

IMPLEMENTING CASE BASED LEARNING IN BIOENGINEERING COURSEWORK

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MOTIVATION

Case studies are a classic method of teaching in many disciplines and are often used to teach students the practical application of course material. Engineering case studies tend to have a narrow focus around a core technical concept, often a design failure. In our Bringing Biomedical Devices to Market course we aim to provide students with a case based learning experience that encompasses not only the biological and technical aspects of a medical device, but develops student understanding of the interdependent forces of technical, marketing, regulatory, and user priorities that ultimately determine the success of a medical device.

EARLY DEVELOPMENT

2014 - YEAR 1

Goal:

Present a medical device case illustrating a class concept

Format:

Instructor lecture with powerpoint visuals and data
Total: 20 minutes of class time

Assessment:

Similar to standard engineering case studies. Needed more depth and breadth to emphasize course concepts.

2015 - YEAR 2

Goal:

Students apply course concepts to a problem and propose possible solutions around a medical device case.

Format:



Assessment:

Students applied course concepts well and grasped the complexity but didn't have the knowledge and structure to have a meaningful discussion.

2016 - CURRENT GOALS

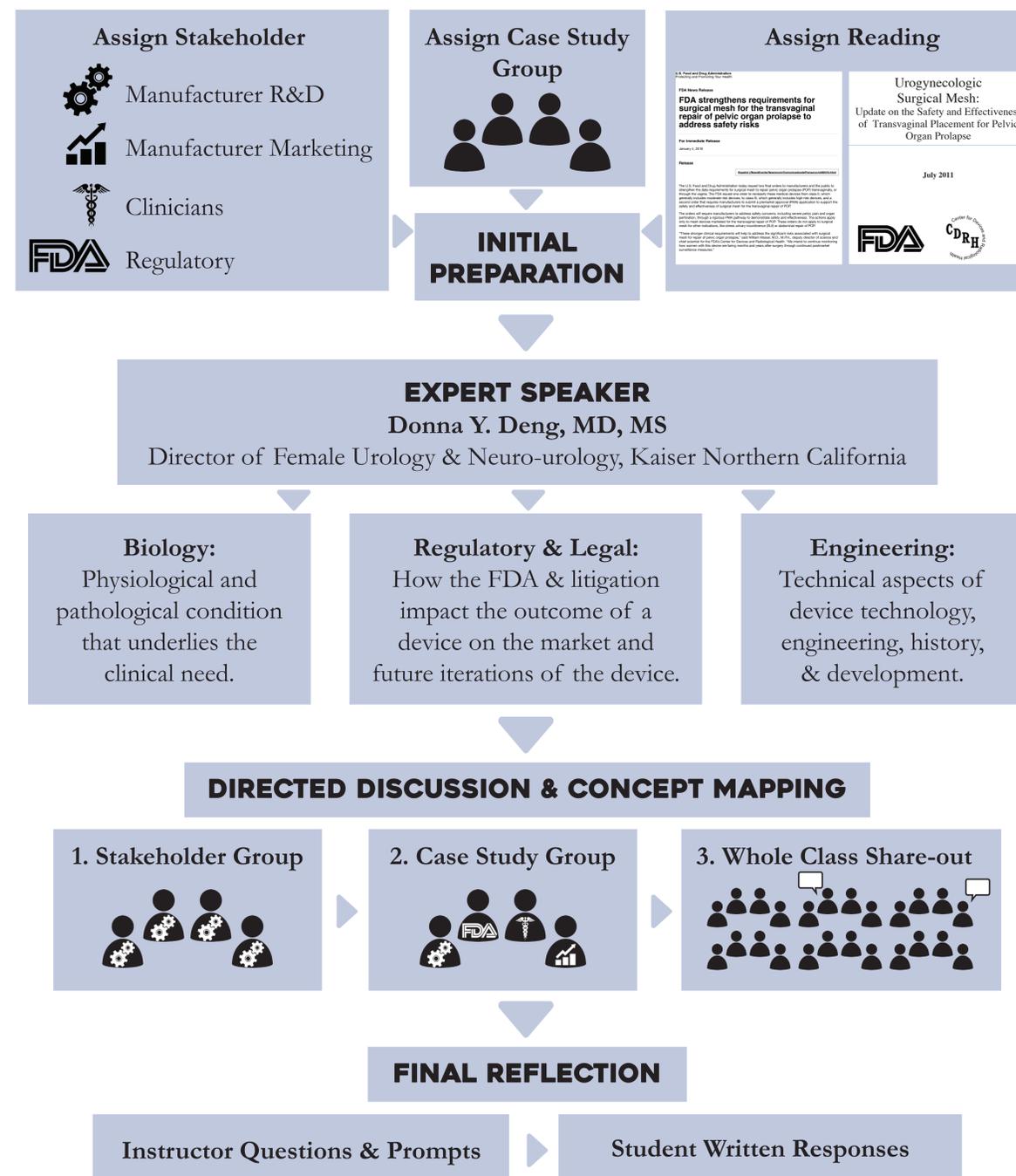
Students will develop their understanding of the complex issues surrounding the development of medical devices in three key areas:

BIOLOGY

ENGINEERING

ETHICS

SAMPLE FORMAT - VAGINAL MESH



ASSESSMENT

92%

students had little to no prior knowledge about pelvic prolapse and vaginal mesh prior to the case study.

80%

students said their perspective on vaginal mesh changed or evolved over the course of the case study.

96%

students agreed Dr. Deng's talk was valuable and useful for their understanding of the case study.

48%

students cited the complexity or tension between stakeholders as contributing to the vaginal mesh 'mess'.

ONGOING WORK

- (1) Assessment and updates to existing case studies as the device landscape evolves.
- (2) Development of new case studies.

CASESTUDIESFORSTEM.COM



- This (in-progress) website includes resources on
- (1) why case based learning is a useful and effective teaching tool
 - (2) describes how we integrate case studies in the classroom & includes guidelines for creating your own case studies
 - (3) links to case study databases from various disciplines

ACKNOWLEDGEMENTS

A huge thank you to the UC Berkeley Bioengineering Department, especially Nikki Humphries & Dan Fletcher for sponsoring my travel to this conference. Thank you to the UC Berkeley Center for Teaching and Learning Lecturer Teaching Fellows Program, which provided a mentorship community for this project.