

Do Class Size Matter in Online Learning Settings?

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Introduction

- Online learning continue to shapes the modern day education
- More and more courses are offered online or using distance education modules
- Educators quick to embrace the technological developments
- For educators online learning modules have enhanced resources availability and for students improved flexibility and variety for learning.

- Improve student achievement and learning outcomes
- Do and can technology improve learning outcomes?
- Results are mixed but more favorable towards it is not.
- Application of technology in education is a push factor rather than pull factor.

- Online learning methods are widely used and accepted in Europe and North America
- Technology adoption is less in developing countries and middle-eastern countries.
- Kuwait government does not approve and accept online degrees.
- Academic institutions are adopting technology with limited application

Literature Review

- Teacher student interaction is a very important component in any educational environment.
- Students performance are affected by degree and manner of faculty-student interaction (Simmons, 1991; Ritchie and Newby, 1989)
- Apart from interaction, instructor's experience and comfort teaching online, the qualities of technology employed, and the nature and experience of students enrolled in the course (Arzt, 2011)

- In the instructors point of view desirable number of students per class was 19 and 16 to be ideal.
- The interaction could be electronic mail for face-to-face student advisement; and, student posts and online chats to augment traditional assessment (Tomei, 2004)
- Tomei (2004) found that compared to class size of 11 students in a traditional classroom, the instructor spends 14 percent more time in online classroom

- For interaction based quality learning, ideal class size for traditional classroom is 17 and online classroom is 12 (Tomei, 2004).
- However, Orellana (2006) reported that higher interaction does not necessarily ensure higher learning
- DiBiase (2004) longitudinal study for 3.5 years with regards to online learning and class size suggest that there is negligible negative impact of class size on student satisfaction.

- In a more recent study, Bettinger (et al., 2015) found that online classes with an average of 30 students, increasing the class size ten percent does not significantly affect student grades, enrollment in the next term, or credits attempted the next term.
- Mupinga and Maughan's (2008) found that there is inconsistency across the institutions on online class size and faculty time devoted to teach those classes

- Literature on online learning outcome contradicts conventional wisdom where large classes facilitate equal learning opportunity
- From the point of view of instructor and the student there is a significant difference what constitute an ideal class size.
- Many of the studies have used multiple instructors, which likely to result bias estimates

Objective

- Examine the effect of class size on student performance in an online learning setting.

Methodology

- Used the data from Fall 2007 to Spring 2014 in principle of microeconomics classes.
- In large and small classes (regular classroom setting) groups of students were subjected online assignments while other group did not have any assignments
- Online assignments were administered by Aplia (Cengage Learning) where the instructor can assign any number of assignments.

- Prior and post knowledge of microeconomics was determined using standard test TUCE (Test of Understanding College Economics).
- Student learning was assessed using TUCE score.
- TUCE scores were compared across the class size and online learning.

$$\text{Final} = \alpha + \beta_1 \text{GPA} + \beta_2 \text{Gender} + \beta_3 \text{Online} + \beta_4 \text{Size} + \beta_5 \text{Scholarship} + \beta_6 \text{ECH}$$

Results

- Mean TUCE scores:
 - larger class 12.93
 - smaller class 12.35
 - difference was significant at 10%
- No difference in TUCE scores between male and female
- Mean TUCE scores:
 - online learning 12.45 and no online learning 13.00
 - Difference was significant at 10%

- Mean TUCE scores:
 - no scholarship 13.1
 - scholarship 12.1
 - difference was significant at 5%
- No difference in TUCE scores between male and female
- Mean TUCE scores:
 - online learning 12.45 and no online learning 13.00
 - Difference was significant at 10%

For all students

Variable	Coefficient	T-values	Significance
Intercept	3.14917	2.88	1%
GPA	3.33909	12.27	1%
Gender	0.20642	0.71	
ApliaDum	-0.85864	-2.95	1%
Size	0.93066	3.19	1%
Scholarship	-1.07897	-3.76	1%
ECH	0.00467	0.76	

- Students GPA had a significant impact on final exam scores
- One point more GPA students performance is 25% more to lesser GPA student
- Online learning had a significant negative impact on final exam scores
- An online learning students score is 7.2% less compared to no online learning student

- Larger class size students final exam scores were 7.8% more than smaller class size student score
- Having a government scholarship to pursue an undergraduate degree tend to have a negative impact on students' final exam score
- Scholarship students' performance was 9% less compared to a non-scholarship student

For only online students

Variable	Coefficient	T-values	Significance
Intercept	2.32416	1.67	10%
GPA	3.61526	10.24	1%
Gender	-0.30198	-0.79	
Size	1.20832	3.19	1%
Scholar	-1.4784	-4.03	1%
ECH	0.00226	0.28	

Conclusion

- Higher GPA students likely to perform better in online learning environment
- In an online learning environment larger class size tend to have better impact on students performance
- Possible issue of moral hazard
- Scholarship students are like to do worse in online learning environment
- Cheating?

