Students' Evaluation Toward Online Teaching Strategies for Engineering Courses during COVID

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Extended Abstract

As a result of the COVID-19 pandemic, courses at various educational institutions were suddenly migrated online in the Spring 2020 semester. For many of the instructors, this was their first experience teaching engineering courses virtually. Instructors applied a range of online teaching strategies to assist students in learning better. The purpose of this study was to gather student feedback on different teaching methods and uncover whether or not these approaches were used or were found to be supportive by the students. Our findings can benefit instructors of engineering courses in improving or changing their teaching methods in order to enable students to adjust to remote learning better.

The research team administered surveys during the final two weeks in the semester of Spring 2020. One hundred nineteen participants answered a series of closed questions related to the instructors' teaching strategies across 8 different engineering courses (Table 1). Specifically, based on the question "*What things did your instructor do that was helpful for learning online,*" participants assessed whether instructors' teaching strategies were helpful or not. The criteria for evaluation were *Not Helpful, Slightly Helpful, Somewhat Helpful, Helpful, Very Helpful,* and *N/A*. *N/A* means the instructor did not use this strategy.

Table 1: Frequency of Student Responses to Survey Questions

No.	Instructors Instruction Strategies	Participants' Responses Frequency (f)						
		Not Helpful	Slightly Helpful	Somewhat Helpful	Helpful	Very Helpful	N/A	Row Total
1	Provided feedback and/or answer questions in timely manner	3	4	16	39	38	18	118
2	Lectures delivered via recorded videos	1	3	18	32	46	16	116
3	Interactive synchronous class sessions delivered via video conferencing	2	8	17	42	32	17	118
4	Provided additional/alternative sources for class information	9	3	7	24	24	51	118

No.	Instructors Instruction Strategies	Participants' Responses Frequency (f)						
		Not Helpful	Slightly Helpful	Somewhat Helpful	Helpful	Very Helpful	N/A	Row Total
5	Provided opportunities for student group interaction via breakout rooms or separate video conferencing	6	7	10	27	29	39	118
6	Discussion forums used the learning management system Canvas	1	9	11	34	54	9	118
7	Provided flexible deadlines	2	5	10	39	59	2	117
8	Provided clear expectations in assignments	5	4	13	38	51	6	117
9	Instructor messaged to students (via pre-recorded video, or text announcements or postings to discussion forums)	5	4	11	32	30	36	118
10	Used of other technology tools such as voice thread or interactive online labs to enhance instruction and learning	0	0	2	6	8	58	74
	Column Total	34	47	115	313	371	252	1132

Overall, participants generally indicated the instructors' teaching strategies to be very helpful ($f = 371$) or helpful ($f = 313$). A high number of N/A responses occurred for the categories of No. 4, 5, 9, and 10. This high number indicates that the strategies were not used extensively by the instructors of the courses. Among the strategies that had the highest very helpful responses, strategies No. 6,7, and 8 indicated that students appreciated discussion forums, flexible deadlines, and clear expectations. Strategies 4 and 5 had a higher number of not helpful responses indicating that the strategies of alternative resources and breakout rooms needed improvement. The conference presentation will breakdown the results to look at the responses in the individual classes and we as the faculty reflection on what they did (or tried to do) during the transition to online learning. In addition, the results will be put into context with other elements of the survey evaluating student self-efficacy and outcome expectations.

Our findings suggested that teaching strategies made students feel supported and indicated that discussion forums, flexible deadlines, and clear expectations were among the helpful.

Keywords

student paper, Engineering Education, Online Teaching, Teaching strategies, COIVD

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