Capstone 2014 DESIGN Conference
JUNE 2 - 4, 2014 ▸ COLUMBUS, OHIO

The following slides summarize the 2014 Capstone Design Conference Panel Sessions.

1A: What I Wish I Knew on the Job my First Year

1. Be flexible; what you think you want may not be all you need
2. Story Telling – be able to fully discuss the project (not just the results); this includes your professional life; “put your boss in a position to help you, not judge you”
3. Know that you are going to fail

1B: Global Capstone Design

1. Define the goals (why are you interested in this at all – cultural? Project goals?)
2. Determine or define the project model that you want to use (joint project/stay at home model or travel overseas model)
3. Provides tremendous benefits to our students – really consider this type of experience

1C: Project Definition

1. Good problem definition is essential (make sure you solve the correct problem)
2. The advisor/instructor are going to need to facilitate between the stakeholders and the team to make sure the definition of the problem is of appropriate scope. (Try to avoid scope creep)
3. Time allocated to problem definition varied widely among institutions.

1D: Uncommon Deliverables in Capstone Courses

1. Elevator pitches, mini reports, prototyping
2. Deliverables vary
   - Scalability (is all the critical assessment information scalable?)
   - Sustainability (is the structure really sustainable if the administrators/coordinators change?)
   - Suitability (Are the deliverables tied to the learning objectives? Are you adding value by adding these deliverables?)

2A: Product vs. Process

(end result or the path taken)

1. Most of the room decided that this was a false dicotomy
2. Group wanted a blend of this across disciplines with students being aware that this difference exists
3. Suggestion of future conference discussions

-balance

-best practices

- Talking with administration

2B: Intellectual Property

1. It is very important and we care a great deal.

2. It is intellectual property that we cannot share at this time.

3. Real content:
   - There are good models; it is important to figure out how you get to these models
   - It is important to get coordination and have people work together to figure this out. (Master Agreements)
   - Check out Poster #6!

2C: Best Practices in MD Capstone Design

1. Use of project prototypes for large scale environmental and civil service projects.
2. Value of starting the project in parallel with learning the process. (Realize the impact that delays have on the project)
3. Separation of mentors from evaluators. Use double grading (mentors contribute to the process but aren't solely responsible).

2D: Best Practices in Industry Sponsorship

1. Soliciting industry sponsored projects – leverage your alumni (they understand and may want to mentor/sponsor), talk to development office (carefully), talk to faculty members/dean/advisory board members. When contacting a company, don't go to the CEO – contact someone at the project engineer level and let them work their way up.
2. Try to maximize happiness. Let students have a say in the teams they work on (polling them for information for providing direction). Students must understand they may not get their choice, but give some effort (to help students engage)
3. Clarify expectations with course deliverables. Make sure the sponsor understands and agrees early on (availability, communication). Provide guidance for the mentoring role (industry liaison)
4. Have a kick-off day!

3A: Technical Design Reviews

1. Definition of TDRs. (Feedback/formative)
2. Faculty/students/industry/machinists should be involved
3. Time constraints are an issue (resource intensive) – how can we do this? How to use students? Parallel sessions?
4. Preparing students for TDR (be on one vs. how to give a TDR) – what documentation is required (logbooks, calculations)? Be clear as to the expectations of the students. Super-groups (observing TDR vs participating). Six Hats (adopting different roles during the critique of the TDR)

3B: Student Perspectives on MD Capstone Teams

1. Teams will be larger
    1. Have at least 2 members of a discipline
    2. Important to have diverse tech expectations
    3. Shared project expectations is desired (no changes between disciplines)

3C: IT Nuggets in Capstone

1. E-portfolios can help with communication skills but can also be helped to spread design throughout the curriculum.
2. Software tools can be good for feedback to students and can help faculty maintain their sanity!
3. Versatile data acquisition and analysis tools can bring the theoretical concept together in an interesting way.

3D: Supporting Successful Teams

1. Students need explicit team skill development before and during capstone projects.
2. Students need both formative feedback (to improve) and summative feedback so they can be help accountable.
3. No matter where you get your information, instructors must use judgment on how to use this information.

4A: Communication in Capstone Design

1. Students must understand why they must develop this skills.If they aren't willing to listen – invite a guest speaker.
2. Many students have individual skills but writing as a team is new. Students must get specific assignments (for practice) and peer editing (proof-reading) can be helpful in managing the time requirements)
3. Students must write coherently, concisely and clearly. Clearly specify what we want and provide activity.

4B: Assessment Challenges in Capstone

1. Diverse practices on using expos for student grading. Best to weight the pieces and grade accordingly. Several types of reviewers (internal and external). Set reasonable and discrete requirements/thresholds that they can work with.
2. Team member assessment. Timing can vary. Sharing with team members also varies. Self evaluation should be shared. Peer evaluations are more variable.
3. Rubrics for courses – rubric details should be used in moderation (i.e. not too many details), subjective components can be used (don't be afraid to use them)

4B: Assessment Challenges in Capstone

4C: Infrastructure for Prototyping

1. How do you teach prototyping/modeling/simulation? Is it intentional or is it trial-and-error? Architecture does it well.
2. Safety is a concern – need a culture of safety (but how you get this developed is a challenge and varies among schools)
3. Hands-on-learning is very important.

4D: Pathways to Innovation Program

1. Location of capstone in the innovation process – Research, invention, innovation, start-up, scalable enterprise. Innovation and invention is where typical design lies.
2. Capstone programs who are interested in more entrepreneurship can leverage this on their campuses with other programs. Consider options, not requirements.
3. If you are interested, be aware that proposals to the program is in October 2014. This takes some planning (not an individual effort, groups of 5 are not unusual).

5A: Teaching Capstone Design

1. Developing rapport with student teams over time
2. Helping students to develop professional/life skills
3. Helping them understand how to target their writing
4. Finding ways to help them develop hands-on skills.

5B: Nifty Ideas and Surprising Flops

10 nifty ideas & surprising flops

Details to come (they are awesome, you want to read about them)

It is worth trying things out – celebrate successes and admit problems!

5C: Communicating Progress in Capstone Classes

1. Progress reports are iterative with lots of feedback.
2. Students have limited backgrounds with how to prepare these, especially graphical backgrounds.
3. The amount of feedback creates scaling problems.

5D: Case Studies in Use of Standards with Capstone Projects: A MD approach

1. Develop training materials around standards, regulations and other industry models.
2. Develop a resource enabling student to be able to find information.