Breakout 2 notes

1. **Should undergraduates and graduate students learn different aspects or applications of ethics, and what would be different?**

    - The immediate focus for undergrads is courses and academic integrity, while for graduate students the immediate focus is data collection, experimentation, RCR. There are also contextual/societal/cultural things to consider in research, classes, projects that ethics education can help with.
    - Students at these different levels are coming in with different levels of experience: grad students might have had some ethics education in their undergrad education, and undergrads may have had a co-op or internship which could have given them a glimpse of ethics in the workplace, and some undergrads may have no prior experience. Experience and age may contribute to a level of moral development that is higher for grad students (more mature) vs. undergrads.
    - There is some thought that some baseline/universal training should exist that would be applicable for all groups. After that there could be differentiations for topics in ethics that can be explored, such as by degree/discipline or career paths. But ethics should probably not be siloed into one experience, and it should be emphasized that the ethics skills are transferrable to various career settings (academia, research, industry). Perhaps more focus on decision making, and less on the rules.

2. **How do instructors introduce professional ethics to students so that they recognize its importance?**

    - Making it relatable.
        - For undergrads, cheating is a good place to start the conversation. Faculty are responsible for following up on cheating so that codes of conduct mean something.
        - Integrity in terms of abilities - honesty with self-assessment.
        - In design classes, instructors may bring up examples of past experiences and discuss what happened.
        - Pull examples from current events.
        - Instructors could share their own experiences/ be a story-teller
    - Create norms around ethics
        - Start with a common vocabulary
        - Come up with a process for ethical decision-making[1] and evaluating impacts
        - Talk about the different ethical frameworks and how they might be used.

[1] Some ethical decision-making frameworks mirror the design process, and include steps like 1. Identify an ethical problem, 2. Identify conflicting moral responsibilities, 3. Consider moral theories and rank, 4. Consider alternate courses of action and their implications, 5. Make decision, implement it, and monitor consequences. Some resources for this type of framework include Bero and Kuhlman (2011), Subbian and Shaw (2020) and Subbian et al (2022)

        - Give an example and ask what would do if strictly follow a framework and then what and how would you do this?
        - Explore the different ethical frameworks – try one by one, adopting a particular ethical framework and attempt to make life's decisions
    - Insert ethics often in the curriculum/course
        - Perhaps could embed as a subpart of a traditional/quantitative problem.
        - Teach smaller ethical decisions. 'Big' cases can lead to feeling that it won't happen to individuals. Need to put smaller ethical decisions in.
        - Use a good case study that is relevant to your class/project/research/etc. A lot of examples came up in the discussion including: Theranos, FTX, PlaySkool Travel Light, falsifying data to get a product on Amazon.
    - Let students know what support they have for ethics in the workplace (HR, etc). And talk about how friction can provide traction; Practice taking action in discomfort.
- Difficult things to overcome:
    - The students who may need ethics the most are the ones who don't take it seriously
    - Discussion can be difficult, especially younger/inexperienced students (often in DTC) have not had first-hand experience yet and think things are very clear / black and white. NOTE: DTC is often the first experience our students have with ethics.
    - Some students in certain internships have internalized the culture of the company where they work - ask fewer questions and make more money

3. How do instructors encourage (or require) students to employ professional ethics during decision making?

- Ethics can be included as an explicit part of the project/research/etc. For example, as part of the problem statement, an explicit part of the question, or **framing a quantitative question** in an ethical setting.
- Within class time there could be a break-out question that allows discussion before group sharing, or students may role play the systematic support for making ethical decisions, or instructors may point out where there are multiple paths to follow (but difficult because it clouds the options)
- We can also create specific moments to talk about ethics. Include "teachable moments" - put the student groups in situations that encourage discussion. Discussions of equity and impacts of their work on equity. Reflections on topics where ethics has an impact – teamwork and collaboration, professional competency, professional challenges, etc. And we can include ethics in extracurriculars, like ChBE Debate, ESW, DFA.
- Include as a topic in the course/research/interaction. Specific examples from the breakouts:
    - (Engineering Career Development) job offers: managing the offer timeline. (Working with recruiters.) Initiate conversations around timeline. Also,

professionalism and ethics concerning accepting a job offer and then backing out.
    - (Center For Leadership): Application of ethics framework
    - (Design Thinking and Communication): Human-centered design is a focus. Course encourages thinking about consequences.
        - First thing is to think about how the design impacts the client. (Example: clients with disabilities - working with other folks (PT/OT) to achieve rehabilitation goals.)
        - Design reviews – getting external perspectives because student lens can be limited, though not always.
    - (MSE): Define code of ethics and apply it to case study.
    - (IE): Embed ethical dilemmas into design case studies.
    - (BME): *Was it ethical*: difficult discussions about right/wrong - giving folks the vocabulary to explain why issues seem ethical/unethical.

4. **Do you or your department engage students on ethics in courses other than design? How?**

- Participants noted that there was a heavy reliance on ethics content in the design courses (DTC and capstone) but there were some other specific examples in other courses and experiences on campus:
    - Engineering Career Development teaches ethics with co-op
    - CS: Some in an elective course (Special Topics course: Computing, Ethics, and Society. Contains philosophical, ethical frameworks.)
    - Engineering Law - one class on ethics, illegal but ethical vs legal but unethical
    - Grad students go through Responsible Conduct of Research training; some undergrads learn a bit of this in undergrad research
    - Integrating DEI, societal contexts/impacts/issues into coursework
    - MIUs - moments of intense uncertainty - Joe Holtgreive - integrate ethics. Confidence to engage. Ethics are MIUs. Make it clear that ethics decisions can be hard, even if you know right thing to do. **Build resilience**.
- Participants also acknowledged some challenges of integrating ethics
    - Required courses are viewed differently, how to have the students pay attention to ethics materials in a required class “Sunday school avoidance syndrome”. Values are being challenged and they don’t want to be challenged on what is right or wrong.
    - Value in forcing students to be exposed to these topics, not forcing to change values, but learning how to apply these concepts in unfamiliar situations where outcome isn’t certain.
    - Very specific instances of ethics may not be universally applicable to other areas. For example, ethics in AI is different than ethics in another area.
- Other questions remained about implementation
    - Would students in an early career ethics course influence the other students as they mingle in later courses? Could there be “ethics fellows” or ethics TAs

- Certification? Would an incentive help? But this would need to be general across McCormick so how would that impact it. Notre Dame has a Technology Ethics Minor (engineering, CS, sociology, etc). Could be a model.

5. **How do instructors make students aware of what will be expected of engineers in their profession?**

   The consensus here was on variety of experiences. For example, different scenarios based on different career paths.

6. **What aspects of ethics education are missing in your curriculum (if any)?**

- Many participants acknowledged that aside from first year (DTC) and final year (capstone) in undergrad there isn't much integration throughout the curriculum, sending the message that the topic isn't valued.
- Some reasons why that might be and some potential challenges/hurdles
  - Faculty aren't equipped to do it, and also may not have equal levels of buy-in.
  - Quarter system makes it hard to fit in
  - Often included as an optional reading assignment.
  - Courses are pretty content- and direction-focused - ethics may seem separated from course material, especially if not assessed
  - We can make students aware of ethics, but then need to have them practice decision making
- Some ideas for what to add to curriculum:
  - Teaching to **exist in moments of discomfort.**
  - Could adding a learning objective on ethics to each class help improve longevity of the change? (Inertia.)
  - First-year [engineering] seminar with case studies from different areas?

Resources:

Bero, B., Kuhlman, A. Teaching Ethics to Engineers: Ethical Decision Making Parallels the Engineering Design Process. Sci Eng Ethics 17, 597–605 (2011). https://doi.org/10.1007/s11948-010-9213-7

Subbian, V., & Shaw, L. R. (2020, June), Piloting an Adaptive Ethical Decision-making Tool for Engineering Students Paper presented at 2020 ASEE Virtual Annual Conference Content Access, Virtual On line . 10.18260/1-2--35056. https://peer.asee.org/35056

Subbian, V., & Shaw, L., & Halpin, C. (2022, August), *Ethical Decision-Making Frameworks for Engineering Education: A Cross-Disciplinary Review* Paper presented at 2022 ASEE Annual Conference & Exposition, Minneapolis, MN. https://peer.asee.org/41669