

Using Twitter to Support Students' Design Thinking

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Abstract

The goal of the short-term study abroad course “International Perspectives on Biomedical Engineering Design” is to enable students to consider sociotechnical factors in designing clinically translatable solutions. In addition, comparison of healthcare systems in Europe and the United States enables students to see the impact of culture on healthcare because people in these locations have similar medical resources. Students seek to define an actionable problem statement that summarizes the needs and insights identified through interviews with healthcare professionals. Methods recommended for formulating actionable problem statements include creating a Madlib or want ad. However, such approaches did not resonate with our student group. In this presentation, we describe our experiences using Twitter as a method for students to succinctly write actionable problem statements that spur creative problem solving.

1. Course Description

The goal of the course International Perspectives on Biomedical Engineering Design at The University of Texas at Austin (UT Austin) is to enable students to consider sociotechnical factors in designing clinically translatable solutions. Students learn human-centered design methods to understand the people for whom they are designing and to identify actionable problem statements.

In 2017, the course was offered in a “Maymester” format. A Maymester is a faculty-led study abroad program in which a group of UT Austin students take a course abroad taught by a UT faculty member. Maymesters are four-week, 3-credit courses that take place from late May to mid-June.

The 2017 course offering focused on the design of health information systems for supporting medical decision-making. Students explored the impact of culture on healthcare delivery and design of healthcare technologies through comparisons of Europe and the United States. The

class was hosted at Faculdade de Engenharia da Universidade do Porto.

2. Instructional Challenge

In the course International Perspectives on Biomedical Engineering Design, students plan, conduct, and interpret interviews with healthcare professionals from both Europe and the United States (via videoconferencing). They plan semi-structured interviews using techniques from human-centered design and readings on topics such as the development of medical expertise, types of cognitive bias, and clinical decision-support systems. Through individual reflection and class discussion of the interviews with healthcare professionals, the students identify actionable problem statements pertinent to health information technologies.

The course utilizes The Bootcamp Bootleg, a design thinking toolkit provided to the community by the Stanford d.school [1]. In the define mode of Stanford’s design process, the goal is to generate an actionable problem statement, also called a Point of View, that summarizes the needs of specific users and insights identified using empathize mode methods such as interviewing for empathy. The Bootcamp Bootleg suggests several methods for formulating actionable problem statements including creating a Madlib or want ad. Unfortunately, none of the suggested methods for formulating actionable problem statements resonated with our student group in 2017.

For example, after conducting interviews with two orthodontists, one from the United States and one from Greece, the students were asked to generate actionable problem statements using methods from The Bootcamp Bootleg. As shown by the examples in the left column of Figure 1, the students’ efforts typically yielded statements that were unlikely to spark enthusiasm and cultivate ideation of possible solutions.

3. Proposed Use of Twitter

Since our 2017 cohort of students did not effectively use methods such as creating a Madlib to generate actionable problem statements, we explored another approach using Twitter. We challenged the students to write tweets that summarized problems and insights that they learned from the interviews with healthcare professionals. (Find us on Twitter at [@PovPractice](#).) We hypothesized that the familiar casual format would help the students succinctly capture the emotional insights revealed through the interviews.

The students' attempts to generate actionable problem statements as tweets were more provocative and darkly humorous than their prior efforts had been (right vs. left columns of Figure 1). The edgy pop culture phrasing typical of tweets retained the students' surprise when the interviews revealed unexpected aspects of the professionals' experiences in healthcare. For example, contrast "An orthodontist needs to possess interpersonal skills in order to develop more meaningful relationships with patients" and "Dr. João needs to emotionally express himself and let the walls come down because the patient wants him to DTR."

As they gained experience conducting interviews and writing actionable problem statements as tweets, the students began incorporating more images into their tweets (Figure 2). Their increasingly visual tweets used pop culture icons like Oprah Winfrey and Overly Attached Girlfriend to quickly and humorously convey ideas.

4. Summary

The impact of social media writing habits on education is often assumed to be negative. In contrast, we share an example of how the technical constraints and social conventions of a social media platform (Twitter) may help students express ideas with greater focus and higher emotional content.

An actionable problem statement should frame a problem in a way that inspires and intrigues. Our experience suggests that Twitter may be a useful tool in helping students generate actionable problem statements.

Acknowledgement

We thank the International Engineering Education office at The University of Texas at Austin for the opportunity to teach International Perspectives on Biomedical Engineering Design in the Maymester format. We deeply appreciate the support of our hosts at Faculdade de Engenharia da Universidade do Porto. We are indebted to the healthcare professionals who graciously volunteered their time to be interviewed by our students.

References

[1] <https://dschool.stanford.edu/resources/the-bootcamp-bootleg>

Greece needs to shift dental assistants towards a more active role because it makes it more efficient and helps the shortage of orthodontists in Greece.

Dr. Da Silveira needs to have a diverse and collaborative team while working with craniofacial syndromes because the team provides many perspectives and support for decisions.

An orthodontist needs to possess interpersonal skills in order to develop more meaningful relationships with patients.

Greece needs to promote the orthodontist profession because the low ortho-patient ratio can have a negative effect on the health of the society.

Patients need to be provided with enough information because engaged and motivated patients adhere more to healthy habits and treatment ~~proct~~ procedures.

Orthodontists need to promote taking an active role in their health to their patients because the onset of systemic diseases are connected to oral health.

Orthodontists need to have more access to the latest technology because improved interfaces that acquire virtual representations of a patient's mouth could lead to more accurate and faster treatment plans.

Healthcare professionals need to combine adequate emotional support with quality treatment because of the emotional aspect of body image.

The public needs to be better educated on the importance of oral health because the general public is unaware of the relationship between oral health and systemic diseases.

A orthodontist needs to be firm with their treatment plans with patients because they will regret if they compromise with the patient.

POV Practice @PovPractice · 7 Jun 2017
Dr. Guero needs an army of heroic dental assistant to rise up because he cannot fight plaque alone

POV Practice @PovPractice · 7 Jun 2017
Dr D needs to have an avenger-like team in order to successfully vanquish the craniofacial pandemic

POV Practice @PovPractice · 7 Jun 2017
Dr. João needs to emotionally express himself and let the walls come down because the patient wants him to DTR.

POV Practice @PovPractice · 7 Jun 2017
John Stamos needs more dentists in Greece because he doesn't want his family's teeth to fall out

POV Practice @PovPractice · 7 Jun 2017
Doctors keep talking and patients keep pretending to listen

POV Practice @PovPractice · 7 Jun 2017
João needs to take an active role in his health or he'll get encephalitis! #🦠

POV Practice @PovPractice · 7 Jun 2017
Hospitals want their patients to cry, refusing to give orthodontists 3D scanners.

POV Practice @PovPractice · 7 Jun 2017
Kids are being bullied because surgeons are making them ugly! #sad

POV Practice @PovPractice · 7 Jun 2017
Did you know that if you don't take care of your oral health that you could die of severe diseases? #notfakeneWS

POV Practice @PovPractice · 7 Jun 2017
Dr. João needs to be firm with his treatment plans because he will regret compromising with his patients.

Figure 1. Examples of students' efforts to generate actionable problem statements before (left column) and after (right column) they were advised to do so using Twitter. The students' tweets usually demonstrated better focus on specific users, needs, and insights relative to their initial attempts to generate actionable problem statements.

POV Practice @PovPractice · 12 Jun 2017
Dermatology needs psychology because they are interconnected through an indestructible bond. #POVdem #relationshipgoals



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POV Practice @PovPractice · 20 Jun 2017
Radiation oncologists: We have too much data. We dont even know what to do with it...
Technology:
#POVradon



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Figure 2. As the students gained experience interviewing healthcare professionals and generating actionable problem statements as tweets, they more frequently incorporated images.