



Guelph Engineering Leadership Program 2022-23

Workshop 4: Embedding Social Justice in Engineering

Activity 3: Engineering for Social Justice Case Studies

Instructions:

In your breakout group, you will focus on **one** case study that tackles social justice work and discuss the reflection questions with your peers. If time permits, you may move on to other cases. Please note that one person from each group should bring back the group's discussion to the main room. Feel free to pick someone amongst yourselves!

The following case studies identify work that can be characterized as engineering for social justice. Each case study showcases different strategies or approaches to social justice work. Not everyone involved in the organizations presented here is an engineer by training, or even an engineer as defined by what they do in some conventional sense (eg, design, technical analysis). But the work is engineering for social justice, work that engineers interested in social justice might aspire to undertake.

Some things you might want to keep in mind as you read through these case studies are: *Will their strategy produce the kind of change intended? Will new social justice problems be created as a by-product? Is there something they have not taken into account, someone left out, someone adversely affected?*

Case Study 1

Barbara Waugh writes in her memoir about her career as a change agent at Hewlett-Packard (HP), where she increased minority hires, created networks for isolated and tokenized women, reversed HP's support for Governor Wilson's budget reforms that would have cut benefits for Aid to Families with Dependent Children in California, and visioned and implemented global corporate responsibility for HP. A former activist in the civil rights movement, the peace movement, and the women's movement, she felt that she would have more impact in the corporate sector and brought all of her tools from social justice work to her career at the company. She describes in detail how she made changes in each case, utilizing many important skills such as building relationships, reframing issues, amplifying the positive work already taking place, creating opportunities to bring like-minded people together, understanding the larger context, and remembering who she works for (hint: it is not HP). Barbara Waugh does not have a background in engineering but in psychology and theology (and she suggests that this placed her on the margins in HP and made her less threatening and able to accomplish more). However, her memoir contains stories of co-conspirators who are engineers and were drivers for change as well. An engineer could follow her example to be a change agent in any corporate context, provided that she/he/they learns the tools and approaches.

One could also be a change agent within other kinds of organizations, such as an engineering professional society. Most have policy committees that can create statements for approval by the professional society, which translates into government advocacy.

Case Study 2

One World Health is a non-profit pharmaceutical company with a plan to provide affordable drugs for infectious diseases in the developing world. Victoria Hale, a former Food and Drug Administration (FDA) drug evaluator and researcher who left Genentech in 1998 with a list of ailments for-profit firms neglected or were unable to address cost-effectively, founded the Institute for One World Health. She began working immediately on a drug to treat visceral leishmaniasis, which infects about half a million people a year in India, Bangladesh, Nepal, Sudan, and Brazil; of these, about 200,000 die. The new drug, approved by the Indian government in 2006, shows a 94.6% cure rate and stimulates an immune response that offers lifelong protection from future infections. The One World Health website projects a cost of \$10 per course of treatment, about one-tenth the cost of current treatments. The company accepts donated intellectual property and utilizes in-country pharmaceutical production facilities to keep costs down. It draws on the expertise of many scientists and engineers around the world with years of experience in the pharmaceutical industry and infectious disease research. Moreover, it creates an environment in which for-profit firms are more likely to partner with non-profit firms.

Case Study 3

Community-based rehabilitation expert David Werner and the Program of Rehabilitation Organized by Disabled Youth of Western Mexico (PROJIMIO), a grassroots rehabilitation non-profit organization run and organized by disabled youth in Mexico, have written a book full of examples of approaches to individualized assistive technologies designed in context. PROJIMO is a community group of disabled people in Mexico who collaborate with users to create assistive devices that meet users' needs, which vary based on any number of factors such as day-to-day activities and interests, cultural expectations, and the surrounding physical environment. The back of the book lists nearly 50 organizations around the world doing similar work in Norway and Zimbabwe, Sri Lanka and Guyana, Thailand, and Nicaragua. Werner is a biologist and educator who joined the work via an interest in health and later became an engineer of assistive technologies, along with many users with whom he works collaboratively. Engineering professor Peter Pfaelzer and attorney Marc Krizack describe a descriptive design process used at Whirlwind Wheelchair International, in which wheelchair riders play an active collaborative role. Whirlwind Wheelchair grew out of a partnership between Ralf Hotchkiss, a wheelchair rider who began designing low-cost wheelchairs suited to use in developing communities around 1980, and Peter Pfaelzer. Today, they continue to teach their collaborative design methodology and advocate for policies and practices that lead to individuals in developing countries obtaining wheelchairs that best enable them to pursue their activities and interests independently and be involved with their community and society.

The models represented here empower users by involving them meaningfully in the design process, thus providing assistive technologies that support participation in community and individual independence. The employed design processes change the relationship of people to the technologies they use and upend a power dynamic that perpetuates dependence, gaps in communication and understanding, and suboptimal designs for assistive devices.

Reflection Questions

1. Which one of the 5 principles of social justice do you think most applies? (**Access, Equity, Diversity, Participation, Human Rights**)
2. Who benefits from this project?
3. How does this project contribute to a more equitable, diverse, and inclusive world?
4. Are there any negative consequences or impacts that may arise from this project?
5. Based on the case study, what can you, as an engineer and as a leader, take away to support a more socially just world?