



The Internet Will Not Replace Us

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Abstract

This paper examines the trends in online programs and enrollment to support the argument that those attracted to full time online programs are place (and time) bound nontraditional students looking to continue their education (e.g., working professionals, stay at home parents, active duty military). The authors also survey the literature to explain the reasons why students choose online programs versus face-to-face education, concluding that the motivations for choosing online learning are unique and pose no threat to long term sustainability of physical universities.

Trends in Online Education

Since 2002, the Babson (College) Survey Group has created an annual report regarding the state and trends of online education. Data from these reports are summarized below. While there are varying definitions of an online course, the Babson Survey Group defines an online course as “one in which 80% or more of the course content is delivered online.”¹ All students who were enrolled in one or more online courses were included in this data.

Figure 1 shows the overall enrollment trends in higher education since 2002. Caution should be used when interpreting these results as the methods used to gather data have changed during this time period. In 2012, the Babson Group switched their data collection methods from surveying and projecting from individual institutions to using data from the United States Department of Education’s National Center for Education Statistics’ Integrated Postsecondary Education Data System (IPEDS). Comparisons of the two methods yielded similar results in overall enrollment, but the Babson survey methods resulted in slight overestimates for the number of distance courses offered.² Despite these data collection issues, the trend remains clear. While overall enrollment in higher education has stagnated, the amount of students pursuing their education online has increased.

As of Fall of 2016, almost one-third of students were taking at least one course at a distance (online).¹ Many public universities are using online instead of in-person instruction to cope with campus restrictions (e.g., classroom space, schedule conflicts). These programs are not fully online, but offer an occasional online course to address logistical bottlenecks. Of all students taking at least one online course during their studies, approximately two-thirds are students who live on campus and 83% of the students are undergraduates.¹ These classes could be considered a one-off in the educational experience of traditional undergraduates. There are, however, an increasing number of students who are enrolled in fully online educational programs. Approximately one-third of online students include those enrolled in fully online programs.

Many of these programs are offered by private institutions that target online education almost exclusively for geographically distant students.³ The availability of these programs differ by degree level and degree program.

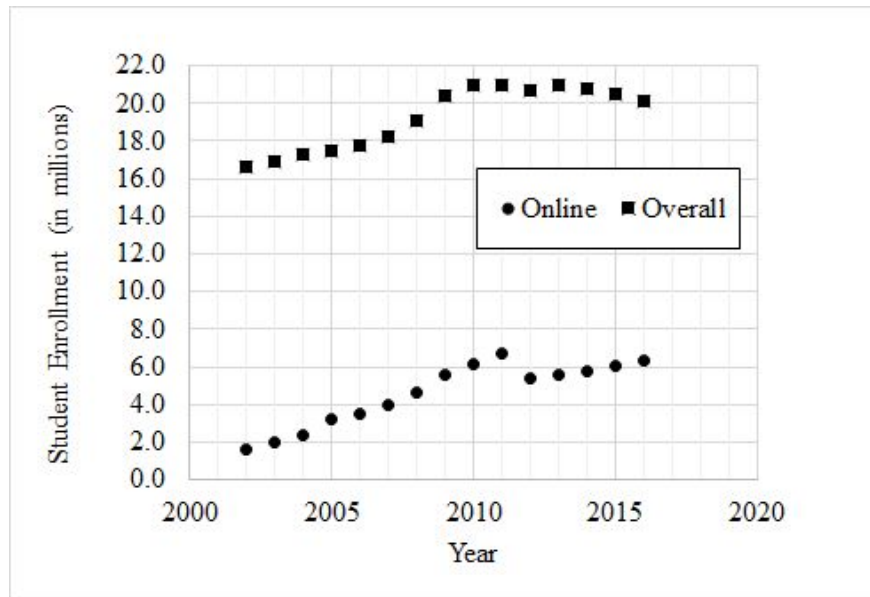


Figure 1. Trends in Online Learning (Adapted from Babson Survey Group Reports)^{1,4,5}

In general, the number of students taking courses online are increasing for both students in one online course and those in fully online programs.⁶⁻⁸ For example, in 2015, approximately 2.9 million students were enrolled in fully online programs with an additional 3.0 million students enrolled in at least one online course.⁶ In 2011, 32% of undergraduate students were enrolled in at least one online course as compared to 36% of graduate students.⁶ A 2010 article posted in The Engineer reports that a survey of eleven universities which offer online engineering master's programs indicated program growth of 79% from 2005 to 2010.⁹ Online programs are more popular at the graduate level for a number of reasons. First, online graduate programs are more accessible and flexible for the needs of the audience.¹⁰ Secondly, graduate courses typically are not as heavily laboratory-based as undergraduate programs, requiring less in-person education.¹¹⁻¹² Third, while undergraduate education is typically accredited by organizations such as ABET, master's programs are typically not accredited, allowing universities more flexibility in offering some graduate courses online.¹²

Additionally, looking at online enrollment by degree program reveals some interesting trends. A 2013 study by Pontes and Pontes indicated that students enrolled in engineering are significantly less likely to be enrolled in distance education than students in business, computer science, health, and education.¹³ These trends are shown in Figure 2. It would appear that business and computer science rely more heavily on online modes for course delivery whereas engineering, math, life sciences, and physical sciences are among the lesser adopters of online course delivery. Engineering courses in particular have fewer online offerings due to significant laboratory requirements, heavy computational requirements, and emphasis on ABET accreditation.^{10, 12, 14}

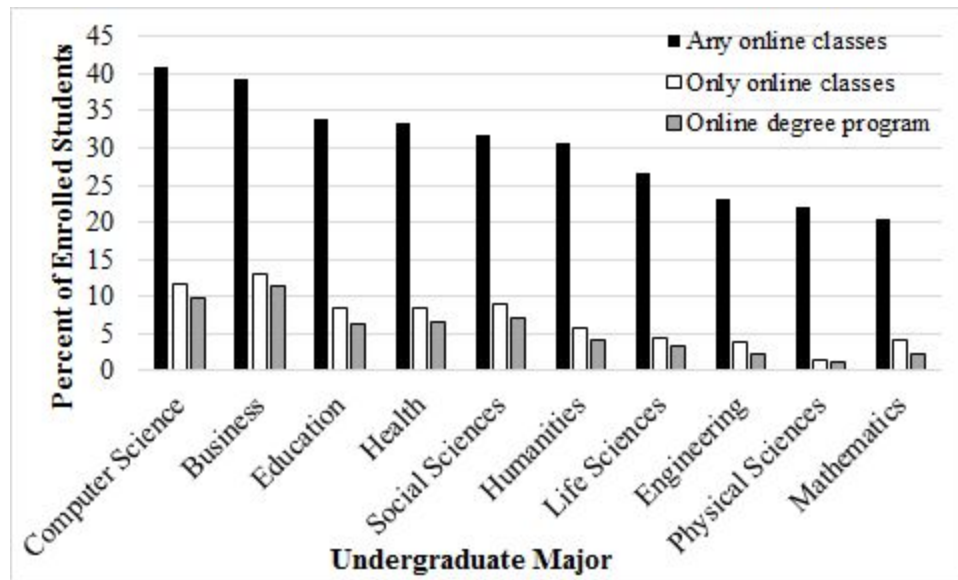


Figure 2. Percentage of Undergraduate Students Participating in Distance Education (2011-2012) from the 2014 Digest of Education Statistics⁶

Why students choose to enroll in online programs

The reasons students choose to pursue higher education in fully online programs has remained remarkably consistent since the early years of online education through today - necessity and convenience.^{10, 15-18} Learner preference among those who have previously had success with online learning can also be seen as another reason, but to a much lesser extent.¹⁹ The literature regarding online learning choice is not discipline specific, but applies to the needs of working parents, no matter their careers. However, it is reasonable to assume that engineers (who also have careers and families) pursue online learning for the same reasons as everyone else. Online learning continues to be primarily a vehicle for working adults to further their education while staying employed and/or raising a family. It broadens the educational possibilities of nontraditional students.

Research indicates that students who choose to pursue higher education courses online do so because they have a need to do so.^{15, 17, 19, 20} In surveying the literature on this topic, the reasons students choose online learning has consistently been most often attributed to the following motivating factors:¹⁵

- Necessity
 - including geographical distance from a face- to-face alternative ²⁰
 - demands of work and family life ⁹
 - no face-to-face offering available that fits their current needs ^{16, 17}
- Convenience and Flexibility
 - including the ability to schedule course work around the demands of work ¹⁷ and family life ¹⁸
 - the ability to pursue a degree while working full time ¹⁵
 - avoiding the difficulty ¹⁷ and expense of commuting to campus ²¹

The demands of work/family and distance from an appropriate face-to-face offering were the common root causes between students motivated by either necessity or convenience/flexibility. In essence, the students needed educational convenience and flexibility because of life circumstances. Dutton, et al, provide evidence of this in their study comparing online to on-campus students: “The two greatest responsibilities that [the online] students are likely to have outside of class are work and childcare” leading them to the conclusion that “on average, students taking the online section have greater outside responsibilities and that they live farther from campus.”²⁰ When discussing these very same needs driving choices among online learners, the *2014-15 National Online Learners Priorities Report* summarized findings by stating “Convenience, flexible pacing, and work schedule are the consistent top three enrollment factors. Online learners clearly require their courses to fit into their lives and to allow them to participate when it is convenient for the student.”¹⁸

Prior to an increasing availability of quality online higher education alternatives, nontraditional students were an underserved population who were often forced to choose not to pursue higher education. This very point was illustrated in a paper by Kinney et al, which examined faculty and student perceptions of online learning in engineering education, stating “As student demographics have changed, many colleges and universities have employed various distance education strategies to expand their offerings to ‘non-traditional’ markets, including students that are older, married or with families, or working part- or full-time. Due to these various demands, many of these students are not able to attend on-campus courses during regular course times. They require flexibility in time and place, and institutions are working to address these needs by offering courses online.”²²

It seems that nontraditional students at different life stages are drawn to online programs. The age of the average online college student is quite unique when compared to the typical traditional undergraduate college student. Clinefelter and Aslanian revealed in the annual report *Online College Students 2016: Comprehensive data on demands and preferences* that the average age of online undergraduate students in 2016 was 29 and in graduate courses was 33.²³

Older students are driven online due to work and family constraints that emerge as we age. Students are not choosing online education as a desired format out of anything more than necessity. In person programs are the default educational choice. Although many traditional undergraduates are taking a course or two online during their degrees, these are not fully online programs. Far more often not, traditional undergraduate students will choose to take higher education courses face-to-face in a classroom. The need to offer high quality face-to-face classroom instruction for traditional undergraduate students does and will remain strong even though formerly underserved populations are pursuing higher education via online learning in increasingly larger numbers every year. As Jaggars noted in *Choosing Between Online and Face-to-Face Courses*: “To meet students’ needs then, colleges need to... continue to provide ample face-to-face sections of courses for those students who prefer them.”¹⁹

A very recent analysis of Georgia Tech’s online master’s in computer science further illustrates this point. “People thought they were crazy...They thought that Georgia Tech was going to

cannibalize its own revenue stream. But the profile of people applying online is so different, there's virtually no overlap."^{24, 25} The study found that the school brought access to education to those who would otherwise be unable to attend graduate school, with no effects on traditional graduate enrollment. "Analyzing the first six cohorts of the online program, from spring 2014 to fall 2016, the report found that the typical applicant to the online program was a 34-year-old midcareer American, while the typical applicant to the in-person degree was a 24-year-old recent graduate from India."^{24, 25}

Why student choose to enroll in face-to-face programs

It is clear that nontraditional students may choose online programs because of geographic or time constraints. However, traditional undergraduates do not carry the same life constraints that may drive nontraditional students into online programs. Traditional undergraduates are less likely to be burdened by careers and family and more likely to be free to seek out in-person programs almost anywhere. The decision factors for undergraduates selecting in-person programs are not at all based on convenience.

Although a 2012 national survey revealed that the top reasons first year undergraduate college students choose to attend college is to get a better job and make more money,²⁶ data from the past year showed that undergraduate students were increasingly attending college to pursue interests and ideas.²⁷ When it comes to actually selecting a school, campus visits play an increasing role in the selection process for first-year students.²⁷ Since first-year undergraduate students can not visit online schools in-person, they may be less likely to consider them as an option. Other factors which influence a student's ultimate choice in university include the availability of a specific major, affordability of the institution, positive campus visits, reputation/perception of the school, size/location, campus aesthetics, and a welcoming/friendly campus.²⁸

Like all economic decisions, cost is a factor in college selection. In fact, the cost of a particular college has been shown to be a rising concern for first-year students.²⁷ As a result, more first-year students are attending colleges near their homes and almost one-fifth of incoming first-year students plan to live with relatives during the first year of college. The impact of cost on college decision is especially important for first-generation college students. Despite the fact that these students are accepted to their first choice institutions at similar rates as their peers, first generation students are less likely to attend a first choice institution.²⁷ In addition to financial pressures, first generation college students have been found to have more limited college choice decisions due to complicated family relationships and less overall geographic mobility.²⁹ In fact, some families can place financial burdens on students. One national survey of first year college students revealed that 22.4% occasionally contribute money to support their families, with 6.5% frequent contributors.³⁰ Research has shown that race greatly determines whether a student is likely to be offering financial support to their family, with 48.2% of hispanics, 44.3% of African Americans, 29.2% of Asians and 22.1% of Caucasians contributing financially to their families.³⁰

Buyer behavior models have been applied to potential undergraduate students selecting among college choices. Within consumer decision frameworks, potential students have a set of schools of which they are aware (awareness set) from which they determine some for consideration

(consideration set) and ultimate college choice. The first-year student college choice literature surveyed specifically focused on in-person institutions.²⁶⁻³⁰ In fact, the availability of online course offerings was not discussed as a selection criteria for first-year college students. Online programs are not mentioned as a part of the selection process because they are not in the consideration set. The lack of consideration of the availability of online course offerings during the college selection process of high school students implies that traditional first year students are seeking an in person experience.

Stephenson, Heckert and Yerger interviewed first year students at a mid-sized public university in the northeast U.S. to determine what factors influence the determination of a consideration set and ultimate university selection.²⁸ On average, students were choosing between three schools in their consideration set, usually a mix of public and private institutions of varying sizes. Students indicated that having family or friends who had attended the school positively affected their ultimate decision to attend, “allud(ing) to a level of comfort and familiarity with the school based on their friends’ and family’s experiences”.²⁸ In fact, a study comparing SAT takers in 2004-2011 found that “many younger siblings apply to and enroll in the same college of their older siblings”.³¹ This study also found that influence of sibling college choice was not found to vary much by race, income or proximity to public four-year colleges. Additionally, younger siblings who were more like their older siblings (with regards to gender, age and academic abilities) were more likely to follow their older siblings’ college choices.

Although some populations of nontraditional undergraduates may need online education (due to being place bound by military service or life stage), traditional undergraduates students are less likely to have the geographic and time restrictions (work and families) which attract students to online programs. These traditional students are selecting in-person programs based on cost, availability of majors, the reputation of a school, influence and opinion of friends and family, and their experience and impression of campuses, among other factors.²⁶⁻³⁰ Online course offerings are not part of the decision factors for traditional undergraduate students. This is not surprising, considering the desire of young people to be among peers. The first-year college experience provides many with their first opportunity to be on their own in the world, making new friends and dating. Students meet people from different geographies and world views. The online environment would not provide the immersive cultural experience that in-person education provides.

What students value about in person education

Despite the growing number of online students, these programs are not valued for the same reasons as traditional education. Online students choose the format for convenience, which is not only their main selection criteria, but also what they most highly value about online education. Traditional in person undergraduates value very different things about their classroom experience, and convenience is not among them. A previous open-ended survey by one of the authors asked 38 engineering technology students enrolled in an in-person undergraduate program, what they value about both online and in person education.¹⁷ The top three things that the students valued about in person education were: direct contact with the professor; classroom discussions and debates; and human interaction. These students also mentioned they felt it was just plain easier to understand the material in person, and that in person classes motivated them

to do work. Some students also perceived more hands-on learning opportunities in traditional classrooms.

From a student perspective, interactions are key to a quality in-person educational experience, including interactions with each other and the instructor. The instructors themselves shepherd students through classroom interactions. As a result, the skills of the professors themselves are often a major part of what students value within in-person education. Hill et al, (2003) conducted six focus groups to ask nursing students about what quality education means to them.³² Several main themes emerged including (in order of importance): quality of the lecturer, student engagement with learning, and social/emotional support systems. With regards to lecturer quality, students desired lecturers who were knowledgeable about the subject, organized and interesting, as well as those who were “easy to be with and helped them to learn.” Students also desired feedback from lecturers both on assignments and in the classroom. When it came to engaging student learning, students valued class materials which broaden their horizons, but were relatable to their chosen field. Finally, students valued support from their peers and university support systems. Ultimately, the authors’ of this study concluded that “it is the quality of the interaction that leads to the quality of the learning experience where lecturer/student and student/student relationships are the key.”³²

In another investigation of quality education, Trammell and Aldrich (2016) surveyed 132 students at a small midwestern university, asking them to rank essential (suggested) qualities in teachers on a Likert scale.³³ When it comes to professors themselves, students ranked all of the following qualities above a 4.3 on the scale (in decreasing order): approachability, strong teaching skills, knowledgeable about the course content, organized, positive outlook, consistent, enthusiastic, friendly, knowledgeable about technology, and quick responses to email/phone. Furthermore, the ranking of importance of these qualities was not found to be significantly different between first generation college students and their peers. Similarly, students taking 100 level classes did not differ significantly in their answers than students taking 400 level classes. These instructor qualities were held to be important to all students. Surprisingly, the quality “empathetic” only scored 2.64 on this scale.³³

A study by Arnon & Reichel (2007) asked education students open-ended questions regarding the ideal qualities of teachers.³⁴ Their results revealed that the ideal teacher possessed qualities which could be broken into two broad categories: the personality of the teacher and the professional knowledge of the teacher. Students valued personal qualities such as humor, kindness, calmness, fairness, and optimism. Students also valued teachers who were “empathetic and attentive to their pupils”, were authoritative leaders of their class, and seem to love teaching. Students’ ideal teachers would possess both a wide general knowledge as well as disciplinary knowledge. Ideal teachers should also have didactic knowledge in the field of education and a focus on students as individuals. It should be pointed out that this research was qualitative, examining general themes of what students value in an ideal teacher.³⁴ Although empathy was a quality mentioned among students’ perceptions of ideal teachers, it may be of comparatively low importance to the other qualities, as indicated by the work of Trammell and Aldrich (2016).³³

Overall, students value contact with quality instructors and classroom interactions which promote learning. Although online instructors may possess the qualities that students seek in educators, some believe the instructors' abilities to reach the students in a deep and meaningful way may be hampered by the distance format. Noonan and Coral (2013) assert that virtual environments work well for information transfer, but do not foster the in-depth human contact and social interaction required for quality education.³⁵ They provide the definition of education as "an interactive social process involving respectful challenges to authoritative opinion." Noonan and Coral argue that the cognitive growth process of education requires instructors to question students' assumptions and ideas through dialogue which requires co-presence in a physical place. They describe the educational process as a delicate "conflict" between instructors and students which depends on physical proximity and contact, arguing that "people respond differently, take things more seriously, when they *feel* the presence of others."³⁵

Noonan and Coral note that online programs typically advertise convenience to students, but ultimately fail to properly engage students, leaving them feeling detached from professors and courses. Although they maintain that only in-person education can truly lead to transformative education, they do concede that online content may be useful in face-to-face classes because it can free up class time for interaction and dialogue. Despite their criticisms of online discussions, Noonan and Coral concede that videos and textbooks may be best conveyed online, providing more class time for quality interactions.³⁵

It should be noted that asynchronous online programs are intentionally designed so that students can log on at any time of the day. The criticisms of Noonan and Coral for online programs assume asynchronous online classes. This format is necessary when students are enrolled overseas, such as active duty military or foreign nationals. However, not all online programs are designed without a real-time discussion. Some programs do require students to "attend" a virtual class discussion. Future research could investigate the impact of online class format (synchronous or asynchronous) on online student enrollment and satisfaction.

It is clear that students want to be engaged in their learning through quality instruction. Communication is richer in person, where individuals can hear each others' tone, see gestures and respond in real time. Classroom debates can flourish and instructors can probe and respond with greater agility in person. Furthermore, in-person programs also provide students with complete immersion in the educational experience, surrounded by peers who are also learning, questioning, and growing daily. It should be no surprise that traditional undergraduate students seek in-person education as the default educational format.

Conclusion

Enrollment is increasing for online programs.^{5,6} The demands of work and family create a need for the convenience and flexibility of online education and have consistently been shown to be the leading reasons why students choose online education.^{10, 15-21} The older age of online students,²³ when compared with traditional undergraduates, indicates that differences in life stage accounts for the needs of online students, who are more likely to have work and family obligations. In contrast, first year undergraduate students are comparatively more free to move geographies to obtain an education. In fact, when we examine the factors that influence school

selection for traditional undergraduate students, they are motivated by cost, availability of majors, campus visits, size/location of schools, and sibling choices.^{27-29, 31} Convenience and flexibility (the main driving forces for those who choose to study online) are not even mentioned among the college selection criteria of traditional first year undergraduates. For the institutions, as well as the students, it is clear that the default educational choice is in person and the online format is chosen for necessity and convenience. Even in-person programs select online classes when driven to do so by scheduling conflicts or limited space.³¹

Traditional undergraduate students value contact with quality instructors and each other.^{17, 32-34} Some also feel the best format for in-depth challenging dialogue required of education is in-person classes.²³ Some academics fear the trend in growing online classes, but students use this format out of necessity, not preference. Because of the irreplicable experience of direct human contact, the internet will not replace us.

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