A BRIEF INTRODUCTION TO THE DEBATING SCIENCE PROGRAM:
ETHICS EDUCATION THROUGH DELIBERATION

Science and technology are increasingly thrown into the chaotic arena of public debate. Since the public has much at stake, this is probably as it should be. Unfortunately, by most accounts these debates have gone poorly. For example, the many issues surrounding global climate change have been the object of polarizing disagreement for decades. Innovations in agricultural biotechnology have been the subject of a hostile international dispute for over twenty years. Powerful new developments in nanotechnology promising breakthroughs in arenas such as energy, materials, and medicine are receiving the same treatment: contentious, adversarial debate. We urgently need to reconsider the form and quality of these debates. The stakes are too high in areas such as nanotechnology, agricultural biotechnology, and global climate change for conflict and manipulative discourse to be decisive.

Scientists can contribute to improving the quality of these debates by becoming more active and effective participants. However, there has been little formal effort through coursework to bridge the gap between scientific research and social debates. This project is designed to help address this need. Toward that end, this program has two main objectives. The first is to help students to become better informed about the scientific, ethical and social issues arising in contemporary science debates. The second is to provide an opportunity for students to practice discussing these issues across disciplines to develop the proper habits of ethical deliberation.
Deliberative dialogue is concerned with making real-life decisions about setting and prioritizing goals and selecting the most appropriate means to achieve these goals. This project is structured around a specific model to guide deliberations and organize discussions. To briefly introduce this model, it divides discussions into five general areas, where students will: (1) characterize ethical and social goals, (2) list competing alternatives, (3) discuss practical obstacles, (4) analyze unwanted side effects, and (5) articulate a conclusion in the form a policy recommendation.¹ In brief, students participating in this program deliberate together to articulate social and ethical goals, weigh the various options for achieving these goals, and arrive at well-considered policy recommendations.

This project’s focus on deliberation rather than debate is an alternative approach to teaching applied ethics. To briefly explain, debate is a common format used in textbooks and anthologies that address controversial ethical issues in science and technology. In these texts, one will often find balanced sets of essays providing readers with articles for and against issues such as genetic engineering, animal experimentation, cloning, and so on. Debate presupposes two sides that have competing opinions and very different assumptions about fundamental values. Debate has a place in our culture and it teaches important skills, but it should not dominate the ways we discuss important policy choices. Nonetheless, the debate format reflects current political realities. This is obvious in the typical style of news and political programming, where talking heads will pop on the screen, take sides and go at each other on cue. Popular media seems to actively promote a political culture of adversarial debate.

¹ The model will be explained in more detail later in the paper.
One of the major defects of the debate format, both in politics and education, is that it oversimplifies complex and uncertain ethical issues. Controversial issues in science and technology can rarely be bifurcated into neatly opposing position. While debate does teach the skills of defending a position and criticizing opposing ones, it does not develop the mental habits of comprehensively and systematically working through difficult issues with other people. Rather than mimic defects in current public discourse, this program provides an alternative practice in systematic ethical deliberation.

The Debating Science project is based on two additional assumptions. The first is that ethical deliberation requires certain moral attributes and that the practice of cooperative deliberation can support the development of these attributes. The second is that the deliberative process requires one to place scientific research and technological developments in a larger social and ethical context. Let us consider in more detail that first assumption.

The moral attributes of a good deliberator are built upon the human capacity for practical reason. Practical reason simply refers to the “human capacity for resolving, through reflection, the question of what one [should] to do.” Practical wisdom is the moral development of this capacity through the practice of deliberation.

While the term “practical wisdom” is not an active part of most people’s moral vocabulary, we are all familiar with the consequences of its absence. It is easy to think of

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3 The philosopher, Martha Nussbaum writes of practical reason: “All humans participate (or try to) in the planning and managing of their own lives, asking and answering questions about what is good and how one should live... This general capacity has many concrete forms and is related in complex ways to other capacities, emotional, imaginative, and intellectual. But a being who altogether lacks this would not be likely to be regarded as fully human in any society.” Martha C. Nussbaum, “Human Functioning and Social Justice: In Defense of Aristotelian Essentialism,” Political Theory, Vol. 20, No. 2 (May, 1992), pp. 202-246.
at least one pain-in-the-neck-moralist whose sincere morality lacks the guidance of practical wisdom. This has been an important factor in recent science debates. In all three cases, the nanotechnology, climate change and agricultural biotechnology debates, one can readily identify well-meaning people guided by deeply felt moral convictions who are championing unreal and irrational positions. Such single-minded people can hinder productive deliberations. In short, morality without practical wisdom can be pointless, irritating, or dangerous.⁴

Practical wisdom is the ability to fruitfully engage in cooperative deliberations with the purpose of selecting intelligent and ethical goals, and to discern appropriate and effective means to achieve those goals. This program, then, seeks to promote practical wisdom through the practice of cooperative deliberation. But what kind of moral attributes should participants seek to develop?

In a recent book on deliberative democracy, political philosopher Robert Talisse provides a preliminary list of the moral excellences of deliberation (i.e., the attributes of practical wisdom).⁵ His list includes honesty, modesty, charity and integrity. Excellent deliberators are honest because they are willing to admit that their favored position might turn out, upon closer examination, to be faulty, narrow minded or in need of revision. They are willing to consider all the evidence and to give all proposals a fair appraisal before deciding on a policy. Excellent deliberators are modest because even the best intentioned plans and policies can be ineffective or fail in practice. Modest deliberators understand that political proposals are not ultimate solutions. Hence they are able to admit error and seek correction. Charity means listening to the proposals one does not

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agree with. This requires rejecting simplistic categories that give rise to prejudices, such as of “pro” and “con”, “left” and “right”, “conservative” and “liberal”. Excellent deliberators see these polarizing ideological categories as obstacles to deliberation. Finally, the deliberator who embodies the virtue of integrity understands that, “however divided he and his fellow citizens otherwise may be, they nonetheless are joined in the common and continuing undertaking of self-government.” This requires being committed to the ideal of self-governance through the reasonable exchange of ideas. The purpose of focusing on deliberation as a basis for ethics education is to provide awareness of these excellences.

STRUCTURING THE DELIBERATIONS

The second assumption guiding this exercise in ethics education is that the model used to structure of these deliberations requires participants to fully consider the larger social and ethical dimensions of scientific research. As earlier mentioned, this program is organized by a specific model for deliberations, represented by Figure 1. This model encourages students to discover and discuss ethical issues as they arise within the context of existing policy disputes over science and technology. This means that students will begin deliberations by discussing issues in social and environmental justice, and examining the ethical components of key normative concepts such as sustainability, food security, precaution, international justice, and the like.

The model in Fig. 1 guides deliberation in three ways: 1) it helps to organize discussions into a coherent whole, 2) it serves to integrate the ethical and the scientific discourses, and, 3) it makes explicit the pattern of reasoning employed in order to
facilitate critical reflection and discussion. As mentioned, the deliberative process represented by this model is divided into five areas of discussion: (1) goals (ends or goods), (2) alternatives, (3) practical obstacles, (4) unwanted side effects, and (5) conclusion (i.e., a policy recommendation).

Figure 1

The double arrows in the figure above indicate a dynamic, dialogical process. This means that each of the five areas of discussion can be revisited unless some point of no return has been reached. This flexibility accommodates changes and modifications in positions through dialogue and when new facts or developments come to light. The instructional strategy is to divide the components of the course into the five general areas of the model. Students will read selected essays, conduct group research and discuss the main issue in the context of each of the five areas of discussion.

The three Debating Science courses take place on the Online Deliberation Center (ODC). The ODC provides an online environment where students will discuss issues with their instructors, the occasional visiting expert, and other graduate students from a variety
of disciplines and research interests. The ODC is tooled with a wide variety of on-line features to assist participants in the deliberative process.

Deliberations begin in the ODC by asking the straightforward question: What goals, ends or goods are we seeking with this line of research and technological development? More specifically, in public debates over biotechnology, nanotechnology, and climate change, students must ask: What goals, ends or goods are we trying to achieve with specific developments in agricultural biotechnology, nanotechnology, or climate change? In all three of these areas, it will immediately become apparent that the process of characterizing goals requires both scientific and ethical inputs.

No doubt, there will be disagreement on how to best characterize these goals. Students will need to utilize some of the previously mentioned excellences of a deliberator (e.g., honesty and charity) to work through these disagreements. Discussion will be needed to address at least three types of issues, including framing the problem, defining key concepts, and considering interdependent goals. For example, two goals that are frequently mentioned in the debate over agricultural biotechnology are food security and sustainability. However, there is considerable international disagreement over whether food security is best framed as a social and political problem or a technological one. In addition, key normative concepts in these debates, like justice, fairness, and sustainability, are ambiguous and contested. For example, in the climate change debate there are competing accounts of justice to guide the distribution of costs and benefits for reducing greenhouse gasses. Students will need to research and discuss these important concepts in order to characterize and clarify goals. It is through the process of
characterizing goals that student examine the larger social and ethical context for research.

Once the dialogue over goals has proceeded to a high level of sophistication, students next ask: What alternatives exist for pursuing these goals? Deliberation is done in light of competing alternatives. So a key task is to develop a provisional list of viable alternative methods for achieving the stated goals. This is not a theoretical exercise, but a pragmatic one. The starting point is real-life social debates over biotechnology, nanotechnology, and meeting the challenges of global climate change. Only those alternatives that are contenders in these debates need be considered. Students need to be realistic and pragmatic about alternatives.

With goals and alternative established, students ask: Are there practical obstacles that make it impossible or improbable to achieve these goals with this means? Can we evaluate means according to their practicality and efficacy? Does the science support this particular alternative as a realistic means for achieving this goal? Are there institutions in place that would allow for the application or diffusion of this technology? Fruitful dialogue on practical obstacles must be interdisciplinary. One can only intelligently discuss these questions if there is accurate knowledge of the science involved and adequate ethical and political sophistication.

The next area of discussion in the model represented by Figure 1 is side-effects. Deliberators ask the question: In pursuing these goals with this particular means are we likely to generate unwanted side effects? For example, nanotechnologies raise numerous as yet unanswered questions about the biological effects of particles small enough to make their way into the nucleus of the cell or to cross the blood-brain barrier. Further
ethical questions are raised by the fact that new technologies are not socially 
(economically and politically) neutral. Technological change frequently creates winners 
and losers. The basic question students will explore is: in pursuing these goals with this 
means, are we likely to create more, or worse, problems than we solve?

In addition, since these questions are often about potential side effects, ethical and 
scientific discussions are needed to determine how to deal with the uncertainty inherent 
in such predictions. The recent discussion over the “precautionary principle” highlights 
this point. Students must discuss how to deal with the uncertainty inherent in such 
predications in a scientifically and ethically responsible manner.

When these areas have been adequately discussed and deliberated over, students 
will work together to arrive at a policy recommendation. This final step ties together 
everything in the deliberative process. Students must collaborate to write a 
recommendation based on comprehensive considerations of what has been written in the 
goals, side effects, obstacles and alternatives areas. It is hoped that through this process 
participants will have learned some of the virtues necessary for practical wisdom, will be 
in a better position to consider the larger social and ethical issues at stake, and will 
become more intentional and sophisticated about ethical deliberation.

CONCLUSION

Debating science project is a program in ethics education through cooperative 
deliberation. It employs a specific model of deliberation designed to help students 1) 
practice the virtues of a good deliberator and 2) set their deliberations in the appropriate 
scientific and ethical context. The Online Deliberation Center employed in this project is
designed to facilitate these two learning outcomes. Through engaging with national and international experts, some carefully selected web resources, and a group of talented peers from across the country, students will be guided through a cooperative deliberative process by their instructors. By the end of the term, students will have discussed significant and complex issues affecting policy that surround their chosen area interest, agricultural biotechnology, nanotechnology, or climate change. Assuming some hard and satisfying work by all involved, by the end of the project participants will be more adept at engaging in deliberative dialogue across the disciplines on some of the most important scientific and ethical issues of our time.