Repository Entry - CS20
Embedded EthiCS @ Harvard Teaching Lab

Overview		
Course:	CS 20: Discrete Mathematics for Computer Science	
Course Level:	Lower-level undergraduate	
Course Description:	"Widely applicable mathematical tools for computer science, including topics from logic, set theory, combinatorics, number theory, probability theory, and graph theory. Practice in reasoning formally and proving theorems."	
Module Topic:	Graph Theory & Testimonial Injustice	
Module Author:	Ellie Lasater-Guttmann	
Semesters Taught:	Spring 2022	
Tags:	Graph theory [CS], peripheral nodes [CS], testimonial injustice [phil], epistemic injustice [phil], social structures [phil], testimony [phil], information [CS]	
Module Overview:	Students learn how to model social structures using graphs. Then they learn how information flow can change through those graphs depending on testimonial injustices. Finally, they brainstorm ways to adjust the graphs to limit the impact of testimonial injustice.	
Connection to Course Material:	The module builds directly on the graph theory material taught in the three weeks prior.	This module was particularly successful due to its connection to the course material and its goal to provide technical understanding to phenomena that are already understood colloquially.

Goals		
Module Goals:	- Use graph theory to model social structures - Understand and identify testimonial injustice in social structures - Compare ways to decrease testimonial injustice	
Key Philosophical Questions:	1. How does testimonial injustice cause harm, and how should we mitigate that harm? 2. What is testimonial injustice?	Testimonial injustice caused certain changes in information flow across graphs, making it less likely for nodes to believe

	- What tools does graph theory provide us to understand testimonial injustice? - What are strategies to decrease the harm caused by testimonial injustice? 3. What role did the Me Too movement have on testimonial injustice in social structures?	testimony. That harm can be limited with greater connections in the graph and fewer edges that "disbelieve" the testifier unjustly.

	Materials	
Key Philosophical Concepts:	● Epistemic injustice ○ Testimonial injustice: hearer takes the speaker's word as less reliable due to prejudice ● Social networks ● Power structures	The students already understood these concepts in an informal way, but the philosophical lecture paired with the graph material made that understanding more specific and concrete.
Assigned Readings:	● "Me Too": Epistemic Injustice and the Struggle for Recognition	This reading was central to the final assignment, which expanded the in-class activity to include graphs with multiple testifiers.

	Implementation	
Class Agenda:	1. 15 Minute Lecture: Epistemic Injustice → Testimonial Injustice 2. 30 Minutes: Activity #1 3. 10 Minutes: Universities are groups that are then connected in a network 4. 20 Minutes: Activity #2 (class-wide graph modeling communication between universities)	
Sample Class Activity:	Part 1: Students model two graphs at their table (presented in a handout). One node is a testifier who is trying to share information that is not morally loaded. The person who is listening to their testimony has a certain probability that they will "believe" the person's testimony. They roll dice, which determines whether they believe. All other nodes in the graph have the same probability. They model information flow to see whether the testimony spreads around the full graph. Part 2: Students model three graphs, of the same shape as the two initial graphs but now certain nodes are much less likely to believe the	This module centered on this interactive activity, which was successful. Ending with a class-wide graph is ideal, though it requires careful attention to planning and time management.

	testimony than others (due to testimonial injustice). The first graph has the testifier isolated and generally disbelieved. The second has the testifier less isolated but still disbelieved. The final graph has the testifier less isolated and less disbelieved. The three graphs show the progression of how one could handle testimonial injustice in a social network (while not addressing the injustice itself).	
Module Assignment:	As you read in Jackson's *"Me Too": Epistemic Injustice and the Struggle for Recognition*, The Me-Too Movement involved thousands of women in different industries coming forward with experiences of sexual harassment and assault. This movement became a "consciousness-raising event" where testimony about sexual harassment was taken more seriously than it had been in the past and perpetrators suffered the consequences. Creating a directed graph as an aid in your explanation, what features of the movement contributed to this outcome? Please consider the number of nodes, the number of testifiers, and the number and probability of edges between nodes.	This assignment expanded the graph modeling beyond what was presented in the module itself - now there are multiple testifiers.
Lessons Learned:	1. The material was very closely connected to the course material, and students were engaged. 2. A class-wide graph would have been a compelling way to close the session.	