Providing Complementary Viewpoints of Healthcare Technology Through An Interdisciplinary Learning Experience

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We describe an interdisciplinary learning experience consisting of interactions with industry personnel, clinicians, and technologists that provides complementary viewpoints of healthcare technology in an introductory biomedical engineering technology course. The goals of this learning experience are to better impart the interdisciplinary nature of healthcare technology, provide a more complete picture of healthcare technology through experiencing different viewpoints, and help students better envision the roles of biomedical engineering technologists in the patient care team through direct interactions with the makers, users, and caretakers of healthcare technology.

At Drexel University, the Biomedical Engineering Technology concentration focuses on the practice of medical equipment operation and support in the clinical environment. A recent addition to the bachelor program in engineering technology, it helps reduce the gap between demand and supply of qualified biomedical engineering technologists. A first course within the concentration, Healthcare Technology is a three credit hours lecture course that is taken in the junior year after completing common core courses for all engineering technology majors. The primary objectives of this 11-week quarter course are to introduce students to the field of healthcare technology and the roles of biomedical engineering technologists in the patient care team. We achieve the first objective by introducing field vocabulary, describing clinical environments, and discussing various medical instruments that technologists support. To achieve the second objective, we develop an interdisciplinary learning experience as follows. After the covering background course materials, students meet with a quality assurance manager from Dräger, a global leader in medical and safety technology. The manager leads the students in discussions about the importance of patient safety and validation in medical equipment design and how feedback from biomedical engineering technologists and clinicians contribute to this. Students then visit Drexel University's Center for Interdisciplinary Clinical Simulation and Practice (CICSP), where nurses immerse the students in patient care environments through simulations of clinician's office, intensive care unit, and operating room using the center's state-of-the-art Simulation Lab. The nurses discuss with students the role of healthcare technology for patient care and how improperly working devices or equipment negatively impact the clinicians' ability to provide high quality patient care. Last, the students visit the Children's Hospital of Philadelphia and meet with a biomedical engineering technologist. The technologist discusses the challenges and satisfaction that come from supporting critical patient care technology and then leads students through hands-on exercises using the hospital's infusion pumps. These exercises emphasize the need for technologists to understand the equipment's operations, errors, and potential issues and damages that comes with demanding clinical use.