IPRO 330
Spring 2008
2/20/08
Project Plan

Objectives

IPRO 330 has one clear and main purpose: to increase high school student interest in Science and Mathematics in Chicago Public Schools. This is a very lofty and broad goal, so IPRO 330 has chosen to use the Chicago Public School Science Fair program as a vehicle to achieve this purpose.

IPRO 330 is a continuing IPRO, meaning that we have a foundation and a base of work that has already been accomplished. As a result, one of the project goals of this team will be to obtain in-depth feedback from professionals within IIT, from Chicago Public Schools, and certainly from other professional education venues as well. Specifically, we will be looking to obtain feedback from the three most involved sources in high school students' lives: students, teachers, and parents. This may be the most vital part of our project, because we want to make sure that our projects and guides are of high quality and high interest to high school students.

IPRO 330 has an existing bank of Science Fair projects and guides which are located on the website sciencefair.math.iit.edu. In an effort to make our website more effective and more appealing, we will have team goals to create more Science Fair projects, and guides which will target areas that Chicago Public High School Students typically have trouble addressing, such as data analysis. We feel like the guides are a way to really implement more mathematics into the Science Fair program as a whole. In addition, there will be a group of students in our IPRO focused on improving the website and implementing new projects.

IPRO 330 will address these objectives by first having all members, including faculty advisors, attend and judge a Chicago Public School Science Fair. This will allow everyone working on this project to get a better sense of what we are working on, make some contacts with teachers and Science Fair Coordinators, and even get feedback from students who used the website as a resource for their project. After this initial phase, the group will break up into three teams, an infrastructure team, a communication team, and a project and guides team. In these sub teams, IPRO 330 will be able to more effectively deal with more specific issues that arise.

Background

IPRO 330 will be working closely with Chicago Public Schools, mainly at the high school level, in order to improve the Science Fair program. Chicago Public Schools educate students throughout the City of Chicago. Chicago Public Schools will 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 may also explore using other external partnerships such as the Chicago White Sox and the Museum of Science and Industry to foster new and exciting projects.

IPRO 330 has been working and is continuing to work on solving the poor quality of projects, poor presentation skills, and general lack of interest in the Science Fair program displayed by many Chicago Public High School Students. We have seen students have trouble finding an adequate project that piques their interest, without spending a great amount of money on possible resources. Also, students generally have trouble analyzing data and thinking about possible error that could have occurred in their results. The purpose of our projects and guides on the website is to address these common problems that we have seen and observed amongst Chicago Public High School Students.

IPRO 330 has seen a number of problems with the use of science, mathematics, and technology in current Science Fair projects. The first problem that we have seen is that students are having trouble finding a project that is interesting to them, sometimes simply because they do not know how to effectively use the internet to find a project of interest. Another problem is that students are unaware of how to effectively display data, such as in a graph, or more specifically, which graph to use. We have also seen a lack of concern with possible error in the statistics that are being collected for a majority of students. There have also been some general oral presentation and visual presentation flaws in most projects that we would also like to address.

As far as we can tell, there have been little or no efforts in the past to try to improve the Science Fair program, however we have become aware that there is a similar effort taking place at the University of Chicago. In the near future, 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.

There are ethical flaws that may be fixed by the implementation of this project. There are many projects that are completely executed, with the results and conclusions, posted on various website. It is very tempting for students to simply copy this data and paste it onto a display board. Obviously, this is not the point of the Science Fair program. Students need to be held accountable for their ideas and their projects, but at the same time may have trouble thinking of a project to do. This website will allow students to start thinking about possible projects or maybe even motivate them to use one of the listed ideas without having the project completely finished for them. As a group, we need to be careful that we are properly crediting those who have come up with various Science Fair ideas.

The societal costs of the current problem are huge. There is a lack of engineering and mathematics and science professionals in the United States today. Nearly every field involving studying mathematics or science 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.

This semester, we are planning on addressing all of the problems that I have mentioned. The first problem is that of students not being able to find a project that interests them. In nearly all cases, students who are interested in the project and want to complete it will do quality work and learn more overall from the process, because they will be more invested in the project. The idea of creating “Contemporary and Dynamic” projects is to create this interest to improve student learning. Specifically, we will be updating and revising our current project list as well as implementing around 10 new fully functional projects this semester. This is a major function of our project. In addition, we will be addressing problems from the mathematical and statistics side of the Science Fair project, the results. We will be putting a stronger emphasis this semester

on creating more detailed guides so that students will be able to effectively and accurately display their results in a chart or on a graph. We are also planning on having guides that will lead the students to thinking about possible error that could have occurred. Finally, we will be addressing how to effectively present one's project in an oral, written, and visual manner. All of our solutions will be implemented and updated to our website, sciencefair.math.iit.edu, so that students can use our website as their resource for the Science Fair project. In order to effectively complete these things as a team, we will be dividing into three sub teams: the communication team, the project and guides team, and the infrastructure team.

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.

All of our previous work can be seen on the website sciencefair.math.iit.edu. There one can look at our various projects and guides. One can also see current and previous IIT students who have worked on the project in the past, and are currently working on the project. People can give written feedback, or even take a survey! We invite anyone to see the work that has been completed, and will continue to be updated throughout the semester.

Methodology/Brainstorm/Work Breakdown Structure

The nature of this project does not give a clear cut end goal. However this provides unlimited potential and growth the project can achieve- the efficient aide for Chicago Public School students.

The important focus on developing our methodology is to ensure each step of the process is processed efficiently and timely to achieve maximum amount of work in the limited time period. In the previous semester of IPRO 330, we had formed ideas and had implemented them in the form of a website. However, it lacked means to measure success and credible feedback. Also it lacked one to one interaction with the students. Our goal this semester is to achieve improvement in previous works, and add new ideas to the previous work. This section of project plan states ideas for this semester and means for implementation.

IPRO 330 team is restructured to three new subgroups: Infrastructure team, project/guide team, and communications team. The infrastructure team manages technological aspects such as maintaining and upgrading the website. Project/guide team provides new project ideas and guide to be added, and also develop ideas for better aide for Chicago Public School students. Communications team manages contacts with Chicago Public School science teachers and others involved in Chicago Public District Science Fair for better advertising and feedback.

The main goal of the infrastructure team is to update and improve the website. The website of IPRO 330 serves as an important medium to communicate and aid students of Chicago Public School. Detailed list of tasked for the semester includes, (listed in order of priority):

1. Fixing bugs of existing website. (New version of survey, broken links, parent survey bug, etc.)

    - Current websites contains few problems that need to be fixed before new improvements can be made.

2. Restructure URIs.

    - Due to website address change, some URI are broken or hard to share. These URIs will be fixed and changed so that they can be easily shared.

3. Remove PDF files

    - PDF files have been shown to be inefficient way to communicate and makes web site harder to navigate. By implementing PDF files to website directly, navigation of website can be improved.

4. Ask a Scientist – implement scroll down list, and connection to ARC tutors

    - For most of students participating in science fair lack direct or individually tailored guidance. This implementation is aimed to provide students with more one to one help.

5. Establishing and implementing coding standards

    - Coding standard is essential for website with changing mangers. This will ensure that the following semester members will have easier time updating and managing the website.

6. Verification/Validations

7. Utilizing SVN (Version tracking system)

8. Adjust resolutions to be more widely compatible.

The team also has continuing responsibility of updating new materials and working on improving aesthetics of website.
Project/Guide team is responsible for creating content that will aid Chicago Public School students. Main two goals are to create quality project ideas and guides that will aid students with science fair project. Tasks of project team can be largely divided into two categories- New Project Ideas, Development of Guides.

<u>New Project Ideas</u>

This semester the project team's goal is to add 10 new projects. This will increase the number of projects on the website by 150% giving students more wide variety of ideas.

To help students to use these ideas for their own project, project team is also developing new structure system, and standard format, and implements them. The existing projects will reviewed and newly implemented under the new format.

Also, a mean for students themselves to share their own project ideas are expected to be developed.

Development of Guides

While the old website has existing guides, there are improvements to be made. Areas that need improvements have been determined early this semester by participating as judges in Chicago Public School science fair (Area 21, 23).

A new addition to current guide will be focused on presentation, and error analysis. The website currently has oral presentation guides and video. These guides will be revisited and updated to be more effective for students. The error analysis will be newly implemented and proper part of error analysis will be linked to the projects and visa versa.

Also, over all re-examination of old guide will be carried out to provide better high school level guide for students.

Communication team is to serve as channel of communication between students and teachers, and our team. They maintain and expand contact for feedback and advertising. Their list of plans for this semester is, (listed in order of priority)

1. Obtaining Feedback
    - Previous feedback system was inefficient and did not provide sufficient feedback. The communication team will be developing new feedback system such as school visits.
2. Contact Database
    - Constant communication with CPS personnel will be maintained to update the project status, and help them to be involved in out project.
    - Update emails will be sent every 2-3 weeks, and a log will be kept to prevent redundancy.
    - Current list will be organized.
3. Advertisement
    - New effort to advertise out project through school libraries and etc.
4. School Visits
    - Efforts will be made to organize 2-3 school visits along with CPS visits.
5. Make internal connections
    - Make contacts with existing projects in IIT

Expected Results

The main expected results are increase in exposure and aid to Chicago public school students. Main problems that need to be fixed are lack of one to one help, and feedback. Tasks this semester are expected to fix precious problems and enhance overall quality of IPRO 330 project.

One of the main expected improvements is quality of our website. The addition of information and new organization is expected to provide wider range of information, and facilitate the usage of website. The improvement on the website will provide more comprehensive aid. Infrastructure team's effort on making website more compatible including, rescaling, improvement and aesthetics, removal of broken links will enable larger population to access the website easily.

Also the new structure of project idea is expected to encourage students to not only participate, but to examine their projects in deeper level. This is intended for students to develop interest in science through the process too. The improved organization of work will enable students to access the website to its maximum capacity. Over all improvement on the website will enable more effective communication between students and our project team.

Another expected result of this semester is improvement in quality of aid. This is expected to help students directly, and make bigger impact on quality of science fair project. In spite of the existence of our precious website, it was hard to tell to what degree this website is really making an impact. More accurate understanding of the situation will be obtained through, increased outside of the website interactions with students, and two way conversations provided using class room visits, and ask a scientist.

The last but one of the most important expected result is increase in visibility of the project. Our new contact system with increase in frequency is expected to develop recognition with teachers in Chicago Public High school. Also school visits will give a chance to create credible face to our project. Other advertising efforts will also help include number of students we can reach out to.

Project Budget

Our budget is very simple, because we do not have any financial sponsors, nor do we require a lot of operating funds as well. There is not much planned need in terms of expenditures or income opportunities. However, we do have some operating and miscellaneous costs. At the beginning of this semester, our budget contained $192. Here's a breakdown of how we will be using the money:

Items	**Cost**	**Purpose**
Business Cards	<$37>	Helps to obtain feedback
Materials for project testing	<$50>	Make better projects by testing them
IPRO Day	<$50>	Another feedback opportunity
Miscellaneous Costs	<$55>	Anything that may arise
Total Expenditures:	<$192>	To run and maintain IPRO 330

Again, we don't foresee other unnecessary expenditures, especially ones that would be high in cost. We may not even need the entire budget as some of the costs are miscellaneous in nature. We would like to explore opportunities to get potential sponsors for our IPRO project.

Schedule of Tasks and Main Events

ID	Task Name	Duration	Start	Finish	Predecessors
1	IPRO Deliverables	##########	Wed 1/23/08	Fri 5/2/08	
2	Project Plan	46 days	Wed 1/23/08	Fri 2/22/08	
3	Code of Ethics	66 days	Wed 1/23/08	Fri 3/7/08	
4	Midterm Oral Presentations	68 days	Wed 1/23/08	Mon 3/10/08	
5	Midterm Written Report	76 days	Wed 1/23/08	Fri 3/14/08	
6	Meeting Minutes	126 days	Wed 1/23/08	Fri 4/18/08	
7	Abstracts, Posters, and Presentations	136 days	Wed 1/23/08	Fri 4/25/08	
8	IPRO Day	146 days	Wed 1/23/08	Fri 5/2/08	
9	Infrastructure	##########	Wed 1/23/08	Fri 4/25/08	
10	Implementation	136 days	Wed 1/23/08	Fri 4/25/08	
11	Testing	136 days	Wed 1/23/08	Fri 4/25/08	
12	Astetics	136 days	Wed 1/23/08	Fri 4/25/08	
13	Ask a Scientist	72 days	Wed 3/5/08	Wed 4/23/08	
14	Fix Bugs	42 days	Wed 2/20/08	Wed 3/19/08	
15	Cleanup URIs	52 days	Wed 1/23/08	Wed 2/27/08	
16	Get rid of PDFs	40 days	Thu 2/28/08	Wed 3/26/08	15
17	Coding Standards	40 days	Thu 2/28/08	Wed 3/26/08	15
18	Verifications/Validations	30 days	Thu 3/27/08	Wed 4/16/08	16
19	SVN	30 days	Thu 3/27/08	Wed 4/16/08	16
20	Build Process	42 days	Wed 3/26/08	Wed 4/23/08	
21	Scalability	42 days	Wed 3/26/08	Wed 4/23/08	
22	Project and Guides	##########	Wed 1/23/08	Wed 4/23/08	
23	Projects	##########	Wed 1/23/08	Wed 4/23/08	
24	New Categorizing system	62 days	Wed 1/23/08	Wed 3/5/08	
25	New Standardized Format	32 days	Thu 3/6/08	Thu 3/27/08	24
26	Old Projects - Review	32 days	Thu 3/6/08	Thu 3/27/08	24
27	New Projects	44 days	Tue 3/11/08	Wed 4/9/08	
28	Post Your Own Project	30 days	Thu 4/3/08	Wed 4/23/08	
29	Guide	##########	Mon 2/11/08	Wed 4/16/08	
30	Oral Presentation Outline	46 days	Mon 2/11/08	Wed 3/12/08	
31	New example video for oral presentation	30 days	Thu 3/13/08	Wed 4/2/08	30
32	Revise old guides to be more highschool frien	30 days	Thu 3/13/08	Wed 4/2/08	30
33	Error Analysis	72 days	Wed 2/27/08	Wed 4/16/08	
34	Communications	##########	Wed 1/23/08	Wed 4/30/08	
35	Get Feedback	132 days	Wed 1/23/08	Wed 4/23/08	
36	Manage Contact Database	92 days	Wed 1/23/08	Wed 3/26/08	
37	Advertisement	62 days	Wed 3/5/08	Wed 4/16/08	
38	School Visits	58 days	Fri 3/14/08	Wed 4/23/08	
39	Make Internal Contacts	99.75 days	Wed 3/12/08	Wed 4/30/08	
40	Office of Community Development	42 days	Wed 3/12/08	Wed 4/9/08	
41	ARC	42 days	Wed 3/12/08	Wed 4/9/08	
42	Tutoring in the HUB with highschool students	30 days	Thu 4/10/08	Wed 4/30/08	40,41

Please see the attached IPRO 330 Spring 2008 MS Project Plan.mpp for more detailed information about our project plan using Microsoft Project software.

Individual Team Member Assignments

Team Members	Year/Major	Strengths
Leah Baldwin	3rd Year Biomedical Engineering	Projects/Guides
Keith Campbell	4th Year Electrical Engineering	Website
Rocio Diaz	3rd Year Chemistry	Projects/Contacts
Yewon Gim	4th Year Physics	Science Fair Exp.
Angela Pak	3rd Year Molecular Biochemistry and Biophysics	Leadership
Anthony Parrillo	4th Year Applied Mathematics	Leadership
Shane Steward	4th Year Computer Science	Website/Projects
Joshua Tate	3rd Year Applied Mathematics	Contacts/Website
Patrick Ten Eyck	2nd Year Applied Mathematics	Projects/Guides
Aimee Totleben	3rd Year Applied Mathematics	Projects/Guides

Team Leaders:

The team will be led by Anthony Parrillo and Angela Pak. Both of these students have been in IPRO 330 previously, with Anthony having experience as a co-leader of this project previously. These students will be responsible for coordinating the sub teams, making sure that sub team leaders are reporting in to them, and considering all aspects of this project before providing vision for it. Anthony Parrillo and Angela Pak will also be meeting weekly with Professors Fasshauer and Pelsmajer (Faculty Advisors) to get feedback on their plans and to make sure that they are covering all aspects of the project that need to be addressed at upcoming meetings.

Sub Teams:

Our team has broken into three sub teams, the infrastructure team, the projects/guides team, and the communication team. The infrastructure team consists of Keith Campbell, Shane Steward, and Anthony Parrillo. The projects/guides team consists of Patrick Ten Eyck, Aimee Totleben, Yewon Gim, and Leah Baldwin. The communication team consists of Josh Tate, Rocio Diaz, and Angela Pak. All members of each of the sub teams will not be given a certain "task," rather we will work as a team and accomplish things as needed for the betterment of the team as a whole.

Sub Team Leaders:

The leader of the infrastructure team is Keith Campbell. The leader of the project/guides team is Patrick Ten Eyck. The leader of the communication team is Joshua Tate. These sub team leaders will be held responsible for the execution of the plans and the production of the deliverables.

Sub team Responsibilities:

The infrastructure team is responsible for maintaining, improving, and implementing new projects and guides to the website. The projects/guides team is responsible for reviewing old

projects, improving them, and creating new projects that are contemporary and dynamic for Chicago Public High School Students. The communication team is responsible for maintaining external contacts with Chicago Public High Schools and with other professional and paraprofessional organizations in order to gain insightful feedback from students, teachers, and parents. All sub teams will be responsible to communicate with one another when receiving this feedback, because it will be necessary for everyone to hear what changes or plans we need to make on this project.

Designation of Roles

Meeting Roles:

A. Minute Taker: Anthony Parrillo in conjunction with Angela Pak will be taking down the meeting minutes for all meetings. Because we are the team leaders, it is important that we are taking down the information so that we are able to have a clearer vision of the broader goals that the sub teams are working on. Anything written on the board should be reviewed constantly so that we can have a better idea of what changes in plan we may need to take with the project as a whole.
B. Agenda Maker: Again, Anthony Parrillo and Angela Pak will be responsible for making an agenda for the upcoming meetings. They will be meeting weekly with Professors Fasshauer and Pelsmajer (faculty advisors) to make sure that the meeting agendas are efficient, covering urgent and important topics, and guiding the project in the direction that it should be going.
C. Time Keeper: Angela Pak will be responsible for keeping the time to make sure that we are able to cover all the necessary topics and make adjustments if necessary.

Assign Status Roles:

D. Weekly Timesheet Collector/Summarizer: This position will be broken into three jobs by three separate people, the subgroup leaders. Each subgroup leader will be responsible to make sure that their subgroup is on task and accomplishing tasks according to the timeline.
E. Master Schedule Maker: This position will also be broken into three jobs, because there is really no pertinent need for the entire team to meet as a whole outside of our normal meeting time. The subgroup leaders will be responsible for finding a time for their sub team to meet up every week outside of the scheduled IPRO time slot. If it comes up that we need to meet outside of class as a whole team, such as before IPRO Day, then we will corporately discuss the best meeting time at the appropriate scheduled IPRO meeting.
F. iGROUPS: Anthony Parrillo will be making sure that everyone is able to communicate with the iGROUPS tool. He will field any and all technical questions, give a brief iGROUPS usage seminar during the first IPRO session, and forward any difficult questions to the IPRO office.