In a research project in the Netherlands we are exploring if and how practical tools for ethical deliberation on the impact of technology can be helpful in ethics education for engineering students. The approach is tool based, intended as a variation on theories in ethics and technology. And the approach uses a focus on the impact of technology as a way toward ethical deliberation. Both characteristics are intended to better appeal to engineering students.

Systematic and critical thinking about societal and ethical aspects of technology is not yet regularly included in higher education programs. Not in the least because teachers find it rather difficult to discuss ethical questions about the impact of technology with students. However, nowadays ethical deliberation on the impact and meaning of technological choices, makes up a necessary component of the research, design and development process. As future professionals (researchers included) our present students are expected to be fully aware of societal and ethical effects of technological innovations. Therefore, educational programs should include a teaching track for ethics of technology to turn students into responsible professionals. Knowledge of ethical theories does not seem the most important aspect here. Much more, students should become sensitive for the meaning and effects of technology. Our hypothesis is that active tools will be most appropriate to learn students deliberating about the impact of technology.

In a first phase of the research project, experiences of students and teachers indicated that practical tools for ethical deliberation are most valuable, provided that they are to linked to explicit learning goals. The tools should be designed to cover different topics of ethical deliberation. In addition, it appeared to be important to determine direction and ambitions for ethical deliberation about the impact of technology. More than a one-time exercise, ethical deliberation should be an integrated part of the education program. Different tools should be applied toward different goals in a teaching track for ethics of technology. In this workshop questions about aim and content of a valid teaching track for ethics on the impact of technology in engineering education, will be addressed.

In our research project we identified several topics for ethical deliberations based on literature (Van Beveren et al., 2018; Marin, 2020; Van der Poel, 2018) and our own
experience in engineering education (Dorrestijn, 2017; Tijink & Verbeek, 2019). These topics represent ethical issues accompanying technology, the *whats or whereabouts* students should learn to think about in a systematic and critical way. Taking the impact of technology as a starting point, we ran across topics such as the ambivalence of technology, intentional and unintentional effects of technology and changing behavior and values.

For defining direction and ambitions for ethical deliberation we used elements and levels which we came across in several definitions about reflective skills (Mittendorff, 2014; Kember et al., 2008). So, an essential element for ethical deliberation is that it should start with the use of a practical example of an innovation or new technological application concerning the professional context of the future professionals. As to the extent and depth of ethical deliberation in engineering education we initially distinguished three different levels to deliberate on the impact of technology: evaluation, reflection and critical reflection.

In this workshop (60 min) we will facilitate a dialogue among participants of various engineering education programs about two key questions to uncover the most important ingredients for a tool based teaching track.

1. Which topics for ethical deliberation on the impact of technology should be defined?

2. Which direction and ambitions for ethical deliberation should be set to help students developing the appropriate attitude for ethical deliberation on the impact of technology?

In the first part of the workshop (45 min) the participants will exchange their thoughts and experiences about the two key questions in small groups. We will discuss the above mentioned identified topics for ethical deliberation on the impact of technology and complete them with other topics the participants will bring up (question 1). To address question 2 different elements and levels for ethical deliberation will be reviewed. Aim is to end with a framework for a tool based teaching track for ethical deliberation on the impact of technology consisting the most valid topics and direction and ambitions.

In the second part (15 min) we will present an example of a tool specially designed to fit in a teaching track for ethical deliberation on the impact of technology.

After the workshop (60 min) the participants will leave with a framework of the most valid topics and direction and ambitions for a tool based teaching track for ethical deliberation on the impact of technology. Besides that they will have experienced the working of a practical tool for ethical deliberation. Holding this the participants could take a first step developing a teaching track for ethics of technology adjusted to their specific educational programs and students.
References


