

Online Classes: An Evaluation by Traditional-Aged Students

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Our sample of traditional-age undergraduate students offers self-reported perceptions on online and traditional face-to-face classes. The results reveal that traditional classes are preferred and evaluated superior for learning (including high-order levels on Bloom's Taxonomy), participation, and creating a sense of community. Students also spend more time studying and doing homework in traditional classes. Grades are perceived comparable across delivery methods, but students with higher Grade Point Averages prefer traditional classes, as do introverts, and males. Online classes do have advocates, with about a quarter of students preferring them to traditional classes because of convenience and flexibility.

Convenience is the most cited reason for taking online classes (Watson & Rutledge, 2005; Wuensch et al., 2008). For non-traditional students, it allows them the flexibility to maintain full-time jobs and personal commitments while pursuing an education. For this segment, online courses remove time and space barriers to provide a viable alternative to traditional face-to-face courses (Tanner et al., 2006). Lapsley et al., (2008) found both delivery methods provided equivalent learning opportunities.

Convenience attracts students, but they demand more: quality, meaningful assignments, and high-quality feedback (Tricker et al., 2001), which is timely (Gallien & Oomen-Early, 2008; Shea et al. 2002). Structure, as defined by objectives, assignments, and deadlines, also has been shown to influence student satisfaction (Stein, 2004). Student-to-student interaction strongly influences satisfaction (Jung et al., 2002). A lack of collaboration led to negative emotions about an online class (Nummenmaa & Nummenmaa, 2008). Faculty interaction with students directly affects student satisfaction (Chickering & Gamson, 1987). Effective online faculty have strong written communication skills, promote discussion, provide timely feedback, and encourage student collaboration and interaction (Spangle et al., 2002). With online courses, a strong predictor of student satisfaction and learning is creating a sense of community (Woods & Ebersole, 2003). When compared to traditional classes, almost a third of respondents felt less connected (Watson & Rutledge, 2005). Overall faculty should be actively engaged in the class (Jones, 2012).

Studies comparing online and traditional classes have found online superior or equal: i) student self-reports indicate greater or equal learning in online (Arbaugh & Stelzer, 2003; Fjermestad et al., 2005; Hannay & Newvine, 2006); ii) student self-reports indicate more time spent in online (Hannay & Newvine, 2006); iii) more active participants (Hiltz & Shea, 2005; Shea et al., 2002); iv) similar or better grades in online (Daymont & Blau, 2008; Friday et al., 2006; McLaren, 2004); and v) similar levels of satisfaction (Allen et al., 2002; Kelly et al., 2007). Student withdrawals from online classes and students' perceptions that online classes would be easier are related (Nash, 2005). A meta-analysis conducted by the Department of Education of 1,000 studies since 1996 found online education marginally better than the traditional classroom on learning outcomes (Department of Education, 2010).

"The proportion of students taking at least one online course has increased from fewer than 1 in 10 in 2002 to nearly one-third by 2010, with the number of online students growing from 1.6 million to over 6.1 million over the same period - an 18.3% compound annual growth rate" (Allen & Seaman, 2012: 3). This trend will only continue. The Chronicle of Higher Education examined data trends and polled experts, including admissions officials, to predict education in 2020. More than a third of respondents predicted 60% of students will be taking only online classes (2009). Much of this increase is attributable to the success of for-profit institutions such as The University of Phoenix, "a disruptive innovator" (Burnsed, 2011).

There are concerns about online classes. "There is no face-to-face contact, no context clues, and no opportunity for immediate dyadic communication" (Tanner et al., 2009: 32). Students believe physical separation of students and of students and faculty make online classes inferior to traditional classes in

communication (student/student and student/faculty), understanding course material, especially complex material, and less community and connectedness (Ritter et al., 2010; Wuensch et al., 2008).

Concerns also occur on the delivery side. In a survey of almost 5,000 faculty members, two-thirds “believe that the learning outcomes for an online course are inferior or somewhat inferior to those for a comparable face-to-face course,” although “faculty members with a greater exposure to online education have a less pessimistic view than their peers (Allen & Seaman, 2012: 3). “Fewer than 6% of all instructors consider online to be either superior or somewhat superior to face-to-face instruction” (Allen & Seaman, 2012: 9). Online learning is perceived more favorably by students than faculty (Tanner et al., 2009; Wilkes et al., 2006). A recent study of human resource professionals undertaken by the Society for Human Resources found “44% agreed or strongly agreed that online learning was of lower quality than face-to-face, whereas only 3% thought the same of traditional learning” and 60% “agreed or strongly agreed with the statement that job applicants with traditional degrees are preferred by my organization to applicants with online degrees, presuming work experiences are similar” (Society for Human Resources, 2010).

Gender differences may also exist. Women have done better in both online and traditional classes (Friday, 2006). Arbaugh (2005) found the opposite: perceived learning was lower for females than males, while Daymont and Blau (2008) found them equal.

Methods

The survey was developed through a literature review and multiple iterations among undergraduate students; a pre-test using protocol analysis with 31 undergraduates was employed. It was administered at a southeastern non-secular university to traditional-age undergraduate students. The university has been providing online classes since the late 1990s. A convenience sample was used. (Note: Freshmen were excluded because they cannot take online classes at the university). The data were analyzed in SPSS version 20. Data were recorded by one person and reviewed for mistakes by another. Frequencies were then examined to ensure no data were outside the range of feasible answers. Individual questions were tested against the scale midpoint of four in a one-sample t-test (seven-point scale). Hypotheses were tested at the .05 level. A two-sample t-test was used when comparing across groups, again at the .05 level. Pairwise deletion was used (i.e., deleted by individual by question).

Logistic regression is used to compare respondents based on preferences (i.e., online or traditional) by online classes taken; personality (introvert-extrovert), grade point average (GPA), hours spent studying, and gender. The personality scale, from introversion to extroversion, is an eight-item scale bounded by strongly agree to strongly disagree (five points) (John & Srivastava, 1999). Logistic Regression does not require assumptions about the independent variables (i.e., normality, linearly related, or equal variances with groups). Multicollinearity is a potential problem. Outliers are detected through examination of the standardized residuals (values greater than three). The -2 Log Likelihood (perfect model equal zero, where each cases predicted and actual probabilities are compared and summed) and Goodness of Fit indicates model fit (low values better) is used to assess model fit. Chi-squared is also used to assess the overall model by comparing the estimated with an intercept only model. Cox & Snell and Nagelkerke R^2 (bounded by zero and one) indicate the proportion of variability in the dependent variable accounted for by the equation's predictor variables. The Hosmer and Lemeshow Test with a p-value greater than .05 indicates good fit (Hilbe, 2009). Each predictor's significance is tested through a Wald statistic. For each predictor, we will examine the unstandardized regression coefficient (B), Wald statistic, and odds ratio (Exp (B)). The odds ratio represents the increase (decrease if less than one) in the odds of being classified in a category (dependent variable equals one).

Results

The survey was completed by 117 students. Three surveys were unusable because of incomplete data ($n = 114$). All students have taken at least one online class. No question had more than three missing values. Respondents are predominately female (64%) (Table 1). They are upper-class (82%) School-of-

Business students (69%) who live in campus dormitories (52%) with an average GPA of 3.17. They study an average of 10 hours weekly (10.07), while working (including work-study and internships) almost 17 hours (16.55, with 15% not working). They pay for more than a third of their college expense (38%), while 17% pay nothing. They are primarily from suburban areas (39%), followed closely by rural (27%), and urban (34%). A third (37%) are not involved with student organizations (18.4% are on a sports team) among all the average number of organizations belonged to is 1.46.

Table 1: Demographics (n=114)

Category	Percent	Category	Percent
Gender		College Major	
Female	64% ¹	Business	69%
Male	36%	Non-business	25%
		Undecided	5%
Residence (home)		Residence (campus)	
Urban	34%	On-campus	52%
Rural	27%	Off-campus (family)	20%
Suburban	38%	Off-campus (non-family)	28%
Class Rank			
Freshman	5%		
Sophomore	11%		
Junior	34%		
Senior	48%		

¹Because of rounding error, totals may not sum to 100%

They have taken an average of 2.8 online classes (six eight-week terms annually are available and students can take one class per term with faculty advisor and department chair approval). The major reason for taking online classes is flexible times (62%) followed by traditional classes are at inconvenient times (47%), easier workload than traditional classes (29%), save gas money (28%), traditional class unavailable (27%), and no travel involved (23%).

Respondents found online classes unexciting, predictable, challenging, not fun, and informative, but not simple (neutral) (Table 2). They were found to have created synthesis and evaluation. (Students were provided with a definition of two levels of Bloom’s Taxonomy to answer questions (Bloom, 1956)). Synthesis was defined as use of old ideas to create new ones; generalize from given facts; relate knowledge from several areas; and predict, draw conclusions. Evaluation was defined as compare and discriminates between ideas; assess value of theories, presentation; make choices based on reasoned argument; and verify value of evidence.) (University of Victoria, 2010). Seventy percent of respondents were able to identify synthesis when presented with a definition.

Table 2: One-Sample t-Tests (Online Classes)

Questions	t-stat. (mean)	p-value
1) Online classes are exciting. ¹	-5.42 (3.25)	.000
2) Online classes are predictable.	5.50 (4.81)	.000
3) Online classes are challenging.	3.53 (4.46)	.001
4) Online classes are simple.	0.77 (4.11)	.444
5) Online classes are fun.	-6.13 (3.11)	.000
6) Online classes are informative.	4.70 (4.58)	.000
7) Online classes achieve synthesis.	4.72 (4.58)	.000
8) Online classes achieve evaluation.	5.90 (4.72)	.000

¹Poor Description (1) to Perfect Description (7)

Traditional classes were found to be predictable, challenging, fun, informative, and created synthesis and evaluation (Table 3). They were neutral on whether they were exciting and indicated that simple was a poor description.

Table 3: One-Sample t-Tests (Traditional Classes)

Questions	t-stat. (mean)	p-value
1) Traditional classes are exciting. ¹	0.82 (4.12)	.415
2) Traditional classes are predictable.	2.61 (4.38)	.000
3) Traditional classes are challenging.	7.81 (4.95)	.000
4) Traditional classes are simple.	-3.39 (3.50)	.001
5) Traditional classes are fun.	2.24 (4.34)	.027
6) Traditional classes are informative.	10.24 (5.23)	.000
7) Traditional classes achieve synthesis.	9.83 (5.22)	.000
8) Traditional classes achieve evaluation.	8.01 (5.04)	.000

¹Poor Description (1) to Perfect Description (7)

Traditional classes when compared to online are viewed as more exciting, challenging, fun, and informative, and achieving synthesis and evaluation better (Table 4). Online classes are viewed as more predictable and simpler.

Table 4: Paired-Samples t-Tests (Online and Traditional Classes Compared)

Questions	t-stat. (mean online) (mean traditional)	p-value
1) Traditional/online classes are exciting. ¹	-4.78 (3.25) (4.12)	.000
2) Traditional/online classes are predictable.	2.34 (4.81) (4.38)	.021
3) Traditional/online classes are challenging.	-3.27 (4.46) (4.98)	.001
4) Traditional/online classes are simple.	2.97 (4.07) (3.50)	.004
5) Traditional/online classes are fun.	-5.75 (3.13) (4.34)	.000
6) Traditional/online classes are informative.	-3.94 (4.58) (5.25)	.000
7) Traditional/online classes achieve synthesis.	-4.18 (4.57) (5.21)	.000
8) Traditional/online classes achieve evaluation.	-2.33 (4.72) (5.07)	.022

¹Poor Description (1) to Perfect Description (7)

More than half of the respondents (58%) prefer traditional classes (Table 5). They spend more time studying and doing homework in them (67%) and participating (67%). Surprisingly, grades are perceived equal between online and traditional. Traditional provides a better sense of community (84%), learning environment (65%), synthesis (53%), and evaluation (54%). However, when comparing GPAs by preference, those who prefer traditional have higher GPAs ($t(75) = -2.45$; $p = .017$; $M = 2.93$ (online) and $M = 3.21$ (traditional)).

They were neutral about whether they would take online classes in the future even if the same class is available in the traditional format ($t(113) = -0.34$; $p = .732$; $M = 3.94$) (Strongly agree (1) to strongly disagree (7)), take more than one online class at a time ($t(113) = -0.54$; $p = .593$; $M = 3.90$), and, unequivocally, that they would not prefer to take all online classes during a semester ($t(113) = 4.82$; $p = .000$; $M = 4.90$).

Table 5: Percentages (Online and Traditional Classes Compared)

Questions	Online	Traditional	Equally
1) I prefer:	20%	58%	23% ¹
2) I spend more time studying and doing homework in:	21%	67%	12%
3) I participate more in:	23%	65%	12%
4) I get better grades in:	34%	33%	33%
5) Which provides a better sense of community?	6%	84%	10%
6) Which provides a better learning environment?	11%	65%	25%
7) Which provides greater "synthesis?"	12%	53%	35%
8) Which provides greater "evaluation?"	6%	54%	40%

¹Because of rounding error, totals may not sum to 100%

Comparing those that prefer online and traditional classes, we estimated a Logistic Regression. The -2 Log Likelihood value is 54.67, and the model is significantly different from the constant-only model (chi-squared (5) = 22.60; $p < .000$) (Table 6). Forty-one percent of the variation in the model is accounted for in the predictor (Nagelkerke $R^2 = .41$). The Hosmer and Lemeshow Test is not statistically significant (5.96 (8), $p < .652$), indicating a good fit. The hit rate is 81.1%, with 93.1% of respondents who prefer traditional classes, and 37.5% who prefer online correctly identified. The Wald statistic is significant for the grade point average, hours spent studying, and gender (Table 6).

The odds for males are about 538% higher than the odds for females for preferring traditional to online classes. A one-unit increase in the personality scale results in a 6% increase in the odds of preferring a traditional to online class (Note: Higher values on the personality scale indicate more extroversion.) Taking one more online class increases the odds of preferring traditional to online by 21%. Finally, a one-unit increase in GPA increases the odds of preferring a traditional class versus an online by 1,221%.

Table 6: Logistical Regression

Variable	Odds Ratio		SE
Classes Taken	1.21		.19
Personality Scale	1.06		.05
Grade Point Average	12.21*		1.00
Hours Studying	1.28**		.09
Gender	5.38*		.83
Chi-squared		22.60 (.000)	
R ² (pseudo)		.41	
N		114	

* $p < .05$ ** $p < .01$

Discussion

Our results are similar to other researchers: flexibility and convenience are important determinants to taking online classes (Bocchi et al., 2004; Hiltz & Shea, 2005) and to a lesser extent, but still important: easier workload. Online and traditional classes both provided a predictable, challenging, and informative environment that created synthesis and evaluation. Traditional classes are fun, while online are unexciting and not fun. When compared together, the traditional class is superior in creating an exciting, challenging, fun, and informative environment that achieves synthesis and evaluation better, while creating a better sense of community and overall learning environment. This contradicts much of the research where learning outcomes are similar. It is similar to evaluations by faculty and HR professionals (Allen & Seaman 2012; Society for Human Resources, 2010).

Online is clearly perceived inferior in generating a sense of community. Learning and creating an online community have been linked (Arbaugh, 2005; Swan, 2003). For these reasons, traditional is the preferred delivered method. Students in traditional classes also spent more time studying, doing homework, and participating, yet grades across delivery methods are perceived equal across the two. Students unequivocally do not want to take all classes online. Online does have advocates. Almost a quarter prefer online, about the same number who prefer both, but on all important metrics, traditional is perceived superior. Delivery modes are not perceived interchangeable.

Females appear to prefer online to males, probably because they are better students: higher GPAs ($t(101) = -2.45$; $p = .016$; $M = 3.10$ (male) and $M = 3.31$ (female)) and more disciplined, although we did not measure that. This contradicts prior research which found no differences (Daymont & Blau, 2008). Extroverts, not surprising, want the face-to-face platform, where it is easier to exhibit. Taking additional online classes increases the preference for traditional classes. The better students, as measured by GPA, prefer traditional to online.

Online courses because of their flexibility and convenience will continue to flourish. The question becomes how to enhance the learning community and ensure comparability in learning. A seismic change for online education is massive open online courses (MOOCs). Carnegie Mellon University has offered MOOCs for a decade (Perez-Pena, 2012). Coursera, a consortium of universities led by Stanford,

Princeton and Duke, offers 100 courses free (Lewin, 2012). EdX, a joint venture of Harvard and MIT, and Udacity also offers MOOCs. How this impacts profit-making online institutions, whether it will cannibalize participants' enrollments, and if the marketplace will accept these non-credit courses is unclear? Most students are in foreign countries, but that will change, especially if domestic institutions offer them for credit? Will faculty be relegated to grading and supplementing free lecturers from a few academic stars online? Benefits may include the creation of globally-blended classes where faculty can incorporate online material from an array of lecturers, breaking academic silos, and focusing more on difficult material in the classroom (Brooks, 2012). Udacity has "placed about half a dozen students into jobs" already (Lytle, 2012). Large introductory classes taught in lecture halls may be the first casualty for traditional schools (Burnsed, 2011).

Limitations and Future Research

We did not directly measure learning, nor confirm student grades. We did not control what types of courses these students took (i.e., subject matter and course level), and whether there was a relationship between learning, for example, and type of course. Our sample was restricted to traditional-age students at one university, which is primarily teaching-oriented and the average class size is around 15. Would similar results occur with a research-oriented institution that has large lecture hall introductory classes?

Future research should compare traditional-age and non-traditional age students. Since our sample is traditional-age students, they may value face-to-face interaction and the structure of traditional classes more. Learning's impact can be statistically decomposed through regression analysis (Friday, 2006; Hanney & Newvine, 2006). Students did not record satisfaction levels, although we did measure components of it. We could gather perceptions from students and faculty about online courses. Finally, course duration may impact satisfaction. During a five-week online course, student satisfaction with communication with the faculty diminishes but increases for student-to-student communication (Ferguson, 2010).

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