The road to graduation: On-line or classroom

Dr. Diane Galbraith
Slippery Rock University

Dr. Sunita Mondal
Slippery Rock University

ABSTRACT

Research is available on the graduation rates among primarily on-line institutions and traditional universities, but not much on the effect of on-line classes within a university setting. According to Pew Research Center surveys conducted in spring 2011, 89% of four-year public colleges and universities offered online classes, and 46% of recent college graduates report that they had taken an online course (Parker, Lenhart & Moore, 2011). With the proliferation of on-line classes, this study aims to analyze the evolution of the class offerings in the business school of a four-year public university over the past seven years. In addition to examining the current trend regarding on-line classes, the project further investigates whether such offerings are related to graduation rates and/or graduation in 4 years. A discussion on grade inflation and other benefits and consequences of online course offerings in higher education are provided.

Keywords: online courses, graduation rates, academic performance, grade inflation

The educational landscape is dynamic and student expectations of a university campus and the commensurate learning process is changing. Many universities have varied delivery formats including the traditional classroom and face-to-face, on-line and a hybrid/blended/mixed mode that combines both throughout the semester. As a result, more questions abound for students prior to selecting a university and throughout their respective journeys. The road to graduation for students can be turbulent or smooth dependent upon many variables. Navigating through higher education requires some careful planning to reduce the potholes, wrong turns, and near collisions that can occur from the selection of major and minor courses of study, changes in majors or minors, the choice of participating in winter and summer class sessions, in-class vs. on-line courses, etc.

Much research has addressed the debt load for graduating students. Many have been burdened to such a degree, that it not only has superseded credit card debt, but has delayed normal post-graduate activities such as the purchase of homes, marriage and the subsequent start of families. In a study by Mark Warshawsky at George Mason University, (2014) undergraduate tuition and fees have tripled between 1980 and 2014.

As indicated in Figure 1 (Appendix), the cost of undergraduate studies is destined to continue to rise. This research explores and compares the university campus of in-class and on-ground learning in the classroom, with some of the results, both positive and negative of learning beyond the four walls in a virtual, on-line environment.

Previous research indicates both pros and cons of embracing the online format. While some studies find it beneficial for the institution and students of increased offerings of online courses in terms of cost effectiveness and easy accessibility, others indicate that online courses are detrimental to student learning, which eventually leads to lower completion rates (Jenkins, 2012). In light of the lack of consensus of the usefulness of online course offerings, this study aims to outline the impact on graduation rates of increased enrollments in online classes, for students within a primarily traditional public mid-sized university.

LITERATURE REVIEW

According to the AACSB Data Guide (2017), students are still actively selecting business institutions as their major of choice, despite the demographics relating to a shrinking undergraduate-eligible population. In fact, these recent statistics continue to look promising as the admissions have consistently grown over the past 7 years.

With a bright future ahead in Business, we will turn our attention to the student experience between on-line learning and the traditional classroom. According to a Pew Research report conducted in 2011, College Presidents seem to differ with the public in the value and quality of on-line classes. More than 50% of College Presidents report that these 2 delivery modes offer the same value, while only 3 out of 10 adults in America concur.

In a (2008) study by Babson Survey Research and Sloan Consortium responses from more than 2,500 colleges and universities, confirm the historic rise of on-line courses. Dating back to 1999, 44% of those universities with more than 15,000 students reported on-line offerings. As the competition for students intensify, most 4-year programs have expanded their delivery modes to attract students. As indicated in Figure 2 (Appendix), a 2011 Pew Research study, indicates that 75% of US colleges now offer on-line classes and at least 23% of students have taken at least one course on-line. Of the adults who have taken a course on-line, 39% believe that the learning formats provide similar educational value, but only 27% who have never taken an on-

line class believe that the value is similar. A University of Potomac study (2014) corroborates earlier research in the growth of online, with the following data:

- The total number of students enrolled in online courses: 6,700,000
- Current number of accredited online universities: 275+
- Amount of college students who have enrolled in at least one online course: 30%

Allen and Seaman, (2008), in *Staying the Course*…also researched whether on-line education was deemed to be a strategic initiative for higher-education institutions. These authors posed the question regarding whether on-line education was critical to the respondents' long-term strategy. Although the numbers have plateaued, online education continues to play a major part in the overall long-term strategies of the contributing institutions, with Public Universities agreeing at 70.7%; Private -Non-profit at 47.1%; and Private, For-Profit at 53.2%.

One of the downsides of the on-line environment is the increased potential for dishonesty. College students are very technologically savvy as they have grown up in a digital world. As such, a challenge of the on-line delivery format is the proliferation of plagiarism and cheating, as indicated in Figure 3 (Appendix). A 2012 survey from the Best College Reviews website reported that the plagiarism detection site, Turnitin.com, searched 38 million student papers for possible matches to existing online content. 156M matches were found with 146M of them from university students, predominately from Wikipedia and Yahoo Answers. Technology has played a significant part in this issue with the internet, the ease of Google answers, Wikipedia, cellular use, etc. With little to no supervision, no real fear of getting caught and the consensus that 'everyone's doing it', this trend is likely to persist.

On-line classes can also play to the strengths of Millennials as they are proficient with technology and consistently relate to their peers through a myriad of platforms. Lost in this digital freedom is the instantaneous and spontaneous group conversations, student engagement and interaction, personal touch, body language, educational support, etc. that is often crucial to effective communication and the learning process.

DATA

In order to address the research questions posed, data on the number of online courses taken by students is required. However, in order to establish the causal relation between the number of online courses taken and time to graduation, it is important to control for other academic attributes of students'. Hence the data utilized in this study controls for student's grade point average, SAT scores and so on. This study is based on a case and hence the data utilized was obtained from a Mid-Atlantic university. As one of a dozen plus institutions in a collective system, this research represents students from an average of ten different states. Being a part of this state system school, the university is a representative of its sister schools. Therefore, the results and recommendations from this study can be generalized to other campuses as well as to universities of a similar nature.

The data over the last 7 years confirm the trend in an increased adoption of online courses, especially during the summer and winter sessions. Since 2011, 57.35 percent of business students have taken at least one online course. The number of online course offerings has increased over the number of years. As indicated in Figure 4 (Appendix), the current trend in the number of online course offerings at the university, versus such course offerings in the School of Business (SOB). There is a clear positive trend in the number of courses offered online throughout the university, indicating the keenness of the administration on the adoption of the

medium of instruction which best suits the current student needs. At the department level, however, the number of such course offerings seemed to have peaked during 2013, and have levelled off since then.

In particular for the SOB, as indicated in Figure 5 (Appendix), the percentage of students who have taken at least one online course increases with a higher class standing. Contingent on the availability of courses online, students are more inclined to take online courses as they near graduation. In particular, with the offerings of such courses becoming incresingly available over the summer and winter sessions, students take advanatge of such courses which leads to the possibility of earlier graduation.

In this paper, we examine the relationship between the number of online courses taken by the student with their graduation rates. In particular, this research seeks information on whether online course offerings by institutions aid in lessening the time that leads to graduation for students. Our sample consisted of all students in the School of Business, since 2011, with the resulting sample size of 6617.

The summary statistics for the data utilized in this study is reported in Table 1 in the Appendix of the paper. The average values for the main variables utilized in the data set, along with their respective standard deviations are reported in column one of Table 1. The variables used in the study include SAT Math and SAT Verbal scores, student's GPA, their ACT Math and ACT Verbal scores, their age, graduation rate, percentage of female students, and their ethnicity information, for the entire sample. The second and third column reports the same set of statistics for students who have taken at least one online course versus students who have never taken an online course, respectively.

Upon further examination, probing into the differences in academic performance between the different groups, the data reports higher GPA for the students taking online classes (2.98) compared to the students who never took an online class (2.59). It took considerably less time to graduate for students who took online courses (3.01 years), as opposed to students who never took online courses (5.47 years). The students in the group who never took an online course, on average are older (42.33 years), compared to the students taking online classes (24.09 years). Deeper analysis of age groups revealed that a few older nontraditional students contributed to this difference. In terms of the gender distribution, a higher proportion of traditional students are female (25 percent), compared to the online students (12.5 percent). There are differences in the ethnicity reported for the two different groups of students. While a majority of traditional students are of reported race, white (53 percent), only 34 percent of the online students report their race as white. There are no differences in the proportion of students in each group that report their race as African American (1 percent of students in each group). The ACT as well as SAT scores (for both Math and Verbal) are comparable across these two groups of students. The descriptive statistics indicate these two groups of students, ones who took at least one online course versus the group where no students took an online course are otherwise similar enough to justify the analysis.

METHODOLOGY AND RESULTS

The methodology for this study is based on the model of an investment in human capital, which makes workers more productive. It is important to incorporate education, and hence knowledge, the two most important contributors to a worker being more prolific. This study captures this concept by utilizing two different dependent variables as a measurement of student

success in the undergraduate program: the grade point average (GPA_i) and the number of years it takes for students to graduate ($GRAD_i$). The higher the number of years it takes for graduation, and [particularly so if the number of years exceed 4], the implication is, the lower the success rates for students. The hypothesis refers to a negative correlation between the number of online courses taken and time to graduation, with a higher number of online classes lowering the number of years it takes to graduate. This hypothesis is based on the argument that students' have greater flexibility throughout the semester in enrolling in the online courses, with such courses being offered over the summer and winter terms, in addition to the fall and spring semesters. As a result, students can fast-track their path to graduation.

In the data analysis, since the outcome variables refer to the student success rates, it is important to be able to control for any other variables that might attribute towards students' achievement. Towards that end, a set of variables which might be correlated to the student GPA as well as graduation time are included in the analysis. These variables include student age, their major in school, gender, race, SAT scores, and ACT scores

Specifically, the model takes the following functional form:

$$GRADTIME_i = \gamma + \phi_1 ONLINE_i + \phi_2 X_i + \nu_i \text{.....(1)}$$

where $GRADTIME_i$ is the number of years, starting from the time students entered school as freshman, until graduation.

The methodology most suitable to analyze the data includes conducting an Ordinary Least Squares (OLS) regression analysis.

The results from the OLS estimation process are reported in Table 2 of the appendix. The primary variable of interest in this study is Online, which refers to how many online courses the students have taken. The results indicate that taking an online course has a negative and statistically significant impact on the number of years it takes to graduate. In particular, an additional online course taken reduces the graduation time by 0.09 years.

With regards to the analysis for the set of control variables, the results indicate, given every other variable unchanged, an additional ten years of life, lowers graduation time by 0.8 years. Further examination of the effect of student academic aptitude (as captured by SAT Verbal scores) indicates that a higher aptitude has a positive and statistically significant impact on reducing the graduation time. However, the magnitude of these effects are not large. SAT Math scores had no statistically significant impact on graduation time.

As indicated in Table 3 (Appendix), the OLS estimation of equation (1) with GPA as the outcome variable. In this equation, primary variable of interest is Online, which refers to the number of online courses taken by students. The result is of interest indicating that the coefficient of Online is positive and highly significant. Thus, the results confirm that with increased number of online courses taken, the students' overall GPA improves. This result raises some discussion regarding the appropriateness of the testing methods in online classes, and whether adoption of increasing number of online courses by institutions make them more vulnerable to the problem of grade inflation.

Age has a positive and statistically significant impact on student GPA. Similar are the effects of the gender variable, with female students achieving higher GPA's compared to their

male peers. Higher SAT scores have a positive and statistically significant impact on students' GPA.

FUTURE RESEARCH

This research clearly indicates a correlation between on-line classes and grade inflation. This poses more questions for future research such as, are the classes easier, is there significant cheating, are the individual students actually taking the courses, vs. their friends, parents.

Furthermore, evaluating the quality of on-line classes and/or the learning experience might also be warranted.

CONCLUSIONS

Many higher-educational institutions are focusing on preparing their business students to be work and career ready upon graduation. These essential skill sets are imperative for students to enter the workforce and integrate quickly. From the student loan debt pay-off perspective and the overall return on investment derived from an undergraduate diploma, students must immediately transition to the workplace. Securing gainful employment quickly is essential to begin to reduce their financial burden and realize a pay-off from their education and begin to reap the fruits of their labor. With on-line classes including winter and summer sessions, students can often complete their respective degrees more expediently, therefore reducing the cost and financial implications. In particular, our findings indicate, students' could lower time to graduation by 0.09 years with each additional online course taken. Their road to graduation has a higher speed limit and fewer tolls as they graduate earlier than their peers on average. Degree completion in four years or less is now much easier. University administration seem pleased with the additional revenues from on-line learning, but at what cost? Students may also be benefitting with higher grades and the rise of cheating/academic dishonesty, so the potential employer should beware as well. There are pros and cons to both modes of delivery. The question remains for further research, is the quality of the education being compromised or are the variety of delivery methods similar in value, but dependent upon the students' preference and/or work/life scenario?

REFERENCES

AACSB. (2017). *Business school data guide*. Tampa, FL: AACSB International.

Allen, I. Elaine and Seaman, Jeff. (2008). *Staying the course online education in the United States.* Needham, MA: Babson Survey Research – Sloan Consortium.

Becker, H. S. (1967), Whose Side Are We On? *Social Problems, Vol. 14, No. 3,* 239-247.

Cheating in College: The numbers and research. *Best College Reviews*. Retrieved December 1, 2017 from: https://www.bestcollegereviews.org/cheating/

Hollis, Ericka T. (2016). Traditional Liberal Arts Colleges' Consideration and Adoption of Online Education: A Presidential Perspective. *Theses and Dissertations--Education Science.* 21.

Jenkins (2012). Online Classes and College Completion. *The Chronicle of Higher Education.*

Melguizo, T., Bos, H., & Prather, G. (2011). Is developmental education helping community college students persist? A critical review of the literature. *American Behavioral Scientist*, 55(2), 173-184

Parker, K., Lenhart, A., & Moore, K. (2011). The Digital Revolution and Higher Education. *Pew Research Center Internet, Science & Tech.*

Sun, A., & Chen, X. (2016). Online education and its effective practice: A research review. *Journal of Information Technology Education: Research*, 15, 157-190.

University of the Potomac. (2014). *Comparison of online vs. traditional learning.* Retrieved December 6, 2017 from: https://potomac.edu/learning/online-learning-vs-traditional-learning/

Warshawsky, M. (April, 2017). *Increased federal funding for higher education produces adverse effects.* Retrieved December 12, 2017 from: https://www.mercatus.org/publications/increased-federal-funding-higher-education-produces-adverse-effects

APPENDIX

Figure 1: Trend in Tuition Charges

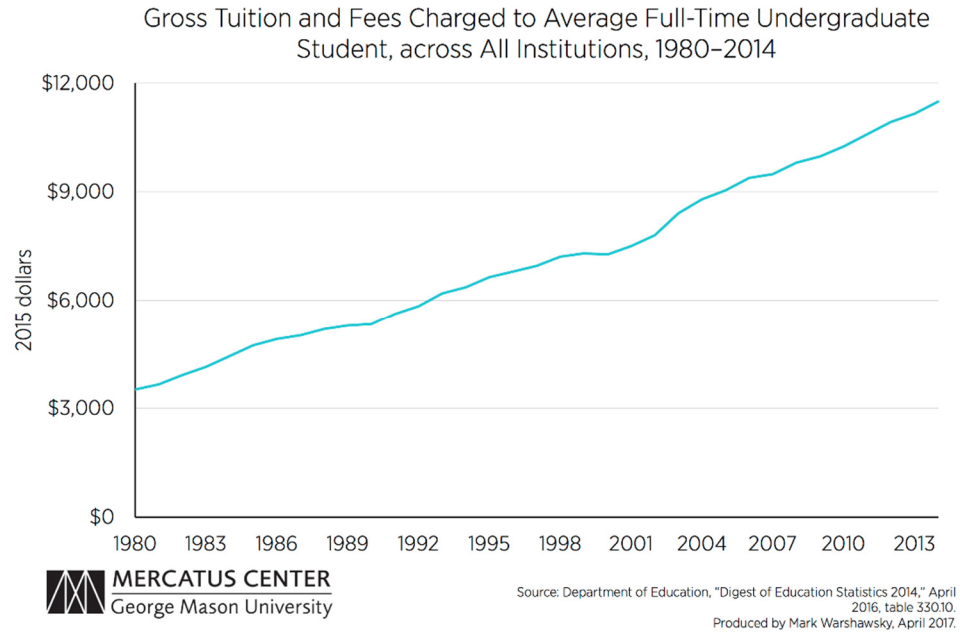


Figure 2: Opinion regarding Online versus Face-to-face courses

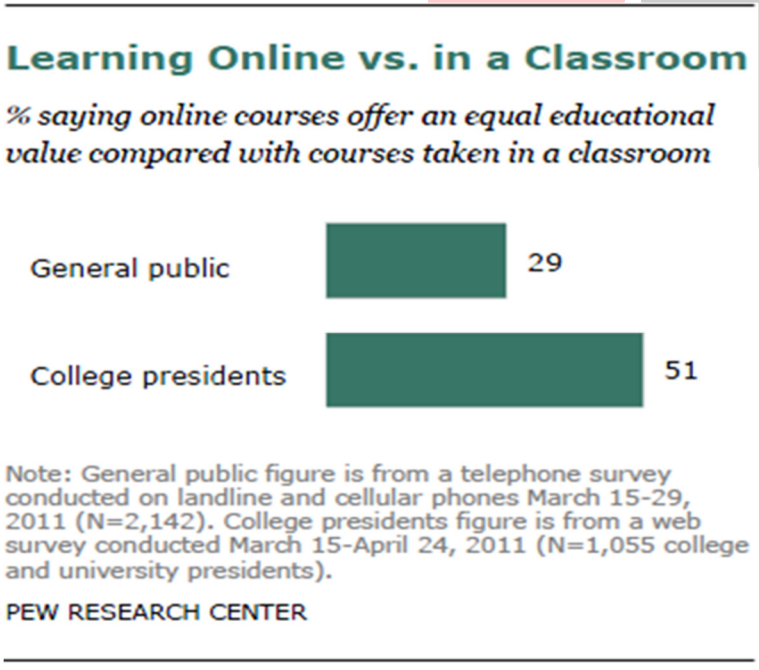
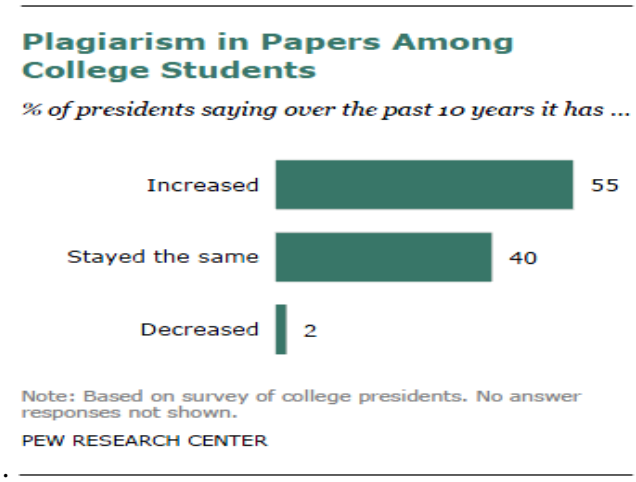


Figure 3: Plagiarism



.

Figure 4: Trend in Online Classes

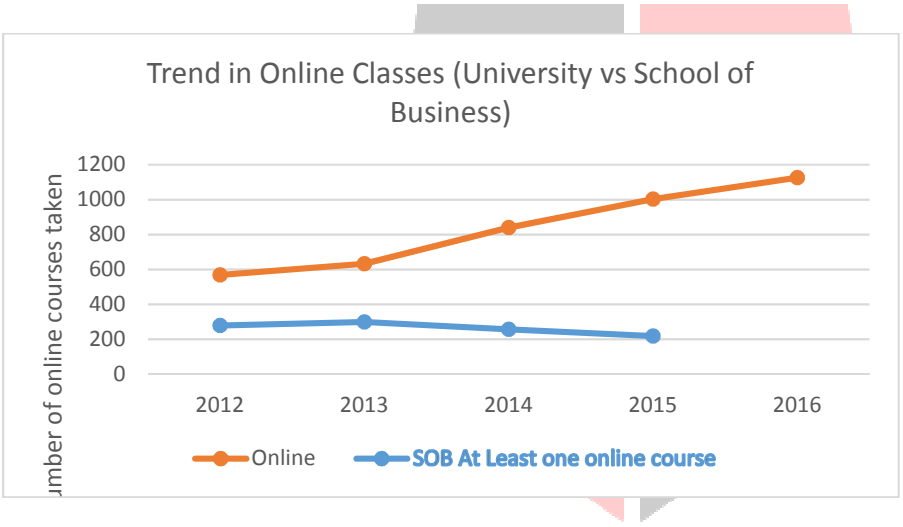


Figure 5: Proportion of Students Taking Online Courses

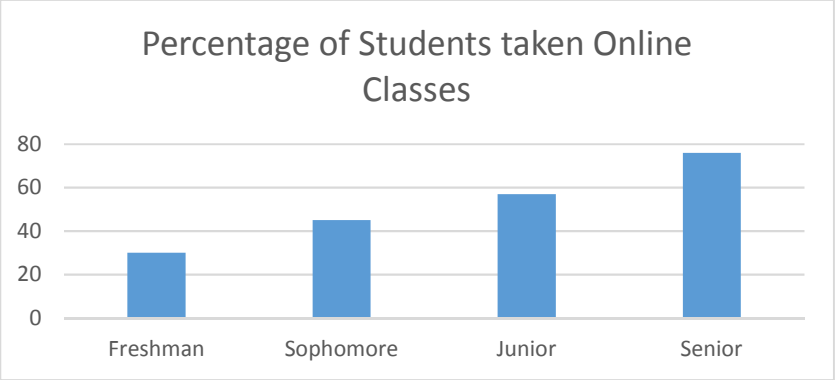


Table 1: Descriptive Statistics: Summary Statistics of the data

	All students	Online classes	No Online classes
Dependent Variables			
GPA	2.71 (0.82)	2.98 (0.61)	2.59 (0.86)
Graduation[1]	4.79 (73.64)	3.01 (1.18)	5.47 (86.69)
Female (%)	38.47	12.54	25.93
Age	37.14 (14.96)	24.09 (4.94)	42.33 (14.44)
Ethnicity			
White (%)	87.61	34.17	53.43
African American (%)	1.82	0.99	0.82
Asian (%)	10.57	7.28	3.28
Academic Aptitude			

[1] Graduation refers to the number of years that passed between initial enrollment and final date of graduation.

SAT Verbal	482.64 (66.38)	482.71 (65.01)	482.57 (67.81)
SAT Math	507.82 (68.72)	508.48 (66.31)	507.13 (77.14)
ACT English	19.79 (4.22)	19.77 (3.85)	19.58 (4.39)
ACT Math	21.02 (3.74)	21.13 (3.44)	20.82 (3.89)
Observations	6295	1852	4443

Table 2: Results from OLS Regression Analysis
(Outcome Variable: Grad time)

Constant	5.99 (0.56)
Online	-0.09*** (0.01)
Demographics	
Female	0.10 (0.07)
Age	-0.08*** (0.01)
Academic Aptitude	
SAT Verbal	0.0014*** (0.0006)
SAT Math	-0.0001 (0.0005)
GPA	-0.31*** (0.08)
Observations	988
Adjusted R-squared	0.05
F-statistic	9.64

The regression results report both the coefficient estimates and the standard errors. *** denotes the 99 % confidence interval, ** denotes the 95 percent confidence interval, * denotes the 90 percent confidence interval.

Table 3: OLS Regression Results for Equation (1)
(Dependent Variable: GPA)

Constant	0.45*** (0.18)
Online	0.04*** (0.01)
Demographics	
Female	0.23*** (0.03)
Age	0.01*** (0.004)
Academic Aptitude	
SAT Verbal	0.001*** (0.0002)
SAT Math	0.003*** (0.0002)
Observations	2167
Adjusted R-squared	0.12
F-statistic	58.68

The regression results report both the coefficient estimates and the standard errors. *** denotes the 99% confidence interval, ** denotes the 95 percent confidence interval, * denotes the 90 percent confidence interval.