IPRO 301

Researching, Designing, Testing, and Evaluating

IPRO Program Enhancements

Spring 2008 Project Plan

Team Members:

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1.0 Objective

IPRO 301 has the following objectives:

- Find a relationship between problem context and reflective thinking in order to understand if service-learning projects promote reflective thinking more than other types of projects.
- Determine the effectiveness of groupware on learning outcomes through research, design, and data analysis.
- Determine the effectiveness of IPRO Games on team functioning.
- Create an IPRO enrollment forecast, with seasonality and regressional analysis, for the upcoming semesters.
- Evaluate and determine if the development of a Code of Ethics, by students, leads to the development of ethical behavior.
- Identify and develop an effective method to improve inter-rater reliability for IPRO Day judging at IIT.
- Develop the innovation and design learning objectives, as well as improve student attainment of said learning objectives.

2.0 Background

The IPRO program at IIT, since its inception in 1995, has become a signature program of the school for it not only benefits participating students but also the corresponding sponsors and prospective employers of IIT graduates. During a student's participation of an IPRO, he/she is engaged in a multi-discipline, team-based learning environment to solve a real-world problem proposed by industry sponsors and/or IIT faculty. Additionally, the program is designed to allow students to develop and apply their teamwork, project management, communication, and ethical behavioral skills. Each semester, the projects courses offered change depending on the emerging social and technological trends in today's world.

In creating a continuous effort in enhancing the program experience for its participants, seven issues associated with administering, analyzing and evaluating the program's effectiveness have been identified: 1) reflective thinking and its relationship to the problem context faced by individual IPRO project teams, 2) the effectiveness of groupware (i.e. iGroups) on team and individual achievements of learning outcomes. 3) IPRO games participation and its effect on team functioning, 4) IPRO enrollment and its dependency on seasonality and other factors, 5) IPRO program's enforcement of Code of Ethics and its relation to the level of ethical awareness amount participants, 6) the accuracy of IPRO day judge and subsequent methods to reduce inter-rater reliability, 7) effectively teaching and incorporating design methodology into the IRPO program through the establishment of learning objectives. With the amount of investments and resources made by IIT and related individuals and organizations, it is essentially that for the issues to be

tackled as the continual success of the program directly affects the school and IPRO office's reputation and the incoming of potential resources.

Created for the purpose of addressing and solving the seven issues mentioned, team IPRO 301 has been enlisting a variety of technology and science-related methods analysis to further identify and understand the problem. For instance, literature reviews have been conducted on information collected on various professional and scientific databases, such as PsychInfo, JSTOR, and ASEE, etc. Statistics related software such as SPSS have been used to support and conduct mathematical data analysis to accurately correlate the problem identified and the variables affecting it. Furthermore, various research methodology, findings, and intervention designs have been recorded, conducted and tested to foster the enhancement of the IPRO program.

Prior to the establishment of this IPRO in Fall 2006 (previously named as IPRO 400), the IPRO program only had four general learning objectives, inadequate literature reviews, and inconsistent learning objective study guides. Credits to the research done by the IPRO 301 team in Fall 2007 and by various IPRO scholars, a series of interventions has been carried out. Five new IPRO learning objectives have been formulated with one new learning objective customized for EnPros. A study text was also identified and applied for IPRO ethics with two semesterly presentations by the book's author. One of the five new deliverables mentioned is directly related to the team-collaboration in coming up with a code of ethics, which has proven to help IPRO project teams examine the ethical issues attached to their particular IPRO therefore can possibility results in a change of ethical awareness. Comprehensive IPRO games were designed to increase team effectiveness and communication in the critical first five weeks of IPRO. Project management workshop was set up to effectively help teams raise their project plan grades and students become aware of the importance of project management. Additionally, an end-of-the-semester feedback form was designed and implemented to stimulate reflective thinking in students. The functions on iGroups have also been continuously developing and improving to encourage intra-team communication and to document the progress of all teams.

During the process of intervention design, testing and evaluation, each intervention is continually assessed and modified using statistical analysis and pre- and post- measures such as student, faculty and alumni surveys. Therefore, interventions that have been assessed as unsuitable, such as the reflective thinking intervention, were subsequently abandoned.

An ethical concern of IPRO301 is the testing on human subjects. As a result, all parts of the research must be certified by the IRB and participant consents are collected. If a team chose not to cooperate, coercion will not be used to implement system assessment. Various student and faculty attitudes are also encountered and treated as a barrier by this IPRO team. For example, the collection of pre- and post-test

scores of the learning objective tests is essential in evaluating their effective. However, some faculty overlooks the importance of the tests and thus results indifference in the students taking them. Such a situation poses a difficult problem for the team and makes it impossible to assess the intervention accurately.

The IPRO 301 team of Spring 2008 aims to continue on the progress on implementing practical solutions for the seven programs stated. Further literature reviews will be conducted to verify and validate previous assessments and more appropriate interventions are expected to be designed and implemented. Thorough data analysis will be conducted when seem fit. The team will also research for similar solutions to the problem previously implemented and correspond with national and international organizations. The entire progress and complete results will be documented and served as record to future IPRO 301ers.

3.0 Methodology

To best achieve the goals listed in Section 1.0, the seven subteams of IPRO 301 will apply suitable research methodology, which will vary slightly from subteam to subteam shown as follows.

3.1 Reflective Thinking Subteam

The reflective thinking subteam addresses finding a link between reflective thinking and IPRO service-learning projects. Although there has been considerable research done on both service learning and reflective thinking, there is only a handful of empirical evidence to suggesting that one promotes the other.

If the literature search yields evidence that there is a positive correlation between service-learning and reflective thinking, then the reflective judgment scores of the students in the service-learning IPRO's should show that they have developed a higher level of reflective thinking than the students who were not enrolled in the service-learning projects. Professor Huyck and Elizabeth Howard, along with previous IPRO 301 students, have previously developed a written method for analyzing reflective thinking. The level of reflective thinking of the student is then analyzed and assigned a level of reflective judgment. If the analysis of the data concludes that there is a link between service learning projects and higher reflective thinking, then it will be suggested that there are more service-learning projects incorporated as soon as possible to benefit the student's reflective thinking skills. The subteam will keep a clear record of all of the data in both a written and electronic format via iGroups to ensure that the information can be passed along to the next researcher.

Analysis of the reflective judgment test results will be analyzed in SPSS software with help from graduate students if necessary. Our hypothesis is that there will be a positive correlation between participation in a service-learning IPRO and a student's reflective judgment test score. This would indicate that service-learning may be a more effective method of encouraging reflective thinking in students. If there is not a significant correlation, then service-learning would appear to be as affective as regular IPROs at encouraging reflective thinking; the suggestion might be made that service-learning projects need to re-evaluate their methods for approaching their problem contexts. This sub team is also responsible for one third of the midterm presentation, IPRO Day Exhibit, and assisting team members on any other formal IPRO deliverables. Formal tasks for IPRO Day deliverables have not yet been assigned to any subteam.

3.2 Groupware Subteam

The groupware subteam is examining if the use of groupware affects certain outcome measures, and, if so, why and by how much. The groupware suite being evaluated is iGroups, which was specifically built to enable undergraduate project teams to collaborate on multidisciplinary projects. However, the problem this subteam faces is how to determine the correlation between groupware suite and learning objectives in undergraduate project teams because there is a definite lack of research in this very specific area. From the groupware suite, iGroups, Angela will accumulate the usage data such as the number of e-mails sent and files uploaded by each student. This data has been collected for previous semesters and measures how often a student uses the suite. Then she will analyze the data and correlate it to each individual's IPRO performance. Angela will also do a substantial amount of research on groupware to learn of any past experiments and to establish its effects on individuals.

The correlation of whether the use of iGroups and each student's IPRO performance will determine the groupware's efficiency. Student opinions about iGroups and its effectiveness will be also assessed through surveys. This data will be correlated to objective attainment in other IPRO assessment measures.

All documents used in this researching process, including Angela's research on groupware, her literature review and data analysis, will be recorded in iGroups/iKnow for continuing semesters to access it at any time.

Analysis will be done through Microsoft Excel and statistical software such as SPSS with the aid of graduate students or the Psych Service Center. Informal colloquial opinions will also be solicited to compliment formal surveys and test results. This subteam is also responsible for generating the midterm report and will assist team members on any other formal IPRO deliverables.

3.3 Teamwork Subteam

The problem of the teamwork subteam is that while we know that teamwork games improve teamwork, IPRO Games to not seem to have a long-term effect on the functioning of IPRO teams.

To solve this problem, Margaret will be conducting a review of the literature. This review will consist of mainly of articles and dissertations found on PsychInfo among other sources. In addition, Margaret will speak with experts in the field of organized team games. The purpose of this is not only for anecdotal information and strategies but also to gain more information and resources. This research, which will be done by midterm, will be documented in the form of a notebook and iGroups. The notebook will be given to the advisors at the end of the semester to be passed down to the next semester. It will contain all the information necessary to follow the path of the previous person, including search terms, potential sources, and articles. Articles obtained in digital format will be stored in iGroups. The results of Margaret's literature search and expert sources will be compiled into a report which will contain a recommendation to the IRPO Program on ways to improve IPRO Games.

The recommendation will be implemented into the Fall 2008 IPRO Games for testing. Margaret hypothesizes that her recommendations will be minute adjustments to the program and will not need extensive testing; they should fit into the current IPRO Games framework. Analysis of the implementations will be measured through current measures of teamwork functioning used by the IPRO Office. Because the implementation is outside the scope of this semester, there will be no assignments to the subteam regarding testing, implementation or conclusions.

IPRO deliverables for this subteam will be submitted in the form of a paper as well as contributions to midterm reports, final reports and IPRO Day events.

3.4 Forecasting Subteam

It is very important for a program such as IPRO to have a good forecasting model in place to enable them to plan efficiently. The forecasting subteam is responsible for creating a forecasting model that will accurately predict IPRO enrollment for the coming years. The responsible subteam member, Hannah, will begin by performing a literature review to collect relevant information on how to perform forecast analysis.

The knowledge gained about the forecasting process will be used to create a program that will perform the desired mathematical processes on the data. This program will generate forecasting models for two academic years. The subteam will then collect the updated enrollment information and enter this

information into the data bank. The forecast modeling program will then produce to desired forecasts using both seasonality and regressional analysis.

The forecasting subteam will also work on any relevant deliverables, including the midterm presentation. All of the information generated and any programs created will be store in igroups for future use. It will also be stored in the subteam member's IPRO notebook.

3.5 Ethics Subteam

The developing issue of unethical behavior in professional practice, whether for business, medicine, politics, et. al. has raised the concern of the formation of ethical behavior through education. Especially in the formative college years of undergraduate studies. This leads to the question of how to teach ethics and how to measure the learning of ethical behavior with the problem being more specifically stated as whether or not ethics is being taught in schools and if it is, how effective that teaching is, and what can we do to improve it.

That being stated, the research compiled will be drawn from independent studies and various universities, and communities, including domestic and international, centering on how these universities conduct their ethical education, if any, and what impact these programs have on students ethical awareness.

The expected data from this research is expected to be primarily qualitative in nature as one of the major hurdles to analyzing ethical learning is the heavy maturation factor. The proof of ethical education sometimes doesn't manifest itself until sometimes, years after the fact. There will be some quantitative data to gather, but not much.

Also involved will be a comparative analysis of Code of Ethics, held to by various professional fields, such as Engineering, Architecture, and Medical fields, for example.

This information will be collected and documented by use of the iGROUPS groupware and file storage program, as well as written records. This information will be evaluated and presented at the end of the semester through a written literature review.

3.6 Inter-rater Reliability Subteam

The problem faced by the inter-rater reliability subteam is the emergence of inter-rater reliability (IRR) when humans are utilized as the measuring instrument, such as that on IPRO Day. IRR is the extent to which two or more individuals/raters/judges view a same phenomenon/object but don't agree on the same opinion/score. It also assesses the consistency of how a rating system is implemented. Therefore, it is

important for the IPRO program at IIT to develop a comprehensive enhancement on its IRR and thus allow an accurate measure of the program outcomes.

To solve this problem, this subteam will first become familiarized with the previous work done on IRR. Jonathon Beagley from Fall 2007 had already written an algorithm in calculating the IRR for the IPRO day judging data from Spring 2007. He also identified several key references in literature reviews to gain understanding of the concept of IRR. Using the existing algorithm, further data analysis will be conducted on all existing IPRO Day judging data. The results from the analysis will be correlated to the type of past interventions attempted to enhance IRR in order to evaluate their subsequent effectiveness.

Secondly, the subteam will also conduct extensive literature reviews on possible methods of improving IRR. All researched methods will be thoroughly studied with the IRR analysis results to seek the optimum intervention for IIT's IPRO Day judging. The possible use of SPSS, the statistical software will be investigated to explore its function relating to IRR. And finally, the subteam will recommend and develop an intervention program to be implemented by IPRO personnel.

All research and analysis conducted will be documented and archived in two locations: iGroups/iKnow, allowing access to anyone who wishes to see the work that has been done, and the other being the subteam's project/research notebook, which would be electronically published and available in print. This subteam is also responsible for the team's meeting minutes, and will be helping with the final report.

3.7 Learning Objectives Subteam

The learning objectives subteam faces how to teach students the concepts of innovation or design during their IPRO experience. These learning objectives were recently added to the IPRO learning objectives (LOs) and do not currently have test banks, study guides, interventions, assessment measures, or grading rubrics. As part of this IPRO, Carolyn will use identified bodies of knowledge to produce question banks for these two LOs, pilot the questions during the LO pre- and post-tests, and make revisions as necessary. She will also write appropriate study guides for students to be posted on the IPRO website and begin work to develop an intervention aimed at increasing student performance on one of these learning objectives.

The LO test questions will be run as un-graded pilots during the pre- and post-tests to collect preliminary data on student performance. Based on the results, questions may be reworded, modified, or deleted as necessary. Statistical tests may also be run on the questions to determine if subtler effects are at work (similar work has been conducted during previous semesters of this IPRO). Study guides will be put through a peer review process and the intervention outlined in sufficient detail that a pilot test may be run

either late this semester or next semester. Student opinions on the intervention will be assessed and surveys used. This data will be correlated to objective attainment in other IPRO assessment measures.

Analysis will be done through statistical software known as SPSS with the aid of graduate students or the Psych Service Center. Informal colloquial opinions will also be solicited to compliment formal surveys and test results.

All documents used in this research will be recorded in iGroups for continuing semesters. Completed test questions are integrated into the existing IPRO learning objectives test and study guides posted on the internet for student access. Interventions will be detailed and plans recorded and given to the proper facilitators. Additionally, compilation documents will be recorded on iGroups that provide quick access to where to find all of this information. This subteam is also responsible for producing the project plan and will assist team members on any other formal IPRO deliverables.

4.0 Expected Results

4.1 Reflective Thinking Subteam

The reflective thinking subteam expects to find a relationship between reflective thinking and service-learning projects. Additionally, a literature review will be undertaken to determine the most effective ways of improving reflective thinking, including problem context. This information will be used as evidence to suggest more service-learning IPROs and a possible product to promote reflective thinking for all aspects of life. Potential outputs include preliminary analysis of reflective judgment tests and problem context as well as literature that can be referenced for future papers.

Final deliverables of the project will include literature and a literature review to aid in the creation or improvement of IPRO. Other deliverables include a paper to be submitted to either Frontiers in Education (FIE) or American Society for Engineering Education (ASEE), and any necessary IPRO deliverables.

It is anticipated that the products of this sub team will greatly increase the learning experience of the rapidly growing IPRO project. It will not however, greatly disturb the progress of the current projects that are doing so well. It will provide information that will aid in the selection and formation of new IPROs. The product of the sub team will hopefully enhance the reflective thinking skills of the incoming IPRO students. IPRO 301 has several diverse subteams, but they are all working together to improve and enhance the IPRO program and the results it produces. The students are at the foremost of considerations because they are the product of the program. Their success is, in part, a reflection of the IPRO program's success.

4.2 Groupware Subteam

Due to the lack of research in the specific area of groupware, the groupware subteam hopes to find substantial evidence of groupware's effectiveness in learning. Through data analysis she expects to find the usage of groupware in high positive correlation to an individual's performance in IPRO. With the confirmation concluded from the data analysis, IPROs in the upcoming semesters will use iGroups to its fullest potential in hopes of a greater performance.

Additionally, a literature review which includes sources and references relating to enhancing groupware's effectiveness on learning outcomes through empirical studies will be provided by this sub team. Potential outputs include preliminary analysis of any data from spring semester of '08 as well as literature that can be referenced for future papers.

Final deliverables to the project will include data analysis, a literature review to help conclude the effectiveness of groupware on learning outcomes, a paper to be submitted to American Society for Engineering Education (ASEE), and any necessary IPRO deliverables.

It is expected that the products of this sub team will address the problem of the sponsor (the IPRO program). This sub team is attempting to enhance the usage of iGroups and through research and analysis compilation will prove it's necessary for a great IPRO performance. No significant changes to the IPRO program are expected, only the conclusion on whether groupware affects certain outcome measures.

4.3 Teamwork Subteam

The teamwork subteam's expected results will include a comprehensive review of the literature on the subject of team games and a final paper that includes an analysis of the literature and recommendations as to how to improve the IPRO games.

Margaret hopes that her review of the literature will include reasons why team games work in improving team functioning. She also hopes to find best practices in conducting team games which would include a comparison of IPRO Games resulting in possible new methodologies to improve the games.

Her results should address the need of the IPRO Program which is to expedite the stages of team development so that teams can start working faster and more efficiently. She expects that the results will fit with very few problems within the current framework. The results may yield small changes in the

process or implementation or they may require a complete overhaul of the current program. It is most likely, however, that the changes will be minimal and easy to implement.

4.4 Forecasting Subteam

It is expected that before the midterm, an IPRO enrollment forecast will be established for the fall semester. It is also expected that a program will be created to take in past enrollment data and will calculate forecasts.The program will use both seasonality analysis and regressional analysis. These forecasts will include predicted enrollment for the next two academic years. After the midterm, the subteam will look at overall sophomore enrollment and perform regression overall enrollment versus IPRO enrollment.

The resulting deliverables from this project are as follows: it is expected that a system will be established that will create models for the next two academic years, and will make future forecasting simpler. This will fulfill what has been requested by the IPRO department. The IPRO office will use the forecast information to plan for an appropriate number of IPROs in future semesters. This will help the program create an adequate number and adequate types of IPROs for future semesters.

A literature review dealing with forecasting with seasonality and regression will also be completed. This will help those trying to understand the process have a clear picture of the forecasting process.

4.5 Ethics Subteam

The expected development of this project will lead to the formation of an accurate measurement of the development of ethical awareness in undergraduate students. This includes the formation of a test that will be used to measure ethical awareness in IPRO students, with the objective to refine and enhance our program.

This would take the place of an intervention at the end of the semester. The type of test involved would be qualitative in nature, requiring the students to compose answers to relevant examples of current ethical dilemmas. Being able to correctly, or incorrectly, identify and dissect these events will assist in the formation of a certain baseline in order which to further develop an accurate assessment. These findings will be documented via groupware and the end of semester literature review.

A successful development of this test will enhance the marketability of IIT students by participating in a substantiated ethical development program.

4.6 Inter-rater Reliability Subteam

The goal of the inter-rater reliability subteam is to improve the inter-rater reliability of the IPRO Day judging procedure. The focus will be on identifying and developing a feasible method to be used by the IPRO office.

One of the results this subteam hopes to achieve is analyzing and providing complete results of all of the IPRO Day judging data from Fall 2005 to Fall 2007, a total of five semesters. A comparison of the results by semester will be made and will provide evaluation of the interventions conducted during each semester. A literature review summary will also be produced as a result of the subteam's work, on which will include sources and references relating to enhancing IRR through empirical or quasi-empirical studies.

This subteam will be also responsible for the submission of a paper to FIE, the compilation of the project plan, and the final report/grant proposal. Final deliverables to the project will include a comprehensive recommendation on an intervention program. It is anticipated that the program will approach the problem from computational and social approaches (for example: a mathematical model to improve reliability, as well as increased judging training) to effectively improve the IRR of the IPRO Day judging procedure. The new designed program will likely include modifications to the existing intervention programs and IPRO framework, but it is unlikely that these changes will cause implementation problems.

4.7 Learning Objective Subteam

Because of the foundation nature of developing two new LOs, little of the data will be available for analysis and results before the end of the semester, but will be left for future IPRO301 teams. Two learning objectives will be implemented, complete with test questions and study guides. One of either design or innovation will hopefully have a completed and ready to test intervention to increase student attainment of the learning objective. The test questions will be analyzed and improved as much as possible, and surveys and framework established to assess the new material.

Obvious products of this subteam's work include the completed test questions, study guides, and the intervention. Additionally, a literature review will be undertaken to determine the most effective ways of teaching design and innovation; this information will be used in the creation of the intervention. Potential outputs include preliminary analysis of the new learning objectives test questions as well as literature that can be referenced for future papers.

Final deliverables to the project will include, as mentioned, the two learning objectives test banks, appropriate study guides, and one intervention. Other deliverables include literature and a literature

review to aid in the creation or improvement of interventions, a paper to be submitted to either Frontiers in Education (FIE) or American Society for Engineering Education (ASEE), and any necessary IPRO deliverables.

It is expected that the products of this subteam will not only address the problem of the sponsor (the IPRO program) but also help solve it. Not only is this subteam working closely with directors of the IPRO program, but the test questions and study guides are being built within the existing learning objectives framework and definitions. They will meet all the definition criteria and follow the structure used on all existing learning objectives. Since the combination of polished, assessed test questions with quality study guides, an outside resource such as a book or recognized website, and an intervention has been shown to increase student performance and attainment of the learning objectives, and this project is being constructed in a similar manner, it is expected that it too, after some testing and polishing, will accomplish the same feats.

As mentioned, the existing IPRO framework and definitions for learning objectives has been considered from the start of this project and the new learning objectives will be easily meshed into the existing system. No significant changes to the IPRO program are expected, only the implementation of a new and well-defined set of learning objectives, for which the framework is already in place. Since this is also a tested methodology for implementing learning objectives, and has been used successfully over the last few semesters to redesign the old learning objectives, after implementation and testing it is expected that these deliverables will easily meet the desired outcome of improving student attainment of learning objectives.

5.0 Budget

$1000	Paying intervention speaker/facilitator
$500	food and other intervention costs
$200	Purchasing of relevant papers
$100	Team dinner out

6.0 Scheduled Tasks and Project Milestones

This is included in the attached Gantt chart.

7.0 Individual Team Member Assignments

7.1 Task Assignments

*Bold indicates subteam leader

Name	*Major*	*Skills/Strengths*	*Subteam*
Bryant, Kristin	Psychology, political science	Experience with statistics, SPSS, and the research process, extensive literature and journal search skills	Reflective thinking
Gandhi, Angela	Psychology	Working knowledge of Microsoft programs and SPSS. Solid analytic and problem-solving skills.	Groupware
Kibilko, Margaret	Psychology	Leadership, Problem Solving, Knowledge of SPSS	Teamwork
Kolb, Hannah	Applied Mathematics	Strong mathematical background, drive and motivation to self-learn new techniques	Forecasting
Ptak, Treyson	Architecture	Working knowledge of Microsoft programs. Solid problem solving and research skills.	Ethics
Shi, Heling	Mechanical engineering	Engineering background, experience with the research process and strong analytical skills.	Inter-rater reliability
Wood, Carolyn	Physics	Strong analytical abilities, experience with statistics and the research process, third semester in IPRO301	Learning objectives

7.2 Subteam Responsibilities

Reflective thinking	Research and analyze the relationship between service-learning and reflective thinking.
Groupware	Research and collect and analyze data that will determine the effectiveness of groupware, such as iGroups, on learning outcomes.
Teamwork	Conducting a review of the literature and analyzing results to form a recommendation to the IPRO program on ways to improve IPRO games so that they will be more effective in improving team functioning.
Forecasting	Analyzing historical data from IPRO enrollment and using this information along with analysis of seasonality and regression to create a forecasting

	model for the use of the IPRO office.
Ethics	Collect, correlate and analyze the data gathered during research of ethics to further develop and improve ethical education in the IPRO program.
Inter-rater reliability	Identify and develop an effective method in improving inter-rater reliability for IPRO day judging at IIT.
Learning objective	Improving and defining the innovation and design learning objectives, creating appropriate study guides and an intervention. Additionally, this subteam will set an assessment framework so that future semesters will be able to evaluation and improve upon these deliverables.

7.3 Individual Member Responsibilities

Bryant, Kristin	Conducting the reflective thinking sub team, data analysis, some reflective judgment grading, literature review on the connection between reflective thinking and service-learning, peer-reviewed paper improvements. She was chosen for her experience in psychology and having a background in statistics, as well as an interest in critical thinking skills and educational psychology.
Gandhi, Angela	Conduct the groupware sub team, groupware research, data analysis, and literature review on groupware. Angela is also responsible for compiling midterm report and abstracts, posters, and presentations for IPRO day. She was chosen for her experience in relevant analytical software and strong working ethics.
Kibilko, Margaret	Reviewing current approach to IPRO games and other team functioning models, in order to recommend revisions and improvements to the IPRO Games intervention. She is also the team leader, writes the agenda for each meeting, and keeps team meetings on track. She was chosen for her leadership skills and experience in relevant analytical software.
Kolb, Hannah	Data analysis, seasonality analysis, regressional analysis, timesheet collector, midterm presentation, Final Presentation, literature review on forecasting. She was chosen for her strong background in math.
Ptak, Treyson	Responsible for the research and compilation of data on ethical awareness and education, will also be responsible for mid-term and final group presentations. He was chosen for his skills in research and problem solving.
Shi, Heling	Conduct the inter-rater reliability subteam, data analysis on past to present IPRO program statistics to measure inter-rater reliability, literature review on methods to improve the evaluation of inter-rate reliability, identify and create a

	suitable intervention program for such purpose. Also responsible for compiling the final report/grant proposal. She was chosen for her enthusiasm for work and her strong background in math and engineering.
Wood, Carolyn	Conducting the learning objectives subteam, preliminary data analysis, grammar checking IPRO deliverables, team project plan, literature review on how to teach students innovation and design, contacting and recruiting appropriate facilitators/speakers for the new intervention, peer-reviewed paper for FIE or ASEE regarding improvement of learning objectives. She was chosen for her experience in IPRO301 and having a background in statistics, as well as strong English skills.

8.0 Designation of Roles

- Minute Taker — Heling Shi
- Agenda Maker — Margaret Kibilko
- Time Keeper — Margaret Kibilko
- Timesheet Collector — Hannah Kolb
- Master Scheduler — Carolyn Wood
- iGroups Organizer — Heling Shi
- Team Leader — Margaret Kibilko
- Resume Organizer — Carolyn Wood