Activity

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Story Writing as a Tool for Enhancing Engineering Education

Educator: Charles Robinson, Center for Rehabilitation Engineering, Science & Technology and Biomedical and Rehabilitation Engineering
Context: Out of class; Introduction to Biomedical and Rehabilitation Engineering
Keywords: ethics, storytelling, written reflection
Student Activity Time: 2 -5 hours outside of class

As a way to bring home the advances of biomedical engineering and the neurosciences, as well as to introduce ethical and cost considerations, students reflected on their learning in the class through writing a story about three individuals whose lives were woven together and who underwent a spinal cord injury in a connected manner.

Introducing the Reflection Activity

In an introductory to biomedical and rehabilitation engineering, students learned about biomedical ethics, rehabilitation engineering technologies, and about the fundamentals of neuroscience, with an emphasis on spinal cord injuries, their treatments and costs. As a way to summarize one content unit, students wrote stories about a group of three connected individuals, some upstanding and some far less so, who had undergone three different levels of spinal cord injury (C3 complete, C6 incomplete, and T6 complete) in a related single or series of incidents. The purpose of this reflection activity was for students to personalize class content to the real world.

In the weeks leading up to the storytelling reflection assignment, the educator lectured about and led students through activities related to the technology of and ethics in biomedical and rehabilitation engineering. When the assignment was assigned, the educator provided students with time to brainstorm story ideas in groups of 3 to 4. After this introduction of the assignment and initial in-class brainstorm time, students individually engaged in writing a rich story about the three spinal cord patients. In writing these reflective stories, the educator encouraged students to think back about the course content and their prior experiences. In the assignment description, students were provided with some guidance that included a grading rubric. The story needed to include character development, a good story line, cause of injury, diagnosis, treatment and its ethical allocation, and an estimated cost of long-term care for each of the individuals and who might end up paying.

After students submitted their stories, the educator graded the stories using a three-point scale (rich, good, or fair description and development) for each of the required components of the story. Additionally, the educator, with help from another faculty member and an administrative assistant, determined the "best" story for that class. The student with the "best" story was rewarded with a $25 gift card. This approach incentivized the activity even more.

In terms of outcomes, this storytelling activity tried to get students to integrate their engineering knowledge to a real world situation. It encouraged students to move beyond the technical content of equations and theory to see why this knowledge mattered for real life. After writing the story, students should be able to think about their health experiences from an engineering perspective.

Recreating the Reflection Activity

	Description
1	Introduce various rubrics for allocating biomedical resources
2	Introduce a wide range of assistive technology devices, their design, use, and cost.
3	Introduce the storytelling reflection assignment.
4	Engage students in brainstorming ideas for their storytelling reflection assignment.
5	Grade the students' storytelling reflection assignment.
6	Determine the "best" story and honor that student with a $25 gift card.
7	Discuss with the class what made one or two of the stories stand out.

In the words of the Educator: Tips and Inspiration

Help students connect their learning to the real world. I believe it is important to help students realize the connections of what they are learning in their engineering courses to the real world. In class, I want them to realize that I am not just going to teach them an equation or a design, but how to apply either in relation to the real life. I encourage students to synthesize their engineering and life sciences knowledge to help them better understand medical technology and their health choices. In my teaching, I make this connection by using my own life experiences in the classroom and asking students to draw on their own life experiences.

What was the inspiration for the reflection activity? I started using this reflection activity for many reasons. First, I wanted engineering students to consider a realistic clinical problem, as I had to do throughout my career. Second, I thought it was important for students to engage in an activity where they tie engineering, biological and ethical matters together. Third, I wanted to excite students about the material because I believe they will learn more if they are genuinely enthused about a topic.