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## **Infusing Your Course with Social and Environmental Justice and Ethics Discussions**

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## **Infusing Your Course with Social and Environmental Justice and Ethics Discussions**

**Abstract:** As educators, it is our responsibility to not only teach our students but to guide them towards becoming responsible, empathetic, and ethical members of society. Engineering education must encompass an understanding of social and environmental justice and ethics, as the actions of these professionals have significant impacts on the health and welfare of the environment and society. This paper discusses how to infuse a class with social justice, environmental justice and ethics discussions, the importance of awareness, how to prepare students for uncomfortable conversations and how to tackle the potential resistance that may arise due to the diverse perspectives and experiences of students. Creating class norms collaboratively with students and ensuring that the voices of underrepresented students are heard can create an inclusive and equitable environment for fruitful discussions. A good way to start coverage of social justice, environmental justice, and ethics would be getting the conversation going by asking the students to define what these terms mean to them and continually involving the students through class discussions as environmental and social justice concerns are presented. The student interest could be maintained through reviewing of impactful video clips and news articles. Another way to provide practical skills and knowledge to the students can be achieved through a short project where the students are asked to use tools such as the one created and by the Environmental Protection Agency: Environmental Justice Screening and Mapping Tool. Once the students get familiar with the tool, they are asked to identify a pollution issue, investigate the affected communities, prepare a short report and presentation to share their findings with the whole class. Through the class discussions, and the short project, the importance of awareness, knowledge, gaining skills, and taking action in the pursuit of ethics and justice may be instilled in the students.

## **Importance of Social Justice, Environmental Justice and Ethics Discussions in Class**

As educators, it is our responsibility to not only teach our students on the engineering concepts, but to guide them towards becoming responsible, empathetic, and ethical members of society. Engineering education, particularly Civil and Environmental Engineering, must encompass an understanding of social and environmental justice and ethics (SJ, EJ and EE), as the actions of these professionals have significant impacts on the health and welfare of the environment and society (Van de Poel and Verbeek, 2006; Cumming-Potvin and Currie, 2013; Leydens and Lucena, 2018). There has been an unfortunate number of cases where engineering design resulted in various impacts on different groups of people, either because of accidental or willful ignorance and sometimes due to intentional acts or policymaking. During the routing and construction of federal highway system, African American communities were significantly affected (Karas, 2015). Bullard et al. (2008) reported that the toxic waste facilities would be placed near communities of color, and we all have witnessed the struggles of the under-privileged communities in Flint, MI for the last several years due to contaminated tap water (Greenberg, 2016). The coverage of EJ and EE lends itself easily to many environmental engineering courses, especially at the junior and senior level. However, any engineering discipline may find many case studies related to engineering practices and SJ and ethics (Kahl and Hollander, 2010). Educators, when covering ethics, mainly focus on code of ethics, case studies, and ethical frameworks. Even though these efforts provide the students with ethical reasoning skills, they lack the emphasis on importance and understanding of ethical behavior (Bairaktarova and Woodcock, 2017). Covering ethics in the context of SJ and EJ may aid in developing ethical behavior in students.

We live in a society where people come from diverse backgrounds and have varying lived experiences, which shape their perspectives and understanding of the world. Introducing SJ, EJ and EE discussions in class can be uncomfortable as instructors and students bring their own perspectives and experiences. This may lead to pushback and resistance, especially by the students who come from non-minority groups, which can be challenging for the instructors to manage. Even though there is deliberate push for improving diversity in student and faculty the majority persists to be mainly comprised of white men (Khan et al., 2020). However, this should not hold the instructors back, it is important to remember that any action starts with awareness. Therefore, the first step to bring everyone to the table is to share your intention in covering these topics with students. This provides students with a clear understanding of the goals and objectives of the concepts to be discussed, which can help alleviate any resistance that may arise.

### **Crating a Safe Space for Discussions while Ensuring Inclusivity and Equitability**

Creating class norms is another effective approach to prepare students for SJ, EJ and EE discussions. This can be achieved by allowing students to participate in the development of class norms. Sensoy and DiAngelo (2014) propose that the creation of class norms should involve both instructor-led and student-led approaches. The norms should be developed collaboratively, and students should be allowed to voice their opinions on what they believe are acceptable and unacceptable behaviors during discussions. This process can help students feel more comfortable and establish a safe space for open and honest discussions. To ensure that the voices of underrepresented students are heard, the instructor must be a leader during the discussions. It is the instructor's responsibility to ensure that every student has an opportunity to share their views,

and that the views of marginalized groups are heard and respected. This approach helps to create an inclusive and equitable environment for all students. Suggestions for some of the module norms that may be proposed by the instructor include: 1-Stay open minded and engaged in the conversation; 2-Respect different opinions; 3-Challenge ideas and not the students.

### **Teaching Social and Environmental Justice and Ethics**

The roadmap to ethics and justice goes through awareness, knowledge, gaining skills, and action. Therefore, when covering EE in class, it is essential to start with the basics, including the definition of ethical, moral, and legal. Additionally, students can share their experiences with ethical dilemmas, and the instructor can introduce the code of ethics, discussing the responsibilities of professionals to society, employers/clients, and colleagues. The use of case studies brought up by the instructor as well as the ones the students research and find can foster the discussions on the topic (McGinn, 2003; Rabins, 1998).

Any EJ coverage in class brings along SJ concerns, and it is best to cover both concepts simultaneously. Therefore, starting with basic definitions, especially developed by the students is a great starting point. The students may start by reflecting on what these terms mean to them, then get in groups to discuss their definitions and perspectives with each other. Finally all class comes together to share their definitions. Class discussions may continue around the case studies related to social and environmental justice. Impactful and succinct video clips that show real life examples may help nail down the background of some of those case studies, and improve the awareness of the students. Articles such as those by Dr. Robert D. Bullard, who discusses social

justice issues in his books and articles are among the valuable resources to bring to class. News articles on environmental disasters, such as the oil spill near San Francisco, CA; lead in tap water in Flint, MI, Chicago, IL, and Washington, DC; and the toxic chemical spill due to train derailment in East Palestine, OH can be discussed. Unfortunately, there is no shortage of historic and current environmental disasters and their mishandling by the officials. These incidents can help students understand how underprivileged communities are often impacted more severely than high-income and highly-educated ones (Bullard et al., 2008; Kahl and Hollander, 2010; Karas, 2015; Greenberg, 2016).

### **Providing Practical Skills and Knowledge**

Another way to reinforce EJ, SJ and EE understanding may be achieved through providing practical skills and knowledge to the students with a short project. The students can be assigned a three-tier project utilizing the Environmental Protection Agency's (EPA) Environmental Justice Screening and Mapping Tool. This tool provides a nationally consistent dataset and approach for combining environmental and demographic indicators. Once the students get familiar with the tool they choose a pollution index for a geographic area, and the tool provides demographic and other environmental information for that location. It includes 12 environmental indicators, seven demographic indicators, and 12 EJ indexes. Each EJ index combines demographic indicators with a single environmental indicator. This tool uses color-coded mapping, generating a standard report for a selected area, comparisons for the state, EPA region or the nation, and the ability to download the data. Using this tool to generate a standard report for a selected area can help students understand the complex interplay of environmental and social justice issues. Students

can be asked to synthesize the information they found in a short presentation. It is beneficial to have students present their findings to the whole class as there will be a variety of pollution issues and locations studied. The students then discuss the trends they observe and ethical considerations related to presented cases. The last part of the project is a reflection paper, where the students reflect on all class discussions and formulate their own perceptions and plans for action to handle potential justice and ethical concerns. Reflection questions used are as follows:

1. Were you aware of EJ and SJ happening in the US before the assignment?
2. What did you learn about yourself as you worked on the assignment?
3. What was the most striking thing you became aware of during the in-class presentations?
4. How do you plan to apply your new/improved awareness to your career in the future?

### **Lessons Learned and Plans for Future**

During the implementation of SJ, EJ, and EE discussions in class, several valuable lessons were learned. First and foremost, involving students in the decision-making process related to the activities and extent of the discussions proved to be a crucial factor in creating an inclusive and effective learning environment. This approach not only allowed students to have a say in their own learning but also provided them with a sense of ownership and responsibility towards the success of the module. Refining class norms also played a significant role in establishing a safe space for open and honest discussions. Furthermore, expecting more from students resulted in greater student engagement and more meaningful contributions to class discussions. Students are capable of handling challenging and uncomfortable topics, as long as they are provided with the necessary support and guidance. Many students in their reflection essay indicated that “the most

striking thing they learned in class was how close we all live close to pollution issues that were just being ignored/no action had been taken yet about them and that the absolute worst problems were those in neighborhoods that had one or more factors of lower education, lower gross income, and/or majority population of people of color”. Additionally, open-ended activities were found to be particularly fruitful, allowing for diverse perspectives and creative solutions. Moving forward, it will be important to continue encouraging all instructors to incorporate justice and ethics discussions and activities in all courses for us to educate the future engineers and to create a just and thriving society. Disseminating the lessons learned and coordinating with others can help reinforce the learning outcomes and continue refining the approach for future implementations. Lastly, it is important to continuously evaluate the effectiveness of the activities and make necessary adjustments to ensure that the goals and objectives are being met. For this project, the assignment was bulked into the HW grades initially, however in the latter iterations, the assignment has its own category in the grade distribution. Also for the upcoming iterations of this activity, a survey will be developed and the students will be asked to complete it before and after they complete this assignment. This will help assess the attainment of the learning outcome of creating EJ, SJ, and EE awareness.

## **Conclusion**

In conclusion, infusing SJ, EJ and EE discussions into the classroom is essential for creating responsible, empathetic, and ethical members of society. This process can be challenging, but it is essential in preparing students to be socially and environmentally conscious professionals. By creating awareness, establishing class norms, and providing practical skills and knowledge,



instructors can facilitate meaningful discussions, engage students for a deeper understanding of the complex issues involved in justice and ethics, and equip the students with the tools they need to make informed and ethical decisions in their future careers.

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