

Author's Commentary and Notes for Instructors (Boeing Max 737 Crisis)

Commentary On

Learning and Moving forward from the Boeing Max 737 Crisis

Role-play Instructions

1. Each student is assigned a role a week before the discussion.
2. Students assigned to the role of Brad Jorgensen and/or Kathy Schmidt serve as the moderator and lead the conversation based on the script below.
3. The script provided below is there to guide the discussion, but you should leave room for the conversation to flow naturally and allow everyone to contribute.

Role-play Script (for Brad/Kathy)

1. What role are you playing in the role-play group discussion? Please state the name, title, and describe the role in your own words (couple of sentences).
[to be answered by each group members individually and in a sequence]
2. From the perspective of your role, how would you respond to Brad and Kathy's question about why the disaster happened and how it could have been prevented?
[to be answered by each group members individually and in a sequence]
3. From the perspective of your role, what is your response to Brad and Kathy's question about how can we ensure future safety and transparency and rebuild trust? Why do you think the approach you suggest is the best approach? What do you think are the main barriers to this approach?
[to be answered by each group members individually and in a sequence]
4. What is your overall group recommendation to Brad/Kathy?
[open discussion, anyone can chime in]

One way to ensure students are prepared for the discussion is to assign a few questions from the script as a pre-discussion assignment (short answers). Similarly, to ensure students reflect on the discussion, they can be assigned the last question from the script as a post-discussion exercise. They can also be asked specifically about ethical concepts or concerns related to safety and transparency.

Ethical Codes and Guidelines

Several different ethical codes or guidelines can be provided to students to prepare for the discussion or to reflect upon during their discussion depending on the students' disciplinary composition. For instance, for implementation in a computing or technology related course ACM and IEEE guidelines can be more informative and the discussion can be centered largely on the MACS software (how did the algorithm work, why was it implemented, who designed it, why were the pilots not informed about it, etc.).

American Institute of Aeronautics and Astronautics code of ethics:

<https://www.aiaa.org/about/Governance/Code-of-Ethics>

Airline pilots' association code of ethics:

<https://www.alpa.org/en/about-alpa/what-we-do/code-of-ethics>

FAA Ethics of Maintenance:

<https://www.faa.gov/files/gslac/courses/content/718/2173/HF%20Chapter%2011.pdf>

ACM Code of Ethics:

<https://www.acm.org/code-of-ethics>

IEEE Code of Ethics:

<https://www.ieee.org/about/corporate/governance/p7-8.html>

National Society of Professional Engineers code of ethics:

<https://www.nspe.org/sites/default/files/resources/pdfs/Ethics/CodeofEthics/NSPECodeofEthics>

Background Readings and Resources

One of the goals of this exercise is to motivate students to undertake their own research on the topic to prepare for the role they are playing. But it is important to provide them with preliminary material to start their own research.

Videos

Wall Street Journal report “How Boeing Rocked the Aviation Industry”:
<https://www.youtube.com/watch?v=0jTN0JD4I5M&feature=youtu.be>

Vox’s “The real reason Boeing’s new plane crashed twice”:
<https://youtu.be/H2tuKiiznsY>

Bloomberg’s “How Boeing Lost Its Way”:
<https://www.youtube.com/watch?v=EESYomdoeCs>

Readings

Johnston, P., & Harris, R. (2019). The Boeing 737 MAX saga: lessons for software organizations. *Software Quality Professional*, 21(3), 4-12.

Herkert, J., Borenstein, J., & Miller, K. (2020). The Boeing 737 MAX: Lessons for engineering ethics. *Science and engineering ethics*, 26, 2957-2974.

Travis, G. (2019). How the Boeing 737 Max disaster looks to a software developer. *IEEE Spectrum*, 18.

A Rebuttal to Travis’ article from ACM Risks Digest:
<https://catless.ncl.ac.uk/Risks/31/21#subj20>

Official information provided by Boeing:
<https://www.boeing.com/commercial/737max/737-max-software-updates.page>

Seattle Times Coverage:
<https://www.seattletimes.com/business/boeing-737-max-crisis-2019-news-coverage/>

The New Yorker (in collaboration with ProPublica):
MacGillis, A. (2019). The Case Against Boeing.
<https://www.newyorker.com/magazine/2019/11/18/the-case-against-boeing>

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