Engineering Competitions as Communication Learning Opportunities

Cal Poly Pomona
Faculty Center Presentation
Bill Kitch, Civil Engineering

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A Collegial Discussion

- Present 3 case histories of student competitions
  - Two unsuccessful
  - One successful
- Describe the differences
- Discuss how we can make better use of these opportunities

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Case 1: Geo-Challenge

- Competition Background
  - Discipline specific design competition
  - Presented at a national professional conference
  - Evaluation based on
    - Quality of 3 page technical report, used to select national finalists
    - Efficiency an performance of actual design as evaluated at national competition

- CPP historical performance
  - Place 3rd in 2009, first time entered
Case 1: Geo-Challenge

- Team
  - Team relatively well structured and organized team of 6 to 8 students
  - Approximately 10-12 weeks to perform testing, complete design and write paper
  - Level of effort ~ 500 student hours

- 2010 Results
  - Tech paper scored in lower ½ of submissions
  - Not selected a finalist
  - Actual design would have beat national winner if team had made nationals
Case 2: Geo-Prediction

- Competition Background
  - Discipline specific analytical computation
  - Presented at a national professional conference
  - Evaluation based
    - Accuracy of analysis
    - Quality of 3 page written report
  - First year of competition
Case 2: Geo-Prediction

- **Team**
  - Two students
  - Completed entire analysis and paper in ~3 weeks
  - Level of effort ~100 student hours

- **Results**
  - Placed 2\textsuperscript{nd} at nationals
  - Paper judged as best in competition
Case 3: Concrete Canoe

- **Background**
  - Oldest national ASCE student competition
    - Regional qualifications followed by nationals
  - Evaluation equally divided between
    - Quality of final product
    - Technical paper ~ 20 pages
    - Technical presentation ~ 20 min
    - Races
  - CPP has made nationals about every other year
    - 8th place nationally highest finish

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Case 3: Concrete Canoe

● Team
  - Large team 10-20 students
  - Formal organizational structure
  - Requires $5,000 - $10,000 in fundraising
  - Level of effort > 5,000 student hours

● Regional results 3rd Place
  - Final product: 3rd
  - Races 2nd
  - Paper 5th
  - Presentation 7th
  - Didn’t qualify for nationals
Attributes of Unsuccessful teams

- Ratio of analytical to writing time ~9:1
- Little or no active coaching during writing phase
- Reports (or presentation) completed just before deadline
- Large teams with 4 or more authors
Attributes of Successful team

- Ratio of analytical to writing time ~1:4
- Active coaching during writing process
  - Reviewed 5+ drafts
- Writing started only 2 weeks before deadline but stayed on schedule
- Two person team with one student doing vast majority of writing
Performance Observations

- No excellent writers on any team
- No teams familiar with style appropriate for the reports
- Unsuccessful teams
  - Didn’t follow guidance
  - Missed audience
  - Had disjointed organization & flow
- Grammar not a significant issue
What did we learn

- Communication important to national engineering groups—can’t win without it
- Good reports require multiple drafts and coaching from a skilled writer
- Biggest issues
  - Analyzing audience
  - Organization & structure
  - Lack of familiarity with form
  - Team writing
- Grammar is NOT the biggest issue
Help!

- How to efficiently coach and review drafts
- Guidance for team writing
- Time