Engineering Instructors' Solutions To Challenges While Remote Teaching

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Background

- The COVID-19 pandemic abruptly ended in-person teaching at universities around the world.
- The unique change from in-person to emergency remote teaching (ERT) allowed for study on how instructors handled challenges in terms of their teaching practices.

Research Question:

How do instructors solve the challenges they were experiencing while in ERT during the COVID-19 pandemic?

Methods

- In Spring 2020, weekly surveys were sent to engineering faculty during the last seven weeks of the semester from April to May.
- The first survey was sent in week 12.
- The survey had multiple choice and open-ended questions that were thematically analyzed.
- Period 1: Week 12 & 13 Period 2: Week 14 & 15 Period 3: Week 16 & Finals Week
- Survey question deductively analyzed:

  How do you plan to address the teaching challenge you described?

Demographics

Faculty by Department (n = 39)	
Department	Percent
Civil and Environmental Engineering	23
Computer Science and Engineering	18
Mechanical and Materials Engineering	18
Biological Systems Engineering	18
Architectural and Construction Engineering	13
Other	10

Gender: Male = 74.4%   Female = 25.6%

Results

|	Code	Definition	Example
Challenges	Engagement	Student participation/interaction/attendance in class, with lectures, video, office hours, or with the instructor.	"Difficult to assess student engagement"
	Assessments	Pertains to the mention of quizzes or exams including anticipation, planning, design, and administration. This excludes the students' submission of the exams.	"I'm still not sure about how to conduct the final exam, such as which format and how to monitor students, etc."
Solutions	Assessment Format Change	A new format or change of assessments. Excludes new assignments.	"I decided to use Canvas for the final exam."
	Student Outreach	Instructors attempting to engage students by emails, announcements, office hours, or zoom meetings.	"Tried to do one on one zoom calls."
	Course Planning Change	A change in the course design or content delivery for the course.	"We will teach until the very end of the semester. Often I used the last one or two classes for other fun activities."
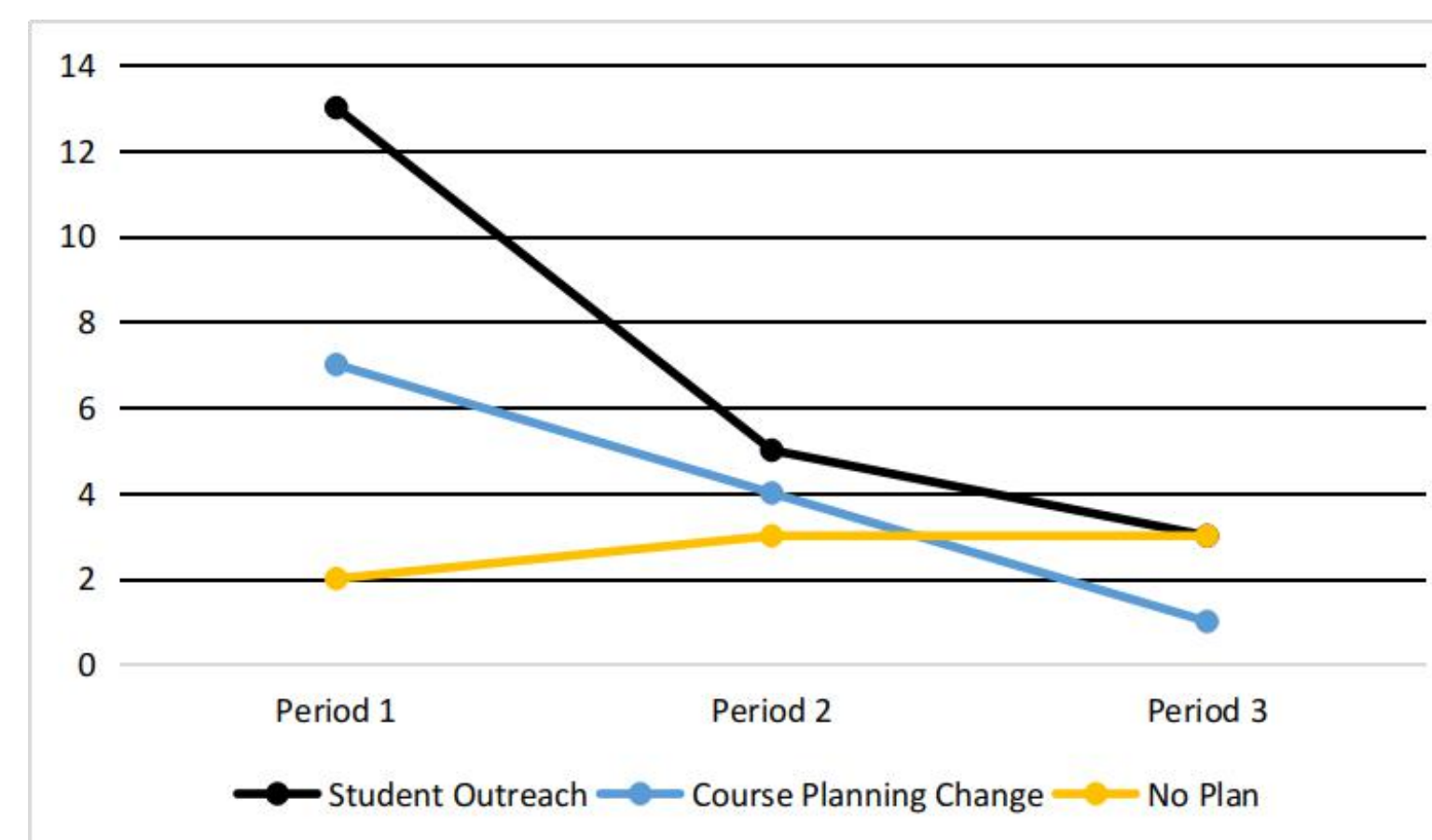
Figure 1: Top Solutions to Engagement
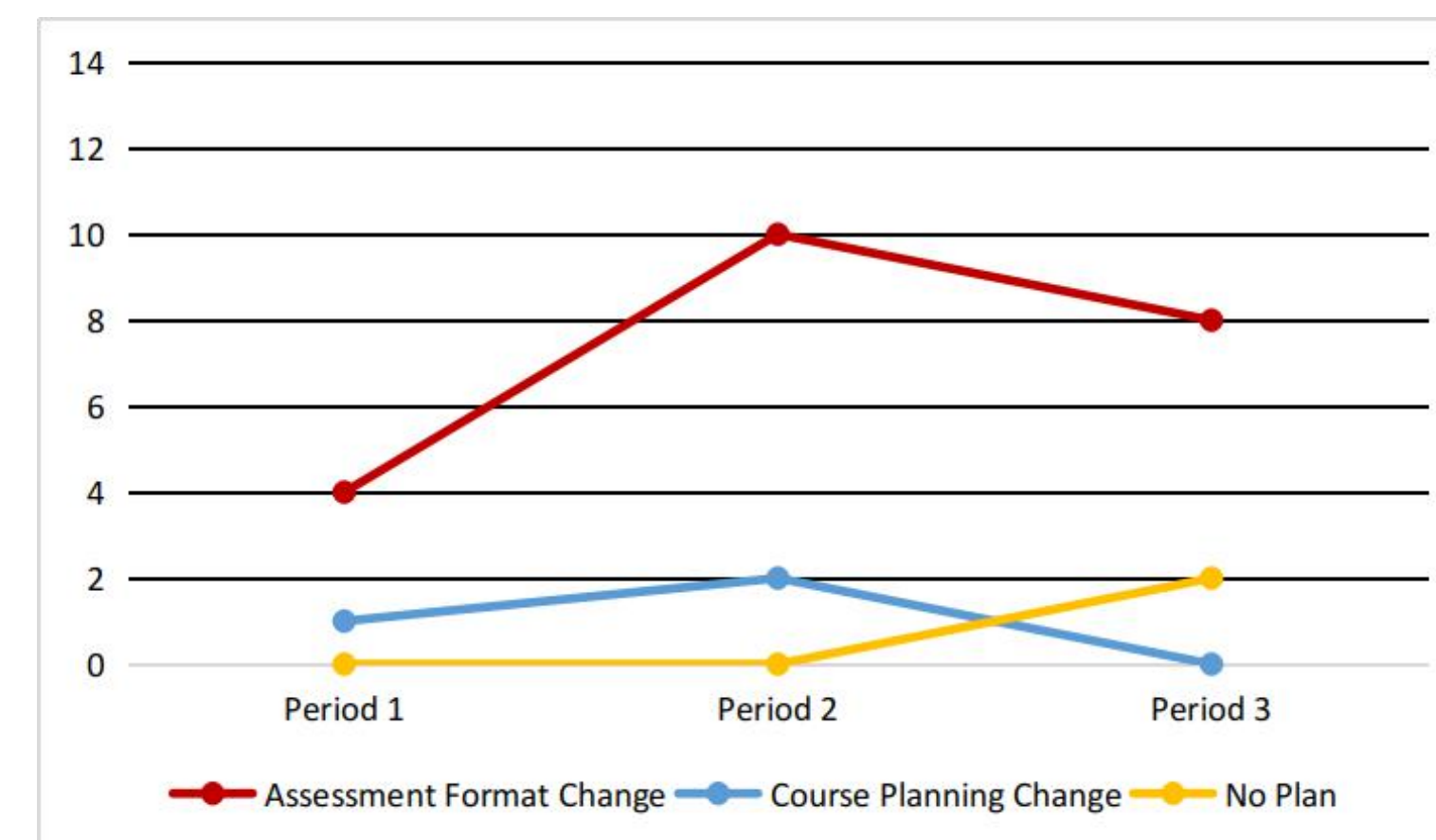
Figure 2: Top Solutions to Assessments

Key Findings

- One prominent solution to students not engaging was instructors having individual meetings with the students.

- Instructors that did not feel engagement from their students tried to directly engage with the students by asking for their responses on issues/topics.

- One of the top concerns for instructors was academic dishonesty and being unable to control that in a remote setting.

  - Instructors opted for open-book, open-notes exams.

  - Some tried to keep the traditional format with adjustments to an online environment (e.g., use of question banks)

Future Work

- Fall and Spring 2021 data will be analyzed to get more insight into instructors' solutions to challenges.

- Analyzing Instructor successes and challenges for Fall and Spring 2021 will also be valuable to understand how instructors reacted to emergency remote teaching.

Acknowledgements