IPRO 301: Undergraduate Research on Interprofessional Education

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IPRO Day Presentation Fall 2007:
November 30, 2007
Why Interprofessional Education?

• Working in a team is now a required skill
  – Increase effectiveness of graduates
  – Improve students chances of getting jobs after college

• Teams consist of people from different backgrounds
IPRO Alumni Survey Results: Interdisciplinary project based learning is valued by my employer
Objective of 301

• Improve the quality of the IPRO learning Experience
  – How well are we doing it?
  – Did we improve it?
Research Projects in Fall Semester

• Defining & measuring new Learning objectives
• Improving groupware
• Improving Inter-rater Reliability
• Measuring Reflective thinking
• Increasing Ethical Awareness
Working as a Team

• Weekly Meetings
  – *Conducting Research Literature Reviews* by Arlene Fink

• Weekly Research Seminar
  – Feedback from other students on methodology

• IPRO Deliverables
Base Learning Objectives

• Project Management
• Teamwork Effectiveness
• Ethical Awareness
• Communication Comprehension
• Business Planning
ABET Accrediting Standards

Criterion 3. Program Outcomes
Engineering programs must demonstrate that their students attain the following outcomes:
(a) an ability to apply knowledge of mathematics, science, and engineering
(b) an ability to design and conduct experiments, as well as to analyze and interpret data
(c) **an ability to design a system**, component, or **process** to meet desired needs within realistic constraints such as economic, environmental, social, political, ethical, health and safety, manufacturability, and sustainability
(d) an ability to function on **multidisciplinary teams**
(e) an ability to identify, formulate, and solve engineering problems
(f) an understanding of **professional and ethical responsibility**
(g) **an ability to communicate effectively**
(h) the broad education necessary to understand the **impact of engineering solutions** in a global, economic, environmental, and **societal context**
(i) a recognition of the need for, and an ability to engage in life-long learning
(j) a knowledge of contemporary issues
(k) an ability to use the techniques, skills, and modern engineering tools necessary for engineering practice.
New Learning Objectives

• Innovation
• Multicultural awareness
• Design or Process Improvement
Defining a Learning Objective

- Identifying leading texts in the field for a body of knowledge
- Sub-domains, measurable skills or behaviors
- Learning objective test questions
- Interventions
Methodology

• Literature review on “how college students learn”

• Contact professors and collaborators for leading texts

• Construct sub-domains, measurable skills/behaviors, and LO questions from body of knowledge

• Have identified experts approve final form
Results

• Rough copies of all new LOs implemented
• Many sources reviewed for potential as body of knowledge; candidates for innovation and design
• Attended Frontiers in Education (FIE), contacted new potential collaborators
Groupware: The Problem

• What is groupware?
• Does groupware usage affect learning outcomes in the IPRO program?
  – Collect already-existing knowledge in this field
  – Collect information about our own program
# iGroups

## iGROUPS Home

**Welcome, Michael**

**Your iGROUPS:**

- Fall 2007
  - iGROUP 301
    - Files
    - Email
    - Calendar
    - Todo List
    - Contact List
    - Group Pictures
    - Your Timesheet
    - Manage Group
    - Time Reporting

- Spring 2007
  - Your Other Groups

**Update Profile**

**Visit iKNOW**

**IPRO Peer Review**

**iGROUPS User Manual**

**Need help?**

**Layout**

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**November 30, 2007**

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## iGROUPS 301

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Your group currently does not have any group pictures. [Click here to add a picture](#).

### Announcements:

- **Welcome to iGROUP 301!**
  - Get ready for FIE in Milwaukee in October!

- **Classroom changed to E1 241**
  - Time changed to 5:30-6:45pm.
  - [Click here to add an announcement](#).

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### Last 5 Emails:

- presentation update
- book ordering
- teamwork talk
- Project Task
- Table of Contents and CD

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### Last 5 Files:

- Wood 11/24
- iPRO Day Presentation - v3
- Zerone 11/12 to 11/18
- iPRO Day Presentation - v2
- iPRO Day Presentation
Methodology

• Literature review
• Collection and compilation of iGroups usage data and IPRO outcomes
• Student survey
Results & Future Work

• A literature review was completed, finding 7 interesting articles
• Compiled iGroups usage with IPRO outcomes
• Survey created
• Analyze compiled data and survey in the future
Inter-rater Reliability

- Inter-rater Reliability is the degree to which two or more raters agree.
- Where does it come into play?
  - IPRO Day
  - Proposal Reviews
  - Science Fair Competitions
Methodology

• Literature review
• Look at previous IPRO Day scores
• Calculate Reliability
  – Kappa Coefficient
  – $R_{wg}$
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Results and Future Work

• Calculated coefficients for Spring 2006 and Spring 2007 data
  – About a 4% decrease
• Perform statistical transformations to improve reliability
• Create intervention for IPRO Day judges
Reflective thinking is a way of thinking about ill-structured problems that acknowledges that there is not a single right answer, that decisions must be made based on judgments of available evidence, and that the best solution today might not be the best solution tomorrow.
Problem & Objectives

• Problem: College students do not typically think Reflectively

• Stretch objective: Stimulate development of Reflective Thinking

• Current objective: Develop feasible, valid method of measuring Reflective Thinking
Methodology

Measure through Individual Reports/Reflections

Responses scored into 3 levels of Reflective Thinking (condensed from King & Kitchener’s 7-stage reflective judgment model):

- Pre-reflective thinking
- Quasi Reflective thinking
- Reflective thinking
Previous Results

Average Reflective Thinking Score

Frequency

Mean = 1.63
Std. Dev. = 0.527
N = 182
Fall 2007 Results So Far

Mean = 2.09
Std. Dev. = 0.668
N = 78

Reflective Thinking Score

Frequency
Ethical Awareness

• Problem: Students are unsatisfied with ethical education.
• Objective: Increase the ethical awareness of IPRO students.
Alumni Survey

How effective was the Ethical Education?
Methodology

- Instituted new intervention.
- Support:
  - Seven Layers of Integrity
  - Workshop with June Ferrill, Ph.D. of Rice University
- Research methods of teaching ethics.
- Research methods for generating and grading codes of ethics.
Results

• Results:
  – The student generated codes indicate a strong understanding of ethical situations.
  – Average score: 78%
Future Work

• Fine tune support programs.
• Design and implement interventions for continuing IPROs.
• Collect data from outgoing students.
Conclusion

• Making a difference in the IPRO program
• Publishing peer-reviewed papers
• Helping 400 students get more out of the IPRO Program every semester
Acknowledgments

• Advisors: Professor Daniel Ferguson, Professor Margaret Huyck
• Tom Jacobius, Director of IPRO Department
• IPRO Staff
• Psych Service Center
Questions?