IPRO 301
Researching, Designing, Testing and Evaluating IPRO Program Enhancements

Illinois Institute of Technology
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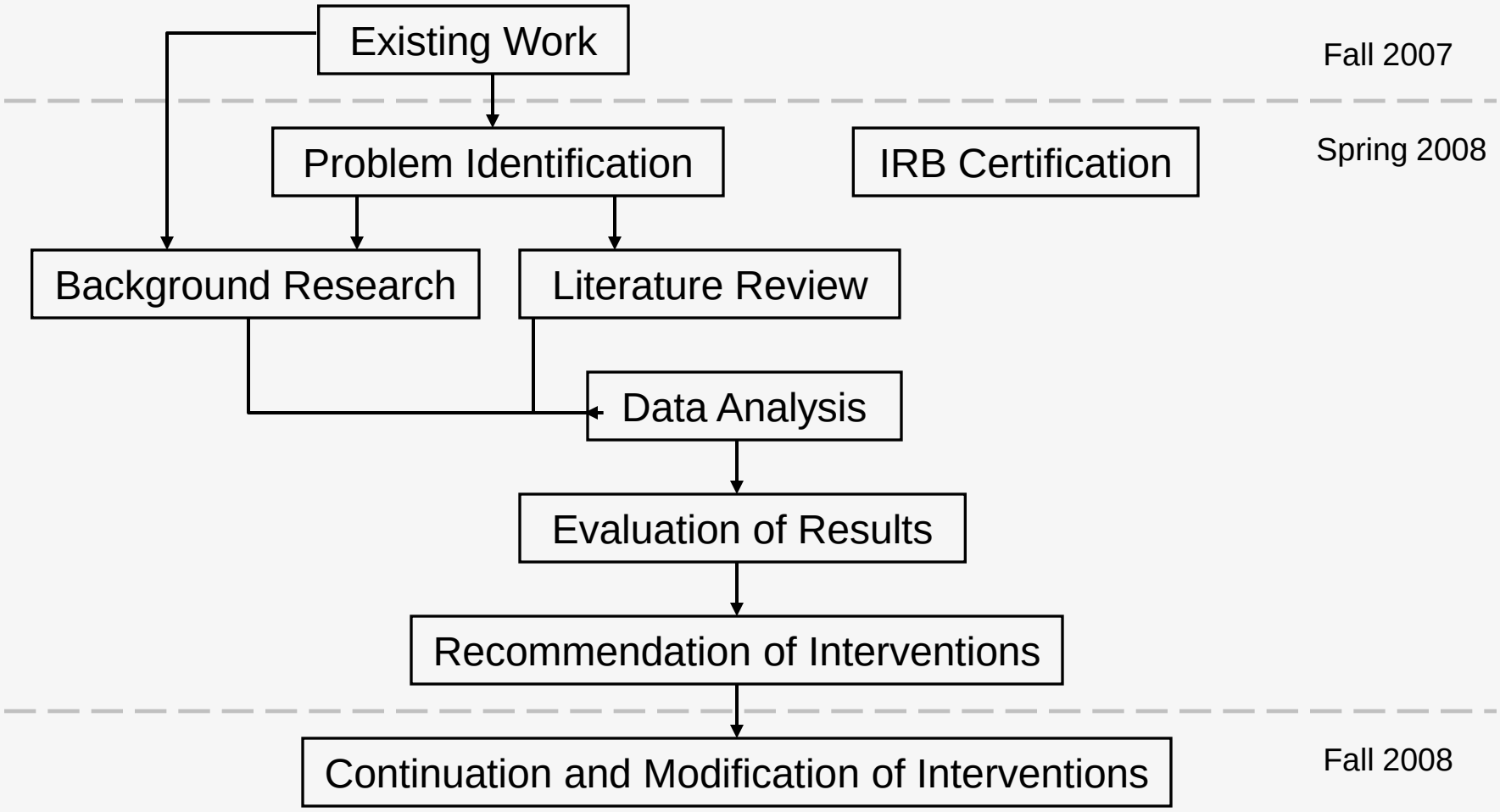
Team Objective

To conduct a professional, multidisciplinary research program to improve the calibre of IIT student learning.

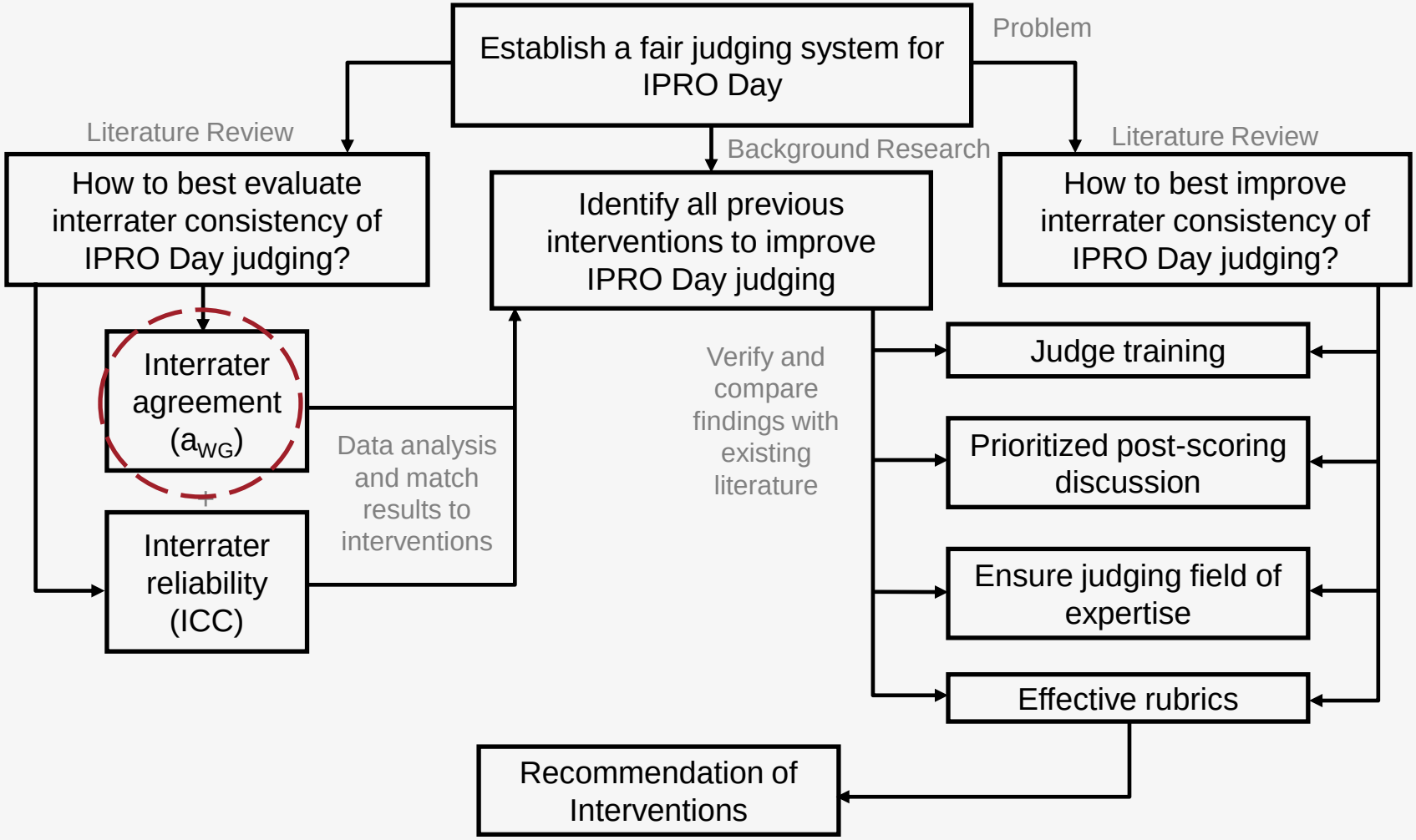
Members and Projects

Research Project	Team Member	Major
Interrater Agreement	Heling Shi	Mechanical Engineering
Groupware	Angela Gandhi	Psychology
Teamwork	Margaret Kibilko	Psychology
Reflective Thinking	Kristin Bryant	Psychology
Forecasting	Hannah Kolb	Applied Mathematics
Learning Objectives	Carolyn Wood	Physics

Research Methodology



Improving Interrater Agreement



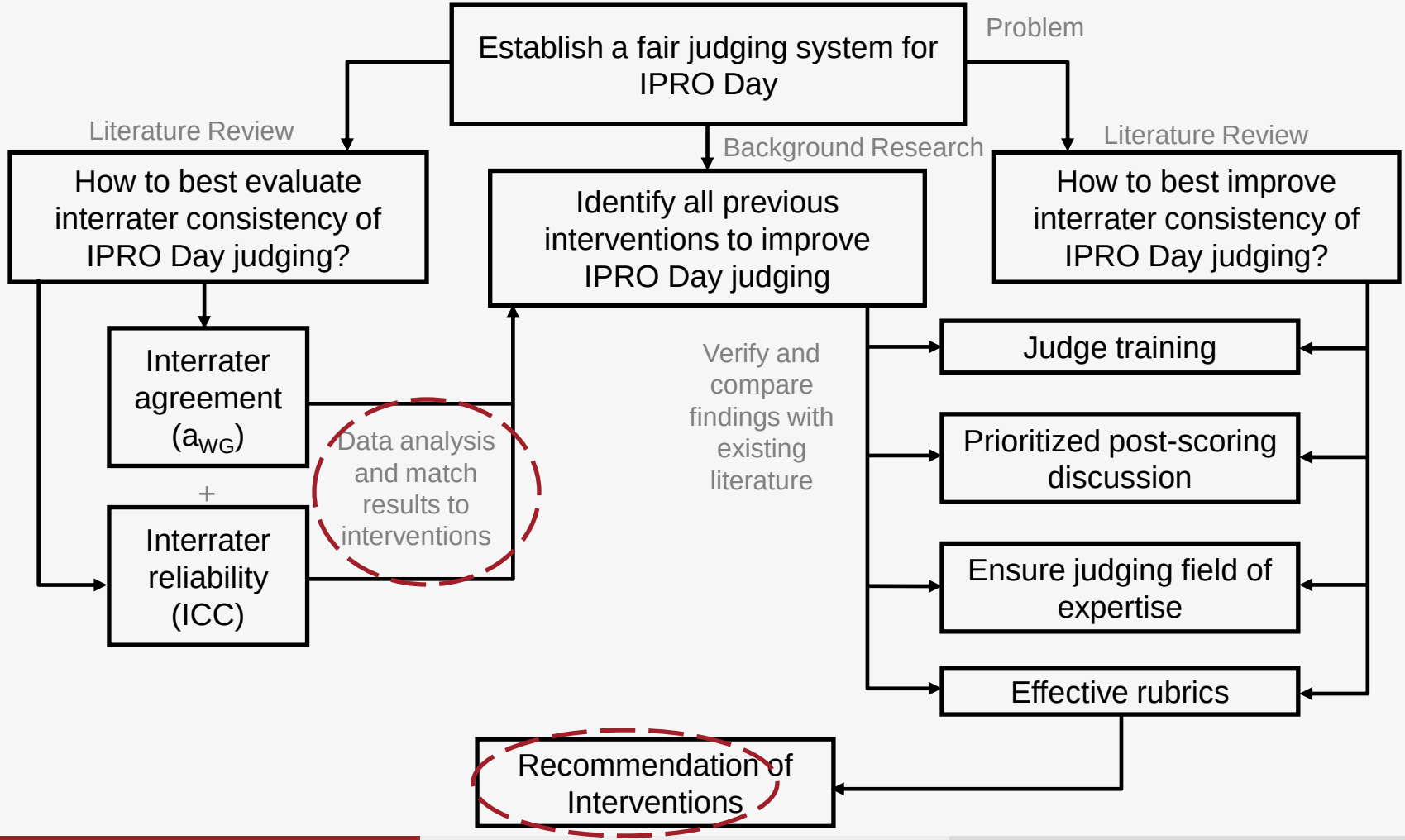
What is Interrater Agreement?

Extent in consistency of scores/ratings

Interrater Agreement (IRA)
*Measures **absolute consensus**. Estimates if the scores by judges are interchangeable in terms of their absolute value.*

Interrater Reliability (IRR)
*Measures **relative consistency**. Estimates if the scores given by judges are relatively consistent with other judges.*

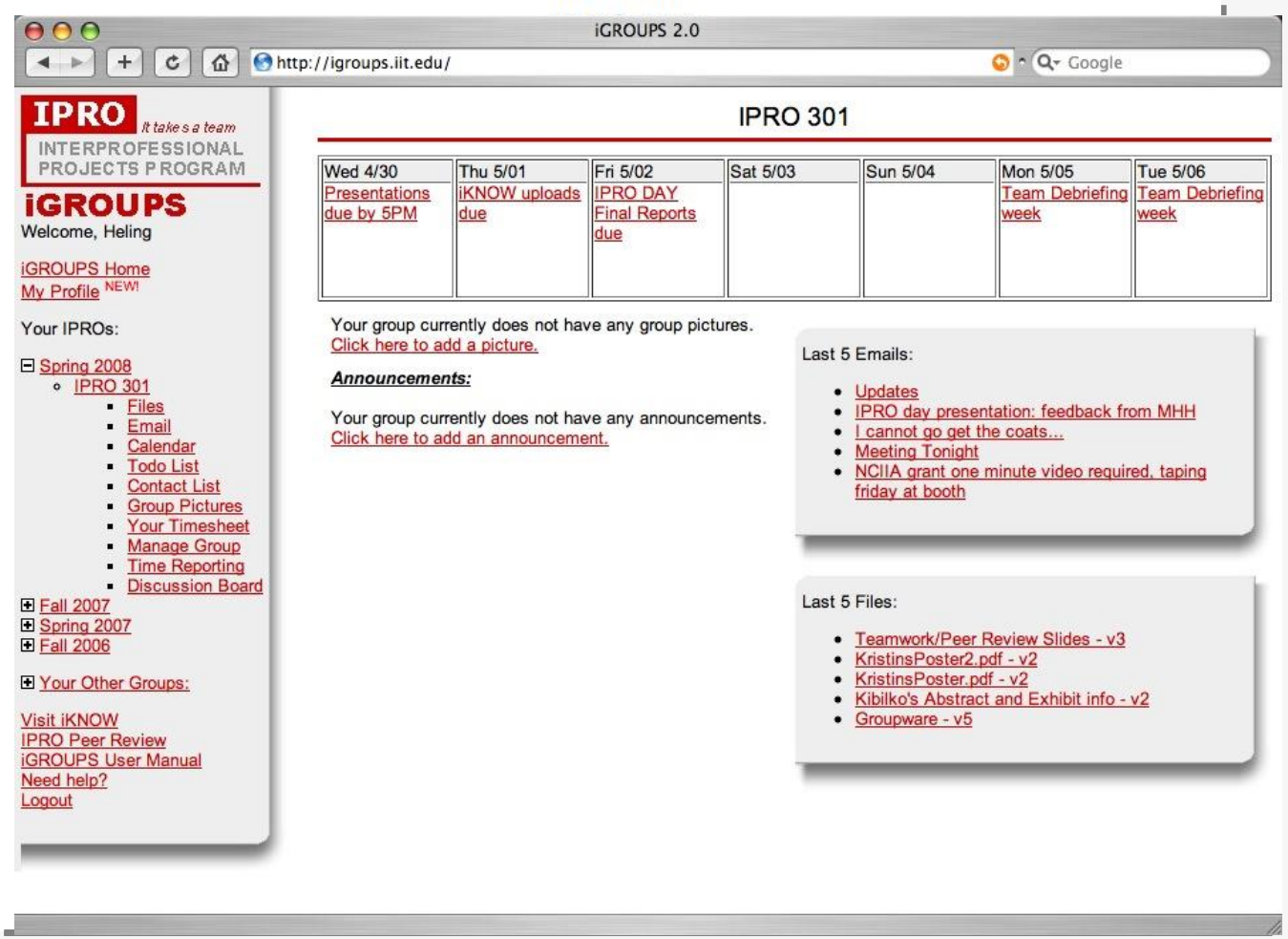
Results and Future Work



Groupware on Team Communication

- Groupware: Computer programs that help teams communicate virtually
- Objective: Does groupware usage enhance learning outcomes in the IPRO program?

What is iGroups?



Results and Future Work

Fall 2006 Team Data Analysis

	Percent of Mean Files		Percent of Mean Emails		Sum of Mean	
Outcome Measures	Correlations	Significance	Correlations	Significance	Correlations	Significance
Meeting Minutes Score	.35	.04	.31	.06	.35	.04
Midterm Report Score	.29	.09	.35	.04	.33	.05
IPRO Day Presentation Score	.38	.02	.21	.23	.32	.06
IPRO Day Total Score	.36	.03	.23	.18	.32	.06
Teamwork & Trust Survey	.03	.89	.04	.81	.30	.85

Spring 2007 Team Data Analysis

	Percent of Mean Files		Percent of Mean Emails		Sum of Mean	
Outcome Measures	Correlations	Significance	Correlations	Significance	Correlations	Significance
Meeting Minutes Score	.25	.13	.41	.01	.35	.03
Midterm Report Score	.02	.90	.06	.72	.04	.81
IPRO Day Presentation Score	.16	.32	.22	.16	.21	.19
IPRO Day Total Score	.09	.60	.32	.05	.21	.20
Teamwork & Trust Survey	-.27	.10	-.04	.84	-.19	.25

Assessing and Enhancing Teamwork

- Research questions:
  - Are IPRO Games an effective way of stimulating teamwork?
  - Are peer reviews an effective way of measuring teamwork and team-functioning?

Results and Next Steps

- Peer reviews
  - Behaviorally anchored
  - Based on observable instances
- IPRO games
  - Data do not show statistical significance
- Next steps
  - Revision of current peer review instrument
  - Increase use of peer reviews within IPRO's

Reflective Thinking on Service-Learning

- Reflective thinking is the ability to make good decisions about ill-structured problems
- Service-learning
  - Experiential education
  - Address community needs
- What is the connection?

Building on Past Work

- Developed a system to assess reflective thinking through written work
- Data collected on students' reflective thinking levels over the past three semesters
- Developed varied ways to increase reflective thinking skills

Results and Next Steps

- Most IPRO students pre-reflective or quasi-reflective
- (Need results here)
- Recommendation for future work

Forecasting

- Forecasting enrollment allows for better IPRO management
- Seasonalized linear regression model
- Created and implemented forecasting program

Results

	S08			F08			S09			S09			F09			S10		
UG1	0	**0**	0	0	**0**	0	0	**0**	0	0	**0**	0	0	**0**	0	0	**0**	0
UG2	1	**1**	2	9	**15**	20	10	**16**	22	1	**1**	2	9	**15**	21	10	**17**	23
UG3	5	**6**	7	76	**87**	98	85	**98**	111	5	**6**	7	77	**88**	100	86	**99**	100
UG4	25	**30**	34	166	**196**	226	202	**238**	275	27	**32**	36	175	**206**	238	212	**251**	290
UG5	10	**11**	12	67	**72**	78	92	**100**	107	11	**12**	13	73	**79**	84	100	**109**	117
G1	0	**0**	0	0	**0**	0	0	**0**	0	0	**0**	0	0	**0**	0	0	**0**	0
G2	0	**0**	0	0	**3**	7	0	**1**	4	0	**0**	0	0	**3**	8	0	**1**	4
OTHER	0	**0**	0	12	**16**	21	7	**10**	13	0	**0**	0	13	**18**	23	8	**11**	14
TOTAL	44	**49**	53	361	**398**	335	425	**467**	511	46	**51**	56	378	**418**	457	442	**489**	537
ARCH	5	**6**	7	56	**65**	75	56	**66**	75	6	**7**	8	60	**71**	82	61	**71**	82
ENG	24	**26**	28	171	**187**	203	224	**245**	266	25	**27**	29	177	**194**	211	232	**254**	276
BUS/MAN	1	**1**	2	23	**37**	51	22	**36**	50	1	**1**	2	26	**41**	56	25	**40**	54
CSL/PYSH	8	**10**	13	96	**127**	158	102	**136**	169	8	**11**	14	99	**132**	166	106	**141**	177
TOTAL	44	**49**	53	366	**405**	443	434	**480**	526	46	**51**	56	383	**424**	466	454	**503**	553

Armour College of Engineering

	F08	
171	**186**	201

Redefining Learning Objectives

- Develop new objectives of design and innovation
- Re-write learning objective test
  - Length
  - Concept material

Results

- New test with 35 questions
  - Communication (10)
  - Teamwork (10)
  - Project management (15)

Implications and Future Work

- Increased faculty and student acceptance
- Critics become advocates!
- Student study guide

Acknowledgements