Panel 1B
Written & Oral Communication in Capstone

Facilitator: Bridget Smyser – Northeastern University

Panelists:
1. Marie Paretti – Virginia Tech
2. John Parmigiani – Oregon State University
3. Hugh McManus – Northeastern University
4. Alexis Gillmore – University of Tennessee, Knoxville

Description: Capstone is an excellent opportunity to assess students' ability to communicate their designs and satisfy related ABET criteria. The panelists will share their strategies for teaching and assessing these important skills.

Notes:

How does your program teach these skills?

Hugh: 2 term sequence, iterative writing assignments building to final report. Structured mentoring and coaching/feedback. Building oral reports as well, lots of peer feedback. Thinking about bringing peer feedback to writing as well.

Q: How are the artifacts iteratively assessed?
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John: 2 term sequence. Home of the writing intensive course for program. 'Corrupted' by being the writing intensive course - lots of individual assignments. Research statement, design proposal, graded and resubmitted in response to feedback. Oral presentation in first term graded by professor. Writing evaluated by technical writing.

Q: How is the grading work load managed? Is both technical content AND quality of writing being evaluated?

→ Split between technical advisor and writing evaluator.

→ Separating the writing and technical papers

→ focus on depending on the TA to provide high-level overview.

→ in some cases focusing on clarity of writing

⇒ (additional notes below)

Marie: Have been teaching workplace communication. Central to communication assignments is that they are functional. Not something that is just to the professor. Assignments advance the project. Every assignments has a function for the team and the instructor. Part of a dynamic conversation about the projects. Short assignments vs. huge reports (the 'whack' factor). Don't need the long reports. Visually appealing presentation. Instructor actually responds to the teams based on the assignments.

Q: What are some examples of short assignments that are high impact for students (ex. Quad Charts, Memos, etc.)?
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How is it taught?

John: Lots of different ways. Course instructor, professional tech writers. Course instructor in the classroom currently . Unintended consequences - writing co-instructor had either too much to do or too little to do.

Marie: Was the writing instructor in the capstone course but was also an engineer. Co-instructor relationships mean you need someone who is invested in the technical aspect as well. "How do you feel about science and engineering?" was a key question to ask while hiring. Graders in bigger sections (UG and grad students). If the info is only for a grade it is miserable to write and grade.

→ Usability & utility of the information is prioritized.

Hugh: Mix of things. Right now: We don't do a ton of classroom instruction because they have all had 2 writing classes. How to construct the papers, following templates, the feedback and grading is from a structured rubric. Sessions where groups meet with mentors one on one. Still working on bringing in more peer feedback.

→ Templates + feedback + rubric = clear expectations

Biggest challenges

Marie: Get beyond right and wrong and into the idea that you are trying to communicate something. There isn't a 'right way' to write a particular bit of communication. Templates are important. Need to design the communication like you design the project. What are the rules for this company/class/client? Grammarly website very helpful. The free version catches a lot of grammar errors.

→ Communication as a functional act in design; understanding that function

→ Understanding of audience and purpose; "designing communication"

Hugh: Practical concern is time. The thing that works best is individual feedback and personal mentorship which takes time. Lots of diversity in communication skills. Asked students who did well what they're secret was. Answer was prep school, which is discouraging.

**Q: How do you manage the diversity in communication skills? Are there efforts to address that diversity in earlier courses?
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John: Amount of writing and how to grade it. They had 4 different folks grading writing. Good people did their job well and writing improved. Got very big reports. Started to become a writing class with an engineering program attached. Turning things around quickly worked, but students weren't happy. Getting too much feedback in some cases. They had to recalibrate and shortened the reports to a conference paper length. If you ditch the staff - how do you get it done? Hire part time technical writers. Created a style guide, refer students to that to speed things up.

I use a comment code to grade. Instead of writing in margins, I number edits and place a letter to indicate what can improve:

"<u>**Individual Paper Feedback List:**</u>

Below is a translation of my comments on your work. Most comments only address the writing mechanics of the white paper and do not critique the content. You are required to address each of the numbered comments and re-submit the paper with revisions.

Each lettered comment relates to the feedback listed here:

A. Acronym or Lingo is undefined or would be useful to define for the reader.
B. Choice of word or phrase is odd.
C. Missing context. The reader might not follow along.
D. Divide a long paragraph or block of text. Avoid long blocks of text.
E. Use a figure or table in place of text. Be visual.
F. Formatting or spacing error.
G. Grammar error.
H. Update the text based on recent progress and new understanding.
I. Incomplete sentence or strange sentence structure.
J. Create a short intro/Conclusion for the section.
K. Create a section heading or subheading to break up the text.
L. Latin should be italicized. For example, *in vitro, in vivo, E. coli*.
M. Merge paragraphs
N. Needs statement should be improved. Avoid embedded solutions and have a defined scope with measurable outcomes.
O. Orphan word. An orphan is a word that stands on its own line after a paragraph, creating significant white space.
P. Punctuation error.
Q. Add quantitative content
R. Missing or improper references.
S. Spelling error.
T. Tone is informal or conversational.
U. Unclear, rambling or redundant text. Often a product of writing based on a stream of consciousness with no revision or editing.
V. Vague, be specific. What does it mean to "help", "optimize" or "improve"?
X. Devise an experiment

"
Students get points for making revisions and they have to address each one in order of the numbering.

Q: [Preamble] Struggling with balancing the need for timely grading with adequate documentation: (1) How do industry sponsors accept the smaller deliverable? (2) How are other elements of the students' thought process captured longitudinally?
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Audience questions:

Q: When you have multiple people grading, how do you equalize? What tricks do you use with faculty vs. grad students?

Hugh: Rubrics can make it worse. A younger faculty used the rubrics to savage the students. Have to put something in to equalize, and the course coordinator can do that. Feedback from peers can either be 'all fine' or brutal. Partial solution: Be really transparent, publish the rubric. For the presentations, need to be less transparent.

John: Every team is getting an A except 1. One faculty much harsher. Can't statistically correct because of small sample sizes. With tech writing staff can do the statistics to balance things out. Hard to get faculty colleagues to conform.

Marie: If you're going to do it, it's about norming. Use examples of previous reports to explain what A, B, and C means. Training people in 'this is what we mean'. An agreed upon collective idea of what is effective. What is strong in this context?

Q: Have a group of students that need to write one document. Either there is one student that writes everything, or students write a document that is clearly a bunch of different writers. How do you get everyone to contribute and still get decent communication?

John: Lots of individual assignments with lots of feedback. Group writing is for the students to figure out. In the past, had 3 group reports. Had a complicated algorithm/grading system. Rotated lead on each report. Each student had to lead one report.

Hugh: Opposite approach - almost no individual assignments. Have each paper have an editor from the team. Works ~60% of the time.

Marie: Rotating memos through the team members so everyone gets a chance. Leads on given tasks have to report the results of the different parts of the Gantt chart. Give them opportunities to revise/edit which helps with the group projects. Give them class time to work on writing tasks. Have to be careful in assuming that students can find times outside of class to meet. We need to give them time when they are all in class if possible. Google docs let you know who is contributing to the writing.

Q: Getting student buy-in is important. How do we get them to understand the importance of the writing/communication skills?

Marie: At work, up to 70% of time spent in communication. Providing student friendly handouts with quotes from recent alumni telling student how much time they spend doing this stuff. Professors sound like Charlie Brown's teacher. Alumni voices are much more valuable to the students.

Hugh: Students hate to write - they don't care if they're supposed to do things a certain way. Students buy into oral presentations and get excited about it. It's not a general lack of buy in - it is based on the mode.

John: This is fairly basic, not writing poetry in a field. They may never love writing, but they can do it well anyways.

Q: Students don't separate different means of communication.

Marie: Understanding audience and purpose. Need to frame assignments and understand the reason/function. Giving students example posters/resumes to look at it. Why are you giving this presentation? How does it play into design? Communication has specs, functions, requirements just like projects. Training students for peer reviews using role play - respond to manager. If you have 2 minutes, what do you get.

John: Audience is definitely key. May need to send someone slides, for example, so they need to be able to convey the message without a speaker. Really explain who the audience is.

Q: How do you balance grading writing AND technical aspects?

Hugh: These things get separated in terms of assignments. Advisors grade tech aspects, writing style graded separately.

John: Short written document about technical aspects that a technically knowledgeable person could understand vs. a purely technical document to check math, etc.

Marie: If I can't understand it or TLDR, then the tech dimensions aren't easy to untangle. If it isn't clear to read, it doesn't matter if it is technically correct because you can't get that far in the document.

Q: You're producing a product for a client. Do you work with the client to review reports and such?

John: Over 20 years, done a lot of things. Rubric graded by project mentor and faculty supervisors. Clients being involved was as bad as multiple faculty grading. Clients not always technical people, so just gave them a high grade. Even more variability than professors.

Hugh: In our system, everyone has a faculty advisor, but not all have a client. It's sort of impossible, but can be a powerful motivational factor. Does depend on the engagement level of the client, so can be variable.

Marie: Some people already do a lot of industry projects, such as Susannah Howe and Daria.

Daria Kotys-Schwartz: They don't grade, they give feedback from advisors and clients. In industry, don't get grades. Weekly meetings with clients. Can't replicate communication nuances in different companies. Won't take clients who won't meet weekly with groups. Do performance evaluations at the end that then translate into grade. Students own the communication.

→ transitional vs. culminating experience

→ weekly meetings; regular feedback; communication aligned with client work enwarment

→ setting clear expectations with client for engagement;

Julia (Daria's co-instructor): There are some required assignments, but most of it is what the client wants.

Q: Everything is so centralized - how to decentralize? Can students reach out to people themselves? If the student wants to do something for themselves - can they reach out to anyone vs. just the professor? (Student question)

Hugh: A lot of this isn't so much about grading, but about mentoring. There are resources. I can't teach a non-native speaker grammar, but I can point them to other resources.

Q: Been working on community engaged projects. Lots of different audiences - partners, community associations. How to teach them to talk to a variety of audiences?

Marie: Gather from alumni/past projects. Why are these different? What is different for the different audiences? Worth class time to look at exemplars. Group x had to communicate with a vendor - what style did they use? Why is this an email vs ppt presentation? Who needs what information. Examples are the best.

Hugh: Both terms all students present to all the other students with lots of peer feedback. Lets them see the diversity across projects/clients. Students need to see how different clients are addressed. Peers teach each other.

Q: Multidisciplinary program. Some departments want to assess everything with one big report, some don't. Advice on how to convince collaborators to get to industry based communication vs. super long reports?

John: I've been there. Every time someone came up with a good idea, "Let's put it in the report" so reports got very long. Pulling back from that was a big change - change in focus, change in staff. Students spent more time writing versus designing. Good idea to reach out to industry people to help influence change and get advice.

Marie: Treat yourself like a design team. What are the specs? What is the goal? What is important? Are you putting things together for ABET? Trying to please a customer? Productively debate like you would coach a team to do. Model what you want the students to do.

Q: Comment on exercises around reflection. How do you use it in your programs in context of communication?

Marie: Asking students what they want out of the class. What does it look like to go to industry, where are they now, and what do they want to learn? Reflect individually and with team. Is everyone on the team learning what they want to? Instructor needs to create a safe space for learning so that gaining new skills is facilitated. How do we support learning? Also reflection on team as a whole so they don't feel like they are selling someone out. What is not going well, and how can they overcome those? Student teams have roommate issues, etc. that don't exist in industry.

Hugh: Using reflection a lot of different ways. Introduced it recently after technical reviews - what is and what is not going well? What did you learn from the design reviews? Reflect at the end, but that's sort of too late for the students to benefit. Reflection is powerful. Ask how can YOU be a better teammate? Get startlingly frank responses.

Marie to Hugh: Is it a team reflection or individual reflections?

Hugh: Yes!

John: Depends on the instructor's time. They did have an individual reflective assignment at the end, but mostly useful to the instructor. For the students themselves, allocated who on the team should get what fraction of points. Also tried time card system.