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# Humanistic Mathematics: An Oxymoron?

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## [PERSPECTIVE]

## Humanistic Mathematics: An Oxymoron?

■ GIZEM KARAALI, assistant professor of mathematics, Pomona College

Mathematics faculty are trained as mathematicians, first and foremost. If we did not experience the soul-expanding possibilities of liberal education during our own undergraduate years, we may hesitate to bridge disciplinary divides when pursuing our core human need to inquire and understand. Although most mathematicians I know are amazing teachers, communicators, and mentors, many still teach the same material that their professors and their professors' professors taught. This time-tested approach can be powerful, fascinating, and even quite entertaining. But it can also seem far removed from the world we inhabit. Yes, we teach "real world applications" of mathematical concepts. Yet our students rarely feel the need to take math outside of the classroom, live with it, and incorporate it into their understanding of life.

After several years of trying to tease humanistic elements into my otherwise standard mathematics classes, I volunteered in Fall 2011 to teach one of Pomona College's first-year seminars. These writing-intensive, discussion-oriented courses require students to read analytically and write experimentally, to critically examine works of art while creating original art of their own. Although I found the seminar format unfamiliar, I was eager for the opportunity to develop a truly interdisciplinary course in humanistic mathematics.

Following my humanist colleagues' example, I chose an intriguing question to guide the semester's activities: Can Zombies Do Math? Clearly, the focus on zombies was strategic: I knew students would be attracted to the bloody stench of the undead. But beneath the

catchy title lay serious course goals. Mathematics is a decidedly human endeavor, requiring a certain comfort with ambiguity balanced with a deep desire to find elegant simplicity in complex patterns. Mathematicians often struggle to convey these ideas to society at large; I wanted to create a course where students, fresh off the factory line that is high-stakes-testing-driven K–12 education, would be exposed to them.

Over the course of the semester, we explored several written texts and movies that spoke to the seminar themes, including the summer reading for first-year students, Kazuo Ishiguro's *Never Let Me Go*. Students reviewed novels, interviewed mathematicians, and wrote about the two serious questions underlying the course title: What does it mean to be human? What is the true nature of mathematics? They also tackled the notions of proof, ambiguity, and generalization through hands-on activities on fractals, tropical geometry, graph theory, and permutation groups. The culminating writing assignment asked students to resolve the puzzle that began the journey: Can zombies do math? In other words, what makes us human, and how does this relate to mathematics?

I hoped that these questions would engage students in inquiry about math as a value-laden system. A mathematical modeling research article on zombie attacks introduced the idea of values in a lighthearted way, but underscored that "possible real-life applications may include allegiance to political parties, or diseases with a dormant infection" (Munz et al. 2010, 146). As the class

engaged with this and other texts, G. H. Hardy's oft-cited quip—"A science is said to be useful if its development tends to accentuate the existing inequalities in the distribution of wealth, or more directly promotes the destruction of human life" ([1940] 2005, 33)—was often in the foreground. We challenged this quote by exploring ethically positive mathematical contributions, including mathematical models of tumor growth and Lily Khadjavi's work on racial profiling in Los Angeles traffic stops (1996). In the process, students confronted ethical ambiguities that arise when using mathematics as a tool.

Throughout the semester, students enthusiastically discussed course themes with roommates, suitemates, and friends who were intrigued by the class. They felt obligated to develop a coherent stance, not only for the sake of their grades, but because they wanted to share an intellectually stimulating experience with their peers and contribute to it as experts. In the end, we reached course goals—including comfort with a certain level of ambiguity and appreciation for the human dimensions of mathematics—while reveling in undead fiction and straightforward mathematical fun. ☐

*Editor's note: For more information about the course described here, see Gizem Karaali's article "In Defense of Frivolous Questions" in the April 10, 2012 issue of Inside Higher Education.*

### REFERENCES

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