IPRO 330

Creating a Contemporary and Dynamic Science Fair Bank for Chicago Public Schools

Final Report

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Introduction

Chicago Public Schools (CPS) annually hold a science fair competition requiring all high school students to create and present a science fair project. At the onset of the science fair process, there are local school-wide science fairs. The best student science fair projects are chosen to go to the next level of competition, the regional science fair. The best projects from this level are then forwarded to the city-wide science fair. Those students whose projects are among the best of the city then go on to the national science fair. Of course, there are very few projects that go to the national level.

Although these projects are extraordinary, many of the projects that are created are at a less than acceptable academic level. Students tend to have a lack of interest towards participating in the science fair. They are also not equipped with the necessary knowledge and skills to complete a quality science fair project. As a result, Chicago Public Schools teachers, the Applied Mathematics Department at IIT, the Mathematics and Science Education Department at IIT, the IPRO department at IIT, and IIT students alike have recognized the need for an improvement to the current science fair system in Chicago Public High Schools.

IPRO 330 was continued for the spring 2008 semester in order to allow a group of motivated and passionate undergraduates, consisting of a variety of majors, alongside willing faculty and supportive teachers in Chicago Public High Schools to work together to create a greater and more accessible science fair bank to improve science fair projects. This aspires to ultimately encourage interest in mathematics and science in CPS students.

Background and Objectives/Goals

The whole point of IPRO 330 is to try and improve math and science skills for high school students in Chicago Public Schools through the Science Fair program. IPRO 330 started in the spring of 2007 with this overlaying goal. The current semester was the third semester that this project has been worked on. The broad goal of the project has always remained the same, but the scope of the specific objectives of each project has changed from one semester to the next. This groups set out many objectives for this semester. Some of these were new, and some of were based off of objectives from previous semesters.

The societal costs of the current problem are huge. From observations in Chicago Public Schools in previous semesters, we have seen that there has been a lack of interest in mathematics and science. Therefore, this leads to a lack of engineers, mathematicians, scientists, and professionals in related fields in the United States today. Nearly every field involving the use of mathematics or science is crying out for seems to be in demand, because there simply are not enough people interested to fill the necessary jobs. Countries like China are far ahead of the United States in educating people in mathematics and science. The United States ranks in the lowest third of all major countries in the field of mathematics. If our IPRO is successful in making even one student motivated to study mathematics or science in college, then society will inevitably be benefited by the work of this IPRO.

During the first semester that IPRO 330 was in existence, the main goal was to

create Science Fair projects and guides that would be interesting to appeal to Chicago Public High School students. So, most of the work was simply put into creating these projects and guides, and then putting them on a website so that students could easily access the information. During the second semester, IPRO 330 realized the importance of getting feedback and increasing communication with Chicago Public School teachers and students. There was still a focus on creating projects and guides for the Science Fair program, but this was not the main purpose. The collaborative works of the first two teams paved the way for the objectives of the current group.

At the beginning of this semester, every member of IPRO 330 went to a Science Fair at a local Chicago Public School. Our intent in going to these schools was to talk with teachers to gain feedback about our website, to promote our website, and to give us an idea of what objectives we should set for this semester. We noticed that overall students were generally uninterested in the Science Fair program as a whole. How can students be interested in mathematics and science if they are not interested in something as interactive as a Science Fair project? Our group also noticed that there was a lack of skills in presenting data both orally, as well as in proper form, such as in a chart or graph, and there was little or no effort to analyze this data. No statistical tests were being done, even with those seniors involved in these projects. Actually, this was very discouraging, but we were encouraged to see that some students had actually used the resources offered from our website for their science fair projects. Some high school students admitted that they had trouble finding a project that they thought would interest them and adequately challenge them. We have this in the past, that many students have had trouble finding an adequate project that piques their interest, without spending a great amount of money on possible resources. So, for this semester, we had to take this feedback and use it to create our objectives for the semester.

Our first objective that has not changed over time was to create high quality projects and guides for the Science Fair website. This is the meat of the website, and there simply can never be enough projects and guides for a website that is aimed to serve hundreds of thousands of students. We wanted to continue to maintain a high quality of projects, as well as broaden the scope of our topics. We aimed to have at least one project for every official CPS Science Fair subject that existed.

In conjunction with the previous objective, IPRO 330 also wanted to improve upon previous guides, as well as add others. There were a few issues with previous guides, like lack of clarity or lack of depth, which the current group addressed. The students of this IPRO really wanted to maintain a high level of quality for this website. In this way, the guides were improved, as well as added to. One of the clear objectives was to add a Safety sheet to explain the use and the need for the Safety documentation on the IPRO website.

After being in existence for two semesters, the current semester's team had a strong focus on obtaining feedback from CPS teachers and University Professors. The team felt that since there was a good base of projects and guides, we wanted to make sure that the existing material was of high quality and useful for teachers. We wanted to get in depth feedback and meet with teachers and students in the classroom.

The current group also felt that improving the website, both in design and usability, would be very beneficial to the success of the project as a whole. When the team got the website code from the previous semesters, the coding was jumbled, not well

organized, and not up to HTML standards. The current group early on felt that it would separate the design component of the project from the content portion, so that more projects could easily be added and be fit into a webpage design agreed upon by the team. The current group also set a goal of making tutorials for future groups so that they could easily add projects to the website, or change the website as they see necessary.

Overall, there were three main directions for these goals: projects/guides, communication, and infrastructure. We broke up into these three sub teams, with the greatest number of members in the projects/guides team. We will talk more about the structure of the sub teams that were agreed upon to confront these objectives in the next section.

The following is some background information about the Chicago Public School Science Fair program (since that is the program that we are trying to assist) and Chicago Public Schools as an organization. There are also some observations that have been made by this project in previous semesters.

During the semester, we met various Science Fair officials. Probably the most influential was Angela Dumas, city-wide Science Fair coordinator. She gave us a lot of feedback on what things specifically we should focus on. These included creating a safety guide, fixing and improving upon data analysis guides, and also incorporating presentation and science writing guides. The entire team thought that it would be a good idea to follow her lead, because we could distribute our information more easily to Chicago Public School students by distributing brochures to students before the city-wide science fair, which would especially be useful for students when making the oral presentation. This mostly affected the projects/guides and communication sub teams in the way that they were looking at their objectives.

Chicago Public Schools educate students throughout the City of Chicago. Chicago Public Schools have no financial involvement in this IPRO project, but many educators within the system are very willing to volunteer their time and assist us with our efforts. Our primary contacts include Angela Dumas, City Science Fair Coordinator, Tammy Butler, Chicago Public Schools Post-Secondary Specialist, Eric Williams, Chicago Public Schools Post-Secondary Specialist, Alicia Choi, Area 23 Science Fair Coordinator, and Sophia Kim, Area 21 Science Fair Coordinator. We have also partnered with Christie Thomas at the University of Chicago in a joint effort to improve the Science Fair.

The purpose of the Science Fair program is to combine interdisciplinary studies into one project. There are many components of the Science Fair, there is the research, written report, oral presentation, visual presentation, creation and execution of the scientific methods, results and data analysis, and conclusions. This involves the use of English, History, Science, and Mathematics. The Science Fair is a powerful tool to get students interested in the scientific method. This is why our IPRO is aiming at assisting Chicago Public Schools with this multi-disciplinary program.

From the observations of members in this IPRO, there have been little or no efforts in the past to try to improve the Science Fair program. But, this semester we did become aware of a similar effort at the University of Chicago, and felt it necessary to pursue contact with them. In the near future of our projects, we will be collaborating with them in order to improve our own efforts and possibly work together on some things to try to make a difference. Their project is just getting started, so our ability to work

with them during this semester was quite limited, but the possibilities of collaboration in the future are very exciting!

Methodology

The first step was to better acquaint the new team with the difficulties that CPS students were facing with their science fairs. To obtain first-hand experience, each team member volunteered at least once as a judge at Chicago Public Schools hosting county-wide science fairs.

Second, the team agreed on actively seeking feedback on the website, especially from CPS teachers, instead of solely relying on the website's feedback surveys. We printed business cards and brochures to publicize our website and prepared presentations for large audiences willing to hear about our project and the resources we offer. We also emailed teachers the previous semester groups have contacted to continue obtaining suggestions and advices from them.

Finally, based on feedback, the website was revamped to make it more comprehensible by CPS teachers, students, and parents. We also emphasized the importance of easing the transition of the project for next semester's team. This involved maintaining an organized contact list with comments for each contact. Additionally, the website was standardized and detailed guides were written to describe how work was done.

Assignments

To achieve these goals, we divided the team into three sub-teams with the following assignments. Although the following model of task delegation was followed closely, team members deviated when necessary to aid in the completion of tasks which had immediate deadlines.

<u>Communications Team</u>

Establishing new while maintaining previous contacts was the primary responsibility of the communications team. In addition to keeping an accurate record of all contacts, this team actively encouraged our contacts, mainly CPS teachers, to provide feedback on the website.

- Rocio Diaz (sub-team leader)
    - Arranged and set up meetings with CPS teachers
    - Maintained an organized record of feedback and comments
- Angela Pak (team co-leader)
    - Created and updated business cards and brochures
    - Helped create very personal relationships with teachers affiliated with the science fairs (i.e. Angela Dumas)

<u>Infrastructure Team</u>

The infrastructure team handled the technical aspects of the website by revamping the website to incorporate all the relevant feedback that we received through the Communications Team. One main goal of the team was to standardize the website so future teams would have an easier time working with the website.

- Anthony Parrillo (team leader)
    - Collected feedback from the whole team so that the infrastructure team could effectively implement changes
    - Informed the team of the status and progress of the website during the weekly team meetings
- Keith Campbell (sub-team leader)
    - Provided the bulk of technical support to revamp the website
    - Organized the website by changing the homepage and implementing an online quiz to help guide students to an appropriate science fair project
- Shane Steward
    - Assisted Keith with technical tasks
    - Removed broken links from the website

Project/Guides Team

The project/guides team was responsible for creating high quality, contemporary science fair project ideas and guides and also updating previous project ideas and guides to make it more understandable.

- Patrick Ten Eyck (sub-team leader)
    - Organized weekly sub-team meetings to discuss projects and guides to add to the website
    - Made several changes to the guides which aid students with data analysis
- Leah Baldwin
    - Created the safety guides
    - Corrected and added previous material in accordance to feedback
- Yewon Gim
    - Wrote and posted science fair projects to the website
    - Constantly proofread and corrected errors within the project/guides section of the website
- Joshua Tate
    - Wrote and posted science fair projects to the website
    - Constantly proofread and corrected errors within the project/guides section of the website
- Aimee Totleben
    - Designed the content of the online quiz which guides students to an appropriate science fair project
    - Constantly proofread and corrected errors within the project/guides section of the website

Resource Control

Since the website was the heart of the project, two sub-teams were assigned to manage and add resources to it. The infrastructure team dealt with the technical details and offered easier ways for the project/guides team to add relevant material to the website. Such relevant material was based on feedback gained from the communications team.

Each sub-team had weekly meetings in addition to the whole-team weekly meetings. Each member was expected to work 4 hours outside of meetings each week to accomplish delegated tasks. However, the team realized that the delegated tasks only roughly followed hours assigned to them. As a general rule, team members to be as available as possible for each other.

Communication between members was also emphasized to ensure that tasks which needed to be done were delegated to the most appropriate sub-team. When meeting with CPS teachers or visiting high schools, a member from each sub-team was to attend if possible to maintain the group's overall awareness of the team's goals. Also emails were sent out regularly to everyone in the group so that each member will know what was happening, even though it might not be relevant to their sub-team.

Obstacles

The biggest challenge in the project was proper communication. While our overall goal was clearly established, means to fulfill our goal was not. Chicago Science Fair is a large scale event that has multiple variables that contribute to the quality. Obviously the most important variable is the participants themselves. We needed to establish good communication method between students and our group to aid them with their science fair projects.

Each team faced own unique challenges trying to best achieve the team's goal.

<u>Communications Team</u>

The biggest challenge communications team faced was lack of proper channels to establish contact. While email was a convenient tool, it provided unexpected challenges. The first challenge was obtaining proper email addresses. Teachers, Chicago Science Fair coordinators and others involved in various organization and groups provided them with multiple email addresses. In order to establish the correct contact email address, communications team had to find alternate ways, such as direct visit or contact. However even when proper email addresses were obtained, email inboxes of busy school teachers and science fair coordinators were full and their emails often got buried. In order to continue staying in contact and keep contacts interested, communications team had to keep everyone informed of our project status and get feedback on our progress.

The other challenge was the conflict in Chicago Public Schools Science Fair schedule and our IPRO's schedule. Most of the science fair starts during the end of fall semester and end in the beginning of spring semester. The team had to act fast to get contacts for the science fair season and unfortunately won't be able to see the effect of our project till the next science fair season starts.

Infrastructure Team

The web site was the major means of communicating to CPS students, teachers, and parents. However, in order to create and maintain the current website, the infrastructure team had to face many technical challenges.

The very first technical challenge was inconsistency in coding style. While the previous semester's team created a website, it was difficult to maintain and update it due to personal differences in coding style. The second challenge was compatibility of website for various computer environments. There were other various factors that created obstacles, such as broken links, image formatting, and etc.

Projects/Guides Team

Projects and guides team had to craft the direct message that will be communicated with students. Projects and guides team lacked feedback to provide proper direction.

The biggest challenge in the project creations was getting intriguing science fair project ideas. It was difficult for a small group of people to create a big enough project bank for all Chicago Public School students. Also there has been issue of copyrighted material and getting permission to upload ideas from a different science fair idea bank or link them on our own website.

Illinois Junior Academy of Science has a past science fair project bank but we had to face copyright issues and was not resolved until the website was already finished. The other challenge was to create clear and interesting enough guides for students to be interested and understand so they can improve their project quality.

Results

Most importantly we were able to establish proper communication with students and teachers through various events. The major result from our semester's IPRO was our new website and recognition of it.

We were able to monitor the website usage using Google Analytics and observe the number of visitors and the pages they have visited. The website visit peaked corresponding to the dates of our presentations given to students and teachers. Also, we obtained more hits on guides pages compared to the project pages, portraying that our website was not only just used for science fair but also as general science class' resource.

Following are results from our IPRO:

Recognition

We have increased the number of students and teachers who knew about our website. In the beginning of this semester, the whole IPRO team went to judge science fairs and found couple of our project idea put into a project. With our expanded contacts, more people visited the website (courtesy of Google Analytics), and more teachers and students knew about our website.

Technical Improvement

Most importantly, coding standards were established for future management and update of the website. The web site was designed to be compatible in various common browsers. The website repositories were established to keep our old versions and give easier access to modify the web site by multiple people in future semester IPRO groups. It also helped to keep track of old versions and updates made.

Effective Presentation

The new website has a more appealing look for the visitors. It featured a better color scheme and a design that looks more professional and attractive to students. Also, we featured a new logo that acknowledges our ties to Illinois Institute of Technology, to promote the institution and give the website creditability.

Quiz

We have created a quiz to help students to choose a topic for their science fair project. This is designed to aid students to capture their science interest. The interactive quiz helps students to be more actively involved with the quiz.

Expanding Projects Bank

We have updated sixteen more new projects. Following the feedback of Angela Dumas, we have a new format for the science fair project ideas that provided readers with a basic structure for multiple projects. With the expanded data bank, students have more science fair projects to choose from to match their interest.

Safety and Other Guidelines Update

One of the major accomplishments of the semester was creating the safety guideline that not only explains the rules but also explains why it is important to be safe. Also, improvements were made to other guides that were previously on the website. We improved them so it will be easier to read and also to explain why it is important not to overlook other elements of scientific research such as writing and presentations.

Recommendations

This semester, IPRO 330 really accomplished many objectives, as we have stated in this final report and can be seen on our website. But, that does not mean that the work on this project is complete. In fact, there is almost an infinite amount of work that can always be added to the project. We don't claim to have the best product for each and every student. However, that was not our effort, we wanted to cater to as many students as possible with the resources and the time that we had.

An obvious thing that needs to be done in the future is to not only maintain the relationships with Chicago Public School officials, but also to create new relationships. This means that we have to get into more schools, judge more Science Fairs, and really seek to gain feedback from teachers, students, and parents. We would also like to gain more contact with various university professors who can give this project some of their

expertise on how to improve various projects as well as the direction that we should go.

In the future, we want to add more interactive guides so that students will be truly interested in succeeding in the Science Fair program. If students are able to do more inputting of information, the guides will cater to them better if we are able to make guides of this sort. In this way, the students can learn even through practice. Specifically, next semester it would be beneficial for students if a guide on analyzing possible error of results was added.

The future members of IPRO 330 will also be looking to improve upon the projects that are already in place as well as adding more projects. It is very easy to add a couple of extensions to an existing project, and this opens the doors for several more projects. This semester we included a lot more open-ended projects. In this way, it will be easy to create many more projects out of the ideas that are already in place.

In addition, the website will need to maintained, and all new ideas will have to be implemented. The future group may want to add more pictures to jazz up the website a little bit. With the structure and the standards that have been set this semester, and the tutorials that have been created, it will be easy for future groups to add the content or even alter the structure of the links and the website in the ways that they want. Implementing new projects should actually be very easy, since we have separated the content from the style. It is very important that this is understood. The future teams will also be better able to track the amount of website traffic hits using Google analytics.

IPRO 330 will also be working closely with the University in Chicago in the future. This summer, the science fair project at the University of Chicago will be heavily worked upon. In their efforts, they will link to our website. Their website is already established, so that will bring a much greater number of hits to our website. It is very important that students are able to access the information that we have created, otherwise, what is the use? After this summer, the University of Chicago will be providing some feedback to this IPRO as to what information they would like to see added or developed (for existing material), so that this project can have a clear direction next semester. Jointly working with the University of Chicago, which is taking on some of the more logistical roles of the Science Fair, will be beneficial to both parties as we have both strongly agreed that there is no need to "reinvent the wheel" several times over.

Another thing that we have been thinking for the future is to try to gain some sponsorship. Financially, our IPRO has been limited to conducting projects with materials that you can buy at the hardware store or the like. The goal of the projects that we create is to make sure that students also can afford any outside materials that they might need in the completion of their science fair project. However, if we were able to use more high powered equipment which would be enabled by some sponsorship, this would be effective in reaching some students who may have access to more costly equipment. Another reason to try to gain sponsorship is so that we are able to more effectively spread the word about our project. If we are able to more advertising in Chicago Public Schools, then more students will be impacted by the work of our IPRO project, and our overarching goal will be attained.

The interests of students are always changing, and so the Science Fair website that we have created also needs to "keep up" with the changing interests so that we can truly have contemporary projects and guides for Chicago Public High School students.

As was expected, in the beginning, the whole group was not in total sync. For

some of the members, this was their first IPRO; for others, they had worked on this IPRO for numerous semesters and were waiting to see what could be accomplished this time around. Some of the members were friends before the IPRO began; others were complete strangers. The first thing that was done was that all of the group members were encouraged to judge a Science Fair, in order to gain a feel for the project and to come up with ideas. After a few classes, ideas had been proposed, plans had been made, and subteams had been created.

One of the main problems was that sometimes it was hard for things to be implemented on the website. A mass e-mail was sent when files were uploaded, but not enough initiative was being taken to add the content to the website. This was alleviated by sending the files to one person to look over; the person would then send it to the appropriate person on the Infrastructure to be implemented on the website.

Meetings were held on a regular basis in order to gauge how much each subteam had accomplished. From these separate meetings, in addition to class meetings, communication and teamwork improved. Part of the plan was visiting schools and informing the students about the website that was created; this allowed an opportunity for various team members to practice teamwork. Also, when something major was due, the task was not left to just one person; the team decided how the task was to be divided among various members.

Communications

The communication team was set up in hopes of making valuable contacts with Chicago Public School teachers, professionals, students and parents. The team's goals were to maintain communication with these contacts as well as to obtain any valuable feedback.

Throughout the semester, the communications team did an outstanding job at achieving these goals. We got feedback from many professionals throughout Chicago Public Schools. One of the most successful aspects of our communication was creating a relationship with Angela Dumas, the City Wide Science Fair Coordinator, and Christy Thomas, Digital Media Coordinator for Science Fair website at University of Chicago. Furthermore, another very valuable contact we were able to make was that with Mrs. Maria Santiago, Math and Science Education Program at IIT.

Angela Pak was in charge of setting up a meeting with Ms. Angela Dumas to come and talk to our IPRO group on Wednesday, February 27, 2008. In this meeting, Ms. Dumas gave us feedback as to the things that she liked about our website, and the things that we could do to improve it. Ms. Angela Dumas talked to us about the needs for CPS Science Fairs which included having safety, presentation, and data analysis guides for our project bank.

The communication team also completed brochures for our team to use and updated the business cards to make them more professional. The brochures were divided into three categories: student, teachers, and IPRO abstract brochures. The aim for this was to reach or target people with different backgrounds.

Furthermore, the communications team arranged various presentations in and outside IIT. Specifically, Rocio Diaz met with Mr. Eric Williams, Postsecondary

Specialist in CPS Area 23, on February 19, 2008. He agreed to set up at least three high school visits this semester. The three High Schools he mentioned were Hubbard, Kelly, and Curie High Schools. However, we were only arranged to visit Hubbard High School on April 4, 2008. Rocio Diaz, Aimee Totleben, and Leah Baldwin, were the presenters. They visited four classrooms. These included honor's chemistry, and three biology classrooms. Ms. Totleben had created a quiz by this time. This quiz was distributed among the high school students. The aim for this quiz was to help CPS students deduce a possible science fair project based on their strength in any specific subject of science. These subjects ranged from Mathematics to Biochemistry. Our presentations were successful, and we were able to capture the student's and teacher's attention. Particularly, teachers were very thankful that there were enough resources in our website to help students in the data analysis process which could also help students in their daily assignments. In our presentations we made special emphasis on the data analysis guides as well as presentation guides since these were the categories where we saw more lack of skills when we judged science fairs at the beginning of the semester.

Also, our group presented to over 50 Chicago Public High School teachers, who gave us some invaluable feedback. Part of their feedback was to make a link to some other websites; one designed for high school students in Evanston, IL, and one designed to help students with the APA format (the standardized format of writing a Science Fair paper) on the written portion of their Science Fairs. The teachers also gave us their contact information and provided us with quality feedback through taking survey on our website.

The team was also able to distribute a student-targeted brochure for the City Wide Science Fair at the Museum of Science and Industry. By distributing these, we hope the students could take advantage of the resources we have in our website. Students can improve their oral presentations and display boards. We believe these kinds of tasks will continue to come up in the future. It is then important that the team acts on these tasks right at the beginning of the semester so that it can spread the word about our website very quickly. Once a great number of students access the website, then some of them will inevitably tell their friends about our website.

Further, we were able to have enough and well presented deliverable materials such as brochures and business cards by the end of this semester. Previous semesters had such as materials as well. However, we tried to have an identification logo so that the teachers, students and parents could recognize our project by a particular design. We were also able to create a filter quiz, as mentioned above, which enabled students to choose a particular science fair project. Our IPRO 330 is rapidly gaining momentum. We have to let as many as we can know about our project. It takes perseverance and patience to do this since communicating with external links sometimes is difficult.

We believe that throughout the semester, our group did an outstanding job at communicating both externally and internally. As it has been described in previous paragraphs, we have been able to spread the word to CPS teachers, principals, and students. We also can mention the IIT Engineering Week, in which our group was present and showed the work done to parents and students attending the event. Parents showed interest in our project since these saw the need for more exciting and challenging projects for their kids. We were very motivated and enthusiastic about serving teachers, students, and parents by providing them with resources available at our website. CPS

teachers, students and parents were able to have access to our website anytime and anywhere; this was very important.

By using analytics in Google we were able to see an increase in visits to our website. This means that we did a very good job at spreading the word through our meetings, talks, and presentations. We believe that making contacts with external people made our project successful.

We were able to update previous website with current needs for CPS. Ms. Angela Dumas was a very good influence for our project since she gave us a very constructive feedback. From this, we embark onto changing and updating presentation and data analysis guides. We also were able to create a safety guide, which was much needed.

Internally, our group communicated very well. Sub-team leaders communicated to Anthony Parrillo on a daily basis to update him with most recent work. All members, communicated via email as well. This way, all members of IPRO 330 were aware of updates, changes, and current work. This was very effective because, once we had our weekly meeting, each member was able to contribute with feedback.

One of the difficulties the communication team encountered during this semester was to make teachers and student contribute their feedback to our project. One of the steps we took at solving this was to arrange visits to high schools. As mentioned above, we were able to visit Hubbard High School. This was the resolution for our problem about obtaining feedback from students. We were able to receive feedback from the students; they wanted more exciting projects! Also, we were able to resolve the communication problem with CPS teachers involved in the High School Transformation Project at IIT. The problem we encountered at the beginning of the semester was that most of the teachers involved in this project did not answer to our emails. We then found that Mrs. Maria Santiago was in charge of this program. She was contacted by Professor Fasshauer and Rocio Diaz. Mrs. Santiago suggested that we could give a talk to all the CPS teachers involved in this program. This talk was given on March 13, 2008 to more than 50 teachers. This was our resolution for this problem. We were able to collect contact information from the CPS teachers attending our presentation.

Ethical Behavior

IPRO 330's Science Fair website will provide a quality service to all Chicago Public School students, as well as maintain the integrity of the science fair system and its affiliates. In order for IPRO 330 to uphold this statement, many ethical issues were confronted and resolved throughout the semester. One of the main features of IPRO 330's website is a bank of diverse and unique science fair projects. Within the project team, there existed a pressure to publish as many projects as possible. Unfortunately, an associated risk would be to publish lower quality project. To overcome this issue, the project team set a reasonable goal on the amount of projects they hoped to complete. By setting the goal, pressure was taken off of the projects team and they were able to focus on creating quality projects.

When a group of people collaborate on a project, there are bound to be different opinions and ideas on what is best. As a group, IPRO 330 encountered this issue. A pressure that each member faced was to believe that their ideas and opinions were

superior to others, thus risking the loss of potential feedback for improvement. To prevent this issue from arising, the team leaders of IPRO 330 took deliberate action. Team members were encouraged to be open to others' ideas as well as to report any feelings of negativity amongst team members. The team leaders also facilitated class discussion ensuring that every voice was heard.

Acknowledgements

First of all, we would like to thank previous IPRO 330 team leaders and members for having a Chicago Public School contact list available for us to use this semester. This list was used for planning and organizing the communications team to make progress in contacting interested CPS teachers and other professionals. These people were contacted via e-mail. Some of them answered to our request for feedback, and we give special thanks to them and their efforts to make our website better.

Furthermore, this list was used to contact Mr. Eric Williams, who is a Postsecondary Specialist in CPS Area 23. Mr. Williams was very helpful to our project. At the beginning of the semester, Rocio Diaz (communications subteam leader) contacted Mr. Williams to ask him for feedback and arrange high school visits. They met on February 19, 2008. He was willing to help our IPRO 330 to set up visits to Hubbard, Kelly, and Curie High Schools. We were able visit Hubbard High School on April 4, 2008. The team was able to organize the visits to these high schools in advance and prepare possible deliverables such as brochures and quizzes for CPS teachers and students. For this we thank Mr. Eric Williams.

Additionally, Angela Pak, member of the communication team and co-leader of IPRO 330, was able to contact Ms. Angela Dumas, the City-Wide Science Fair Coordinator. Ms. Dumas helped our project by contributing constructive feedbacks on February 27, 2008. She advised us on the possible ways that we could help the CPS Science Fair Program. She contributed to the organization of our team. The meeting with her provided us with guidance towards the principal issues we needed to deal with. The focus then turned to the oral presentation guides so the students would have it before the city wide science fair. Ms. Dumas also suggested preparing a safety guide which will help students realize the precautions they need to take before conducting a project. Moreover, she advised us to have better data analysis guides. These feedbacks were crucial for our planning and organization. We are very thankful for the constructive feedback Ms. Angela Dumas provided us for the betterment of our project.

Furthermore, we would like to acknowledge Mrs. Maria Santiago, coordinator of Math and Science Education Program at IIT, for her support of IPRO 330. Mrs. Santiago was contacted by Professor Gregory Fasshauer and communications team leader Rocio Diaz. Mrs. Maria Santiago was very helpful at providing an avenue to establish more contacts with CPS teachers. On March 13, 2008, our group presented to a group of over 50 Chicago Public High School teachers, who gave us some invaluable feedback. Part of their feedback was to make a link to another science fair and writing source websites. This helped in our planning and organization as well. The teachers also gave us their contact information and provided us with quality feedback through filling out surveys in

our Science Fair Extravaganza website. We therefore thank Mrs. Santiago for making this time available for us to distribute the word among CPS teachers about our IPRO 330.

Finally, we would like to thank Christy Thomas, Digital Media coordinator for Science Fair website at University of Chicago, for her support and giving us the opportunity to have a possible collaboration in the future with University of Chicago. Ms. Thomas was contacted by Professor Michael Pelsmajer. We were able to discuss about a possible future between both science-fair projects. We discussed the possibility for having a link in their website, which could help our IPRO be more known among CPS teachers and students. They are currently working on their website and it is to be available by the end of this summer. They will be serving about 40, 000 teachers and students through out the Chicago area and near suburbs. This will be a very good avenue for us to be known. Therefore, we thank them for their future support.