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### Improving Active Learning through Advanced Teaching Practices on an Online Course

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# Improving Active Learning through Advanced Teaching Practices on an Online Course

Jin Ouk Choi, Civil and Environmental Engineering and Construction

## Teaching Practice & Need it Addresses

**Teaching Practice:** This semester, implemented multiple new teaching techniques and strategies in the CEM453-653 course in Fall 2021, which was delivered online. The specific teaching practices and technologies are:

- 1) Delivering lectures both live (synchronous) and recordings (asynchronous)
- 2) Using adaptive technology (Mentimeter, WebEx Poll) with real-time feedback
- 3) Using real-world examples and problems
- 4) Using an advanced teaching gadget (graphics drawing table) for interactive teaching
- 5) Diversifying Instructional Techniques (in-class exercises, homework assignments, poll questions)

**Need:** Since the outbreak of the COVID, there has been a great need to improve and advance learning experiences and opportunities for students when the courses are taught remotely.

## Evidence it Benefits Students (1)

- After the midterm exam, the students' performance was assessed. Compared to the previous year, the average of students' scores has increased 3.6 percent (N = 27 students).
- A voluntary mid-semester survey was conducted to collect students' opinions. 26 out of 27 students completed the survey. The results showed that:
- Students preferred
  - the lectures to be delivered both live and lecture recordings <u>(62%)</u>
  - the problem-solving solutions to be delivered by both handwriting and ppt animation (88%)
- Students agreed
  - the real-time word-cloud creating app (Mentimeter) helped them <u>engage (65 %);</u>
  - the WebEx poll questions provided real-time feedback (92 %), and helped them learn more (89 %) and engage more (92 %);
  - the graphics drawing tablet helped them to read and learn better (92 %);
  - in-class exercise (96 %); and homework assignments helped them learn (96%);
- This year (Fall 2021)'s CEM453-653 teaching evaluation score (4.70) <u>outperformed</u> past five years (2016-2020) average CEM453-653 score (4.26)

## Evidence it Benefits Students (2)

l prefer		
live lectures (synchronous) only	8 %	$\sim$
lecture recordings (asynchronous) only	19 %	
Both live lectures (synchronous) and lecture recordings (asynchronous)	62 <sup>%</sup>	
No preference	12 %	

Dene	Ш
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	No

oviding lecture recordings (asynchronous) helped me learn.			
Strongly Disagree	4 %	$\sim$	
Disagree	0 %		
Somewhat Disagree	0 %		

Neither Disagree or Agree	0 %	
Somewhat Agree	4 %	
Agree	27 %	ł
Strongly Agree	62 %	
No opinion	4 %	

### The WebEx poll questions helped me learn.

Strongly Disagree	4 %	$\sim$
Disagree	0 %	
Somewhat Disagree	4 %	
Neither Disagree or Agree	4 %	
Somewhat Agree	12 %	
Agree	42 %	
Strongly Agree	35 %	
No opinion	0 %	1

### The WebEx poll questions provided real-time feedback.

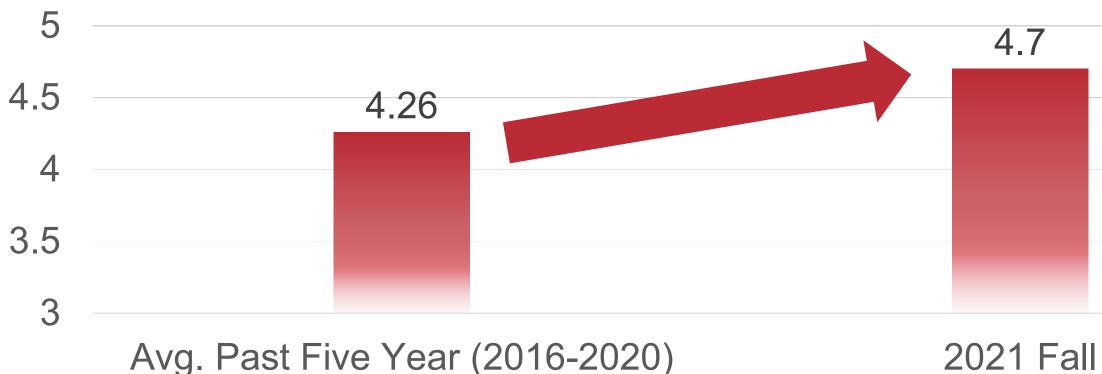
Strongly Disagree	4 %	$\sim$
Disagree	0 %	1
Somewhat Disagree	4 %	
Neither Disagree or Agree	0 %	
Somewhat Agree	8 %	
Agree	31 %	
Strongly Agree	54 %	
No opinion	0 %	1

### The graphics drawing tablet helped me to read and learn.



Strongly Disagree	0 %	$\sim$	Stro
Disagree	0 %	i i i i i i i i i i i i i i i i i i i	Disa
Somewhat Disagree	0 %	i	Som
Neither Disagree or Agree	8 %		Neit
Somewhat Agree	15 %		Som
Agree	38 %		Agre
Strongly Agree	38 %		Stro
No opinion	0 %		No c
		-	

### **CEM 453-653 TEACHING EVALUATIONS**



efer Dr. Choi's problem-so	olving	
h handwriting (only)	0 %	$\checkmark$
h PowerPoint animation (only)	4 %	
h both handwriting and ppt mation	88 %	
preference	8 %	

Dr. Choi explains new concepts/problems using real-world examples 0 % 🗸 **Strongly Disagree** 

mewhat Disagree	0 %	
either Disagree or Agree	4 %	
mewhat Agree	38 %	
ree	35 %	
ongly Agree	23 %	
opinion	0 %	

### The WebEx poll questions helped me engage.

ongly Disagree	4 %	$\sim$
sagree	4 %	
mewhat Disagree	0 %	
ither Disagree or Agree	0 %	
mewhat Agree	15 %	
ree	35 %	
ongly Agree	42 %	
opinion	0 %	

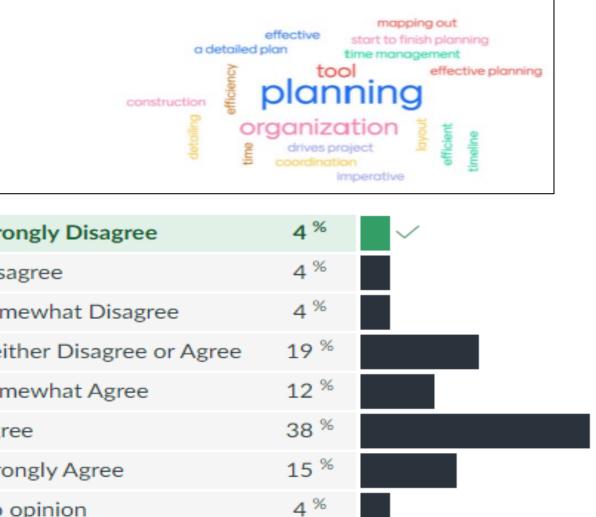
I like the WebEx poll questions and like to see more poll questions.

ongly Disagree	8 %	
agree	0 %	
mewhat Disagree	0 %	
ither Disagree or Agree	15 %	
mewhat Agree	12 %	
ree	35 %	
ongly Agree	27 %	
opinion	4 %	



### Mentimeter, a real-time word cloud creating app, helped me engage.

What is Construction Scheduling?



## How Others Can Adopt This Practice

- adopting these technologies and practices.
- courses.

## **Resources & Where to Find Them**

### Use Real-World Examples

- 316180004081>
- (Tate, 1995)) Available at <https://unlvprimo.hosted.exlibrisgroup.com/primoarch\_scope=EVERYTHING&tab=default\_tab&lang=en\_US&context=PC
- 2018), p. 10 and p. 11). Available at <
- https://unlvmary\_1476636>
- https://www.mentimeter.com/>
- https://www.xp-pen.com/>

- program AY2020-2021

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• The strategies and free online sources are shared (see below).

Other instructors will find their values from this poster and consider

Even though the new teaching gadget and strategies were implemented to the course that is delivered only remotely, these gadgets and strategies can be adapted to both in-person and online

(Gay, 2018), p. 169. Available at <https://unlvprimo.hosted.exlibrisgroup.com/permalink/f/ovttgp/01UNLV\_ALMA21291

explore/fulldisplay?docid=TN\_cdi\_jstor\_primary\_1476636&vid=UNLV&se

Use Adaptive Technology with Real-Time Feedback (Bergey et al., https://files.eric.ed.gov/fulltext/ED585543.pdf>

Problem-Based Learning (Tate, 1995), p. 170. Available at <

primo.hosted.exlibrisgroup.com/permalink/f/6tvje6/TN\_cdi\_jstor\_pri

The real-time word-cloud creating app (Mentimeter). Available at <

The graphics drawing tablet (XP-Pen Deco 01 V2). Available at <

## Acknowledgements

Dr. Choi incorporated the teaching strategies learned from the Culturally Relevant & Responsive Teaching (CRRT) fellows

(https://sites.google.com/unlv.edu/transcend/components/culture?a) uthuser=0) supported by the NSF TRANSCEnD project.

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