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The IRB and Ethics Pedagogy for a Culture of Responsible Research

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In most U.S. higher education institutions, ethics is a general learning outcome. While the appeal of ethics as a learning outcome comes from its presumed universality, its application is inevitably situational, developed in response to needs and aspirations of communities of learners, as well as to institutions' norms and expectations (Jurkiewicz, 2014). This is especially true for research ethics pedagogy in higher education. Ethical concerns and actions in research are largely dependent on the field of research, the kind of research methods employed, the nature of research partnerships, and the configuration of research infrastructure (Askins, 2008; Löfström & Tammeleht 2023; Schrag, 2008; Singh, 2023; Swazey & Bird, 1995). A robust culture of responsible research thus needs facilitators and connectors who do the work of translation among various actors including students, faculty, staff, the higher education institution, and a range of local and national entities that make and enforce laws and regulations.

In the U.S. a great deal of this type of translation happens through the Institutional Review Board (IRB) submission and review process. Yet, at our own institution, Worcester Polytechnic Institute (WPI), not unlike many others in the U.S., the IRB tends to be left out of research ethics pedagogy conversations. In the academic year of 2022-23 a group of five faculty members (coauthors Bhada, Riddick, Smith, Stanlick, and Telliel) came together with co-author McKeogh the Director of WPI's Human Subjects Research Programs. Our collaboration led to

the formation of a professional learning community that was funded by the university's center for teaching and learning. In this professional learning community we asked: *what would our ecosystem of research ethics look like if we leverage the IRB processes for intentional and reflective ethics learning?*

Adding to the Human Subjects Research Programs director McKeogh's expertise in the management of research ethics protocols and procedures, our interdisciplinary faculty team brought insights from several academic research fields, including systems engineering, computer science, media studies, professional writing, community engagement, and cultural anthropology. The learning community met throughout the academic year of 2022-23 to study WPI students' needs and aspirations as well as to explore experiential learning approaches to *ethics training across the curriculum*. As part of our collaborative work, we developed a pedagogical framework that approaches the IRB as a learning opportunity that is meaningful and transformative.

This framework addresses two major challenges each of us has encountered in our undergraduate project advising: cultivating researcher identity and human impacts of research:

1. The first challenge is the tendency among students to shy away from building a strong sense of researcher identity in student projects that have research components. Whether involving 'human subjects' or not, most of our students often assume that research is a discovery of knowledge that did not exist. This assumption does not take into account the fact that research (a) happens through various types of inquiries (discovery, synthesis, or application), and (b) knowledge creation can be gradual, cumulative, or nonlinear, and is rarely a leap to an unknown place. From research ethics pedagogy, this is especially troublesome because if students do not actively identify themselves as researchers, they

tend to approach research ethics as a bureaucratic formality—and not a matter of personal responsibility (Löfström 2012).

2. The second is about the difficulty that students have in identifying 'humans' that may be impacted by research. This is especially a challenge for research projects involving technology. Indeed, many undergraduate research projects at WPI, a predominantly-STEM institution, involve the design, development, test, implementation, analysis, and use of technologies. Techno-centrism (at the expense of a human-centric approach to technology) is not unique to undergraduate research projects. Many of the ethical problems with current commercialized technologies such as facial recognition systems are indeed a reflection of the widespread techno-centrism in the tech industry (Morozov, 2013; Sims, 2017). In such a techno-centric framing, either humans become means to achieve the goal of building a technological system or ethical concerns about humans only appear as afterthoughts.

The IRB application and review processes afford intentional and reflective perspectives on these two challenges. From the perspective of ethics training across curriculum (Davis, Hildt & Laas 2016), the intellectual space that the IRB provides is crucial to connect pedagogical practices across various research areas. By encouraging 'what if' inquiries, the IRB application process takes student researchers away from their comfort zones.

We argue that these two challenges—in contrast to other research ethics pedagogy challenges—carry a significant potential to become the vehicles that can create meaningful and transformative engagements with the IRB. With a sustained emphasis on these two challenges, research ethics pedagogy can foster a culture of responsible research. Our framework thus represents a shift from *research ethics*—wherein ethics is seen primarily as something that is

dealt with after research questions and activities are prepared—to *the ethics of research*—wherein students are trained to see research design itself as an ethical inquiry. We suggest that this shift provides a framework for STEM students to understand the human dimensions of their work and the need for skill-building for ethical conduct of research (Stanlick & Reynolds 2023).

Cultivating Research Identities

WPI is a STEM institution that has an integrative curriculum incorporating humanities and social science exploration. Undergraduate students who engage in research are at a critical stage of professional identity formation, as they transition from being a consumer to a producer of knowledge (Dutta, Pashak, McCullough, Weaver & Heron, 2019). Approximately 30% of our students opt into a first-year, project-based experience that is interdisciplinary, often outside of their major, and wicked problem-focused seminar. Thus, the first experience students have with research is typically *outside* of their major area and is a human-subjects research project.

Yet, in our collective experiences, students do not tend to understand these projects as being "research," or indeed their own identities as that of a researcher. Students often focus heavily on practical skills development, which they perceive as necessary to get a job after they complete their degree. Thus, in a research methods course, students who are accustomed to skills development are often focused on the form and mechanics of research, rather than on the underlying purpose of knowledge creation. In a design or engineering project, students can easily become more focused on what they see as the core skills of their discipline (i.e. the skills necessary to create the artifact) rather than the skills of human dynamics, utility in community, or ethical impact. These skills are directing students toward norms of product development, where interaction with humans is—at best—a means toward improving the product deliverable,

rather than a systematic method for reflecting upon the design or learning about human behavior. Sometimes discussed as "soft skills," the non-technical is often dismissed or degraded as an afterthought or a diversion from the "real" work of the discipline (Goldberg & Somerville, 2014).

Students may also struggle to think of themselves as researchers when they are engaging with interactive digital technologies like social media. The IRB's current definition of "human subjects research" does not readily account for certain forms of social media research (Riddick 2024). For instance, researchers may initially think they are not performing human subjects research in a social-media research project because they do not use methods like polls, surveys, or interviews—that is, methods in which they directly "engage" with participants in their study. However, researchers may not realize that other, less established methodological choices could be considered an online form of engagement. In other words, the IRB currently provides a useful starting place for reflecting on the ethics of social media research, but students who rely solely on this training to establish their research methods may not realize the many ways in which their methods could qualify as human subjects research, even if these methods are not yet formally defined as such.

Broadening Definitions of Technology and Society

Undergraduate projects focusing on technology present a set of challenges for ethics research pedagogy. These challenges are primarily about the narrow definitions of "the social" in sociotechnical systems. For instance, in engineering design courses, the traditional engineering ethics curriculum puts emphasis on professional commitment to safety and adherence to standards, regulations, and policies. While these are, of course, extremely important for the

formation of an engineering student, such an emphasis assumes that standards, regulations, or policies are not flawed. It does not encourage meta-level reflection on what is expected to be adhered to. Furthermore, compliance-focused ethics pedagogy in an engineering design course overlooks the intersecting axes of ethical analyses based on safety, equity, inclusivity, and accessibility. With complex engineered systems such as smart cities, self-driving vehicles, or AI-based decision support tools, the potential impact on society is significant. A narrow definition of 'engineering ethics' is not only insufficient but can also be damaging as it renders certain social concerns invisible and unproblematic and, as such, outside of ethical reflection (Lynch & Kline 2017). This is indeed one of the obstacles to developing a strong focus on racism and sexism within engineering ethics pedagogy.

In engineering design classes, one common research activity is stakeholder analysis. As a process of collecting information about people who can impact or will be impacted by a project, stakeholder analysis is taught to help students learn to determine engineering requirements for a given project. While it serves as a good starting place to think about the broader social impact of a technological system (Mohedas, Sienko, Daly & Cravens, 2020), it tends to simplify societal complexities. Because of its focus on quantifiable data, the stakeholder analysis research tends to disregard many nuances underlying diverse stakeholder populations and their needs. Furthermore, ethical concerns such as equity or reparation are demands for the transformation of structural power asymmetries among stakeholders. In order to accommodate such concerns, a stakeholder analysis framework then needs to consider research ethics as an extension of transformative justice.

Our learning community had similar concerns with ethics pedagogy conversations with regards to generative AI. Ethical critiques link generative AI to cheapening artistic and

intellectual expression through automation, and amplifying dominant power structures and social norms. In response, some claim that "AI is just a tool," indicating that generative AI applications only do what human users want them to do. This reframing is both empowering and problematic. It is surely an effective response to technology-driven moral panics because it reasserts the role of human skills and control. Yet, it carries a risk of de-politicization. Because tools are commonly viewed as passive, manipulable, and unthreatening, the idea of 'AI-as-tool' tends to mask this technology's constitutive role in embedding racial, gender, and other social ideologies in textual or image generation (Boucher, Smith & Telliel, 2024). Our definition of what a technology is (is AI a tool?, etc.) comes to have implications on how we conceptualize its human impact. For instance, with the tool metaphor, there is still room for ethical reflection in the classroom, yet it is now only a matter of the individual user's ethical concern. By switching to different conceptualizations of generative AI, ethics pedagogy might be able to point to a different range of ethical concerns beyond the individual user (environmental concerns, cultural bias, intellectual property, etc.).

Leveraging the IRB Processes

In response to these concerns, our learning community turned to the IRB application process as a possible leverage point to consider broader or multiple definitions of "technology" and "human impact." The purpose of an IRB review is to assure that appropriate steps are taken to protect the welfare, rights, and privacy of humans participating as subjects in the research. From the IRB's perspective, the researcher has an obligation to treat data gathering with the necessary guidelines provided by an IRB while developing the protocol. To guide this process, all researchers take the

human subjects in research training modules provided by CITI training. These modules position the student or faculty member to consider their role in the research process.

The IRB asks researchers to develop a protocol that considers each human subject participating in or being impacted by research activities as an individual with autonomy for decision-making. Then, the researcher is expected to delve into the hypothesis of the *what if*'s of the research and navigate the best path in research design. The *what if*'s of the research design highlight issues of risk and responsibility. In many ways, the IRB application is a mapping of potential risks with plans to avoid, mitigate, and accommodate some of these risks (indeed, every research impacting humans has risks, and thus invites ethical response). This myriad of risks can create obstacles for researchers who want to go ahead with their research project. This is where the regulatory body of the IRB comes to the assistance of researchers to help with the *what if*'s and support researchers in their plans to mitigate harm to human participants.

From a formalistic view, this whole process is ponderous. This is why many of our students tend to approach the IRB process as a matter of a bureaucratic formality that needs to be taken care of before "actual work" begins. From the perspective of research ethics pedagogy, however, the IRB process is full of opportunities to generate self-inquiries. The IRB application process indeed requires a great deal of learning. *What if* questions also invite a processual approach that considers every aspect of research design as a matter of potential ethical concern. As such, research design itself becomes an ethical inquiry. What we propose is to turn the learning that happens as part of the IRB application process into an opportunity to further undergraduate students' capabilities of ethical reflection on their work as researchers. This means to reclaim the IRB as part of a new culture of research ethics—by shifting from a view of

the IRB focusing on its regulatory responsibilities to a view centering on its often-latent educational mission.

We propose this step-by-step framework to leverage the IRB application in undergraduate research for building a *robust culture of research ethics pedagogy*:

- Mapping 'human experience' of technology (psychological, environmental, social, or political impacts)
- Providing opportunities for students to reflect on their roles and responsibilities as researchers
- Introducing ‘responsible research’ vocabulary for students to make sense of technology’s human impact
- Helping students understand ‘why’ they engage with IRB protocols, and ‘how’ they can approach research ethics as something applicable to their project

Conclusion

Technocentrism (and its various manifestations, including technosolutionism) is a constant threat to our ability to carefully consider the consequences of what is created through research in our institutions and beyond. As a team of engineers, scientists, and humanists, we face increasing concerns about the fast pace of technical innovation and the accompanying training to support ethical reasoning in our students. This concern and opportunity prompted our year-long self-study of our own pedagogy and evaluation of opportunities throughout WPI to better connect the ethical conduct of research to the project-based curriculum. Through our learning community, we have identified numerous promising practices and areas of growth for this type of ethical pedagogical training. Some are topical and case-based, connecting ethical reasoning and

evaluating consequences of engineering design, social media, or AI. Others are threads to weave through majors or programs, such as ethical approaches to engineering design. Finally, we also explored more intangible, philosophical questions of researcher identity and how to support that in our students' education. Through this exploration, we affirm that cultivating ethical research identities through scaffolded, connected experiences and training is essential for thoughtful scholar-practitioners in STEM fields.

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