and application requirements, supervisory roles, and supervisor/intern evaluations. This information can help clarify expectations for both the core project team and the potential interns.
- **Decide on a maximum number of interns before you start recruiting**—When faced with actual individuals who want to get involved with your project it can be difficult to turn people away, even if they don't fit your needs, the program is not right for them, or you already have as many interns as you can handle. Consider carefully *before* you begin recruiting, decide on a maximum number of interns, and stick to this limit—you don't do anyone any favors by taking on more interns than you can afford to properly train and direct.

RECRUITING FOR THE INTERNSHIP PROGRAM

- **Recruit to meet your needs**—Choose interns to fit your program, don't change your program to fit your interns. Well-chosen interns will be an asset to your project team and will benefit from their involvement with your work. Interns who do not fit with your project's needs will divert time and energy away from your goals, slowing down the entire team.
- **Customize your application process**—Create applications that specifically check for the skills and interests you want to see in potential interns, while offering the potential of training to nearly-qualified candidates. Distribute these applications widely, making sure to target those organizations that are most likely to yield promising candidates.
- **Consider conducting interviews**—Is the candidate motivated and easy to communicate with? What are his or her goals and strengths? Will your team be able to work well with this person? Actually talking

with an internship candidate, whether over the phone or in-person, can help answer crucial questions about them before you make your decision.

- **Connect with interns as individuals rather than as a group**—Avoid middlemen. Ask internship applicants to contact you directly. Be sure to require that they provide you with personal and emergency contact information, transportation requirements, and any scheduling conflicts in order to be considered for the position.

LAUNCHING THE INTERNSHIP PROGRAM

- **Make the interns feel like part of the team**—Take time to give your interns a proper introduction to the team, their fellow interns, and the Entertainment Technology Center. Familiarize the interns with the team’s overall project, the specific internship projects they will be working on, and how their work fits into the project structure and goals.
- **Set expectations**—Let your interns know the purpose of your internship program and if possible give them specific job descriptions that reflect their responsibilities. Let them know you expect from them, what training you will provide, who they can go to for support and help, and how their work will be supervised/checked. Give them a sense of the end goal they can hope to achieve and the path they will take to get there.
- **Establish communication channels with interns and parents**—From the beginning, set up ways to keep interns and parents informed of what is going on in the internship program, and make sure that they know how to get in touch with you as well. Providing them with a phone number for reaching the internship coordinator, sending out regular email newsletters, and keeping the project website up-to-date can all convey a sense of security and professionalism.

RUNNING THE INTERNSHIP PROGRAM

- **Monitor attendance**—Formalize minimum attendance requirements from the start, as a condition of internship completion. Track whether your interns are there when they are supposed to be. If attendance looks like it may become a problem, issue warnings early and consider putting attendance incentives in place. If these measures prove ineffective, drop absentee interns from the program.
- **Have specific tasks and objectives**—If possible, break interns’ tasks down into day-by-day milestones so that measurable progress can be made in each session. Make sure the length and frequency of the interns’ sessions do not clash with the natural rhythm of the tasks they are expected to perform; sessions should be long enough for interns to engage with the work but not so long that they tire and become unproductive.
- **Tailor your training to the task at hand**—When training, focus on teaching only the information and skills necessary in order to do the task. Giving extraneous information directly can be confusing and slow progress down. As much as possible, interns’ projects should involve a single consistent programming language so that interns do not have to keep track of differing syntaxes and other quirks.
- **Never leave tasks to a single individual or sibling pair**—Make sure that at least two interns who are not related to one another are assigned to any critical task. Siblings tend to be absent on the same days, and if a family event or emergency comes up you will want to be sure that the task is still being worked on.
- **Have interns take detailed notes and communicate with one another**—Detailed notes will aid interns in keeping track of what they were last working on, especially when their work schedules are intermittent. If for any reason an intern is unable to continue with a task and another intern or team member needs to take over, a clear record of what they were doing and why will ease the transition. In addition, learning to

communicate what they are doing and learning will help the learning process and make the information more memorable.

- **Routinize feedback**—Build feedback mechanisms into the structure of your program. Feedback journals, blogs, or team emails can all be useful tools for feedback and communication. However you go about it, give interns an regular outlet for reflecting on their internship experiences and checking in with the rest of the team. Requiring interns to answer set questions, such as “what did you do?,” “how did you do it?,” “what are you doing next?,” and “what are your current challenges?” can lend structure to these writings and ensure that you receive useful information about the interns’ work.
- **Publicize progress**—Make your interns’ work visible! Use email newsletters and website updates to show off an effective internship program and keep up communication with interns and parents.
- **Be a good host/guest to outside groups**—If your internship program involves coordinating with outside contacts for meetings, tours, or demonstrations, be respectful of their time and do what you can to make the interaction easy for them. Provide phone contact information in case they need to reach you on short notice, and arrange details such as travel directions, parking, space reservations, and technological equipment ahead of time. Schedule such that if they are traveling to you, they have a little space of time to get set up beforehand; if you are traveling to them, endeavor to arrive promptly but not too early.

CONCLUDING THE INTERNSHIP PROGRAM

- **Have an internship completion ceremony**—When your internship program ends, celebrate the interns’ involvement and accomplishments! Holding a small graduation-type event in which you give the interns certificates of completion can be a satisfying way to wrap up the program. A fun, social element such as an ice cream social can also serve as an attendance incentive. Inviting parents of interns to join in recognizing their achievements can provide an appreciative audience.
- **Involve interns in the wrap-up of the semester project**—Since your team’s semester-long project probably completes around the same time as your internship program, involving the interns in the completion of the main project as much as possible can help reinforce a sense of ownership and teamwork. Having interns participate in ETC end-of-semester landmarks such as Final Presentation could be an impressive achievement and a valuable experience.
- **Collect overall feedback with an exit survey**—Before your interns leave, give them a chance to reflect on their overall internship experience, letting you know what they thought of the program and what they have learned over the course of their time with you.

PART IV: RESOURCES

MATERIALS

Useful internship materials include program applications, image release forms & emergency contact info database.

ONLINE RESOURCES

[I AM INTERN: A Blog by The Intern Queen](#)

[Internweb.com: Designing an Effective Internship Program](#)

[Gaebler.com: Resources for Entrepreneurs: How to Start an Internship Program](#)