

TEAM FORMATION PANEL – Wednesday, June 6<sup>th</sup>

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Panelists: Matt Swenson, University of Idaho; Richard Parker, University of Colorado-Boulder; Julie Ford, New Mexico Institute of Mining and Technology; Madeline Galvin, RIT

**What are common practices for capstone team formation?**

- Probe **student preferences** (project descriptions & sponsor fair) => promotes student ownership
- Inventory student interest about growing skills in particular areas
- **Validate team assignments** (w/input from instructor observations from previous classes)
- **Forecast team composition** for anticipated skills as a starting point for team assignments (**publish skill sets needed for specific projects**)
- **Pre-announce project options** w/survey questions => allows formation before class start-up
- **Accept input from project proposers** (based on sponsor fair or student survey data)
- Consider homogenous versus heterogeneous teams based on GPA (can produce good results)
- High GPA is not necessarily correlated with good team leadership in many cases (higher GPA is probably a good proxy for better skills in specific technical areas)
- Recognize needs of different types of projects for different team composition (i.e. industry projects, competition projects, or faculty projects)

**What are good practices in identifying/promoting team leadership?**

- Include survey items about student interest in growing project leadership skills
- Team start-up should include discussion of team roles/responsibilities
- Revisit team organization as needed throughout the project

**Under what conditions should teams be reorganized?**

- Don't be afraid to intervene if major team performance issues emerge
- Involve students in analyzing team performance and corrective actions
- Seek role adjustment first before considering team re-assignments
- Don't provide an easy-out by announcing re-assignment as an opportunity up front
- If project needs evolve that de-emphasize disciplinary contributions, consider reassignment

**What tools are used for team formation?**

- CATME Team Maker is used by some programs for single-discipline assignments
  - some discrepancies between preference part and diversity considerations
  - algorithm is not clear
- RIT model (done this past year by Industrial Engineering students)
  - includes student and sponsor surveys
  - includes query on skills

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- includes query on project preferences
- 'score fits' are optimized in Python
- Process of manual sorting helps to promote instructor knowledge of teams
- **There are some similarities and differences between what is done in industry...**
  - **team members are chosen based on skills/experience**
  - **team grow over time and integrate different levels of expertise**
  - **teams are reorganized over the course of a project, based on other external needs**

### **What is our best-thinking about self-selected teams?**

- If this team assignment system is working in your program, don't change it without good reason
- Under this system, what should be done to manage those who are not selected?
- Self-selection is not an authentic practice in industry other than some entrepreneurial ventures
- There is value in having students working with others that they haven't worked with before
- **Basic principle is that students should have cradle to grave ownership of their project**

### **What recommendations do we have for new programs?**

- Consider elements of your program that reflect authentic projects in industry => mirror these
- Allow space for students to propose projects, but within specific guidelines & advance dialog (it is good to insist that students find someone to serve in the client role)
- Synergize class requirements w/rules & deadlines for competition teams => systems engineering

### **What are best practices for forming engineering & business teams?**

- Engage your technology transfer office
- Promote discussion between engineering and business faculty involved in capstone courses
- Have engineers take some business courses as technical electives (esp. entrepreneurship)
- Give opportunities for capstone teams to test waters through 'pitch competition' participation
- Examine LeHigh's integrated business/engineering program as a case study (w/some common courses across colleges leading to minors for those in the opposite discipline)
- Explore Innovation Fellows program by KEEN => involves a proposal

### **Should teams be formed to accentuate opportunities for conflict resolution/development?**

- There is enough complexity in the capstone environment to surface these issues w/o need for intentional disruption
- Team formation doesn't minimize instructor responsibility for mentoring team success

### **How should gender diversity be incorporated in capstone teamwork?**

- We need to work w/current student population, recognizing that there is a current shortage
- Infuse training opportunities with people from Human Resources/Career Services
- Debrief diversity/team issues in just-in-time manner within instructor/team meetings

### **Closing Thoughts by Panelists**

- Remember that students are people whose success is a primary capstone outcome
- The team formation process doesn't end on the day you form your teams  
=> **you need to put in time throughout the course to mentor team success**
- Set a problem-solving mindset in your instructor/team interactions
- Take actions that heighten student engagement, not just promote product quality  
=> students want to be on a project that aligns with their interests  
=> students want to be on a project that will grow their skills  
=> students want to work with others in authentic contexts