## IPRO 301: Undergraduate Research on Interprofessional Education

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> IPRO Day Presentation Fall 2007: November 30, 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





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# 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 November 30, 2007

OF TECHNOLOGY

#### 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



#### IPRO INTERPROFESSIONAL PROJECTS PROGRAM

# iGroups

IPRO It takes a team	IPRO 301														
PROJECTS PROGRAM	Tue 11/27	Wed 11/28	Thu 11/29	Fri 11/30	Sat 12/01	Sun 12/02	Mon 12/03								
<b>IGROUPS</b> Welcome, Michael				IPRO Day											
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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**

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**



#### Fall 2007 Results So Far





## 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?





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# 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?



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