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Higher education enrollment crisis: the importance of examining student's choice of modality

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Abstract

As a result of the health pandemic, the United States (U.S.) has experienced a labor shortage and a decrease in higher education retention and enrollment which has many educational institutions in a crisis mode as they rapidly search for guaranteed sustainable long-term student enrollment. Numerous research studies have explored students' viewpoints through surveys or focus groups to investigate their preferences regarding online or in-person courses. However, there has not been a research study that has examined the post pandemic registration process of student enrollment data over a traditional scheduling period to determine their unbiased preference in modality offerings. More specifically, when students are given a choice to enroll in an online or face-to-face course, which modality do they independently choose? Student enrollment data collected from a publicly accessible website starting from the first day for priority students and continuing throughout the entire registration period for business and technology courses. Results revealed a significant difference between student enrollment for online versus face-to-face courses

Keywords: enrollment crisis, learning modalities, online vs. traditional learning, post-pandemic

Introduction

The health pandemic has produced a tidal wave of effects on businesses, governments, higher education institutions, and individuals. Amid the post-pandemic surge, a higher education enrollment crisis is unfolding (Woo, 2021). Specifically, higher education student retention and the number of students applying to higher education institutions have dropped. As of May 2023, according to the National Student Clearinghouse Research Center (2023), post-secondary enrollment declined by 1.09 million undergraduates compared to pre-pandemic enrollment in the Spring semester of 2020. As a result, higher education institutions have growing concerns about retaining students who are currently enrolled. A question that should be raised at the administrative level to address student retention is the availability and choice of modalities for course offerings. Moreover, ensuring students have online course availability is an important option that can improve retention rates and attract new students.

Typically, traditional learning methods were widely accepted and used in public high schools and state higher education institutions before the emergence and spreading of COVID-19 (Salvaraj et al., 2021). To avoid the spread of COVID-19, 188 countries in the world shut down all schools or localized them in some cases, thus creating a situation where the students could not go to school (Rebman, et al, 2021). Figure 1

(Basilaia & Kvavadze, 2020) illustrates the worldwide shutdown, estimated to have affected 91.3% of the world's student population. As a result, educational institutions across the nation transitioned from traditional face-to-face methods to online to ensure continuity of learning (Rebman et al., 2022). Thus, it was the first time in U.S. history that online learning was being deployed on such a grand scale.

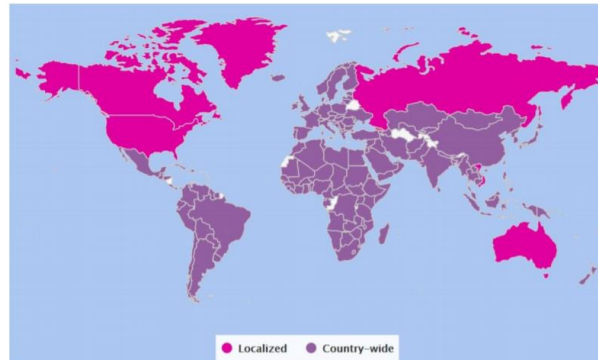


Figure 1: Countries that have shut down or localized schools in the world UNESCO Report

The quick shift to online learning brought about many challenges, including, but not limited to, internet, technical, and technology difficulties (Salvaraj et al., 2021; Rebman, et al 2021), as well as teaching, learning, and disability accessibility difficulties. Thus, speculation arose that students' online learning experiences and challenges led to the decline in students entering and continuing college studies and what is to be an enrollment crisis in higher education. Many current research studies have been deployed to assess this preferred learning modality choice during and after COVID-19 (Wang et al., 2022). However, most of these studies utilized a survey to determine students' online learning experience and current choice of modality.

Surveys can produce biased results. Specifically, a nonresponse bias or skewed population representation can occur when individuals who choose not to participate in the survey differ fundamentally from those who do respond. Additionally, a response bias can occur with surveys when respondents provide inaccurate or socially desirable answers instead of the participant's genuine opinions. Finally, question order or the framing of questions can also influence the respondent's answer (Johnson et al., 2018; Smith et al., 2017).

This study aims to examine students' choice of modality via their individual actions through actual course registration and enrollment data. Specifically, this study seeks to expand upon existing literature via a different methodology for examining student choice of modality in higher education. The rest of this paper is structured as follows. First is a brief literature review, followed by our research question/purpose, methodology, results, and conclusion.

Brief Review of Literature

Enrollment Crisis

The health pandemic helped to change the mindset of many college-age students who were once interested in attending college (Weber, 2023). The shutdown of high schools and immediate move to an online format left many first-generation college-ready students without the support and guidance of a counselor to aid in their college admissions process (Binkley & the Associated Press, 2023) or internet access to complete the college application (Smith & Johnson, 2021). The travel restrictions among states also limited the number

of students able to physically visit some of the prospective students' first-choice universities, resulting in a decline in applications (Johnson, 2021). Additionally, the slowed supply chain, economic distress, and financial uncertainty left many students concerned about going into debt for college (Pew, 2021; Weber, 2023). At the same time, lawmakers in Pennsylvania and Utah changed numerous job criteria that previously mandated a college degree to no longer be required (Milligan & Camera, 2023; Weber, 2023).

It is well known that an enrollment crisis already existed before the COVID-19 pandemic. Grawe (2018) wrote about the looming conditions of student enrollment and how critical decision-making was needed to determine an institution's viability. With that said, Spring of 2020, the world was in fear due to COVID-19, and decision-making would have long-lasting implications for our education systems. Snowden (2020) wrote about this and understood the responsibility of administration and academic leaders, suggesting a complete understanding of the impact of the COVID-19 pandemic and that there was no immediate remedy for what lay ahead. Further, this was the time to understand the purpose of education and its resolve in the student's perceptions.

Post-COVID-19, there has been a steep decline in enrollment and student attitudes have changed. Binkley (2023) acknowledged that the prediction of enrollment numbers rising post-COVID-19 has yet to happen. Moreover, there is a sentiment that college-aged students see less value in a college degree and instead recognize the expense. Even when students enroll, this enrollment is not guaranteed (Davos, 2023).

Today, enrollment management has changed to data-driven practices led by C-suite administration funneling to a provost or president (Snowden, 2020). Unfortunately, enrollment practices tend to establish benchmark numbers as an indicator of success instead of student satisfaction. Achieving student satisfaction may be a complex process but, is it?

The culmination of the significant changes discussed, along with a decreasing population of college-age students, is leading many higher education institutions toward a catastrophic enrollment crisis (Weber, 2023). Specifically, the enrollment crisis is particularly palpable for many public or state universities that lack large endowments and private funding. Notably, it is reported that the Pennsylvania State System for Higher Education (PASSHE) is aware of an expected enrollment crisis forthcoming within the undergraduate education sector (Leigh, 2023).

Addressing the Enrollment Crisis

To address the enrollment crisis, colleges have implemented various strategies, including increased financial aid and scholarship opportunities to alleviate financial burdens (Adams & Brown, 2021), creative, flexible admission policies and alternative pathways to apply to college (Johnson, 2021), and enhanced support services (Adams & Brown, 2021; Ramirez & Hernandez, 2020). Additionally, a study by Ramirez and Hernandez (2020) highlighted the importance of proactive and personalized support services in addressing the enrollment crisis by ensuring student success, persistence, and satisfaction. It is crucial to note that student satisfaction plays a pivotal role in overall student success, retention, and enrollment. Furthermore, course delivery modality can substantially impact student satisfaction and retention (Woo, 2021).

A review of the literature regarding students' perception of online versus face-to-face course preference yields various studies pre, during, and post-COVID-19 particularly severe. Examining data during the COVID-19 pandemic was imperative but, Hodges et al. (2020) notes that online teaching during COVID-19 should be viewed as "emergency remote teaching" because it was an unplanned and temporary offered to continue learning in unprecedented times (para. 5). Thus, many of the emergency remote learning

offerings may not have utilized or embraced quality pedagogical elements of an online course delivery. Thus, studies conducted on preferred course modality modes during COVID-19 may have a skewed perception of online learning.

A recent study by Wang et al. (2022) surveyed students' perceptions of online and face-to-face learning toward the post of the pandemic from April 2021 to May 2022. Specifically, the researchers created a 34 closed-ended question survey which was administered to students enrolled in computer information systems (CIS) courses in a northeastern U.S. private university. The researchers found that students sought online courses during the pandemic for preference of course enrollment modality. However, as COVID-19 restrictions began to decrease, there was a more sizeable preference for non-online courses. Interestingly, Wang et al.'s study also found that selection for non-online courses was unrelated to students' perceived effectiveness, the usefulness of classroom interaction, or self-skills. In parallel with recent psychological studies by Groarke et al. (2021) and Ramachandran (2021) suggested that students' interest in not wanting online courses may be from their loneliness during the pandemic or Zoom fatigue.

Researchers such as Wang et al. (2022) and multiple research studies (Castro and Geroge, 2021; McKenzie, 2021; Lederman, 2020; Pinkus, 2020; Leboff, 2020; & OneClass, 2020) examined students' perceptions regarding face-to-face versus online classes were noted throughout the literature. However, each of the studies cited utilized a survey instrument to examine students' perceptions of online versus face-to-face learning modalities. While these studies provided insight into student perceptions, they lacked the analysis of the actual student registration or enrollment data.

Moreover, an extensive dissertation by Woo (2021) collected five years of data on 5,041 students enrolled in 88 computing courses. Specifically, she examined the retention rates of online, hybrid, and traditional face-to-face courses before and at the start of COVID-19. Results showed that a significant difference existed between the retention rates of online and traditional face-to-face courses. Specifically, traditional courses had a higher success rate. As a result, she concluded that "course delivery mode can affect student satisfaction" (p. 3). Thus, courses that prioritize student retention have the potential to yield student success, retention, and increased enrollment. While this study is limited to extensive data prior to COVID-19, it provides a helpful perspective for higher education institutions because it looks at course enrollment data rather than surveying students.

Finally, although an abundance of previous research seems to skew toward face-to-face learning modalities as a positive learning experience, why are enrollment numbers and retention increasingly dropping and even more so post-COVID-19? For many institutions, the goal is to obtain students out of high school and then track sentiment with surveys. Does this method reveal the gaps that need to be addressed? Moreover, does this align with the current educational landscape? Data from the Lumina Foundation (2023) found that 37% of college students are 25 and older, and most work, 64% in some compacity to support themselves through school. Additionally, 49% are financially independent from their parents. Subsequently, a report by Chegg (2022) found that flexibility and self-paced courses were needed besides a cost-effective education. Developing student-centered online self-paced courses can give today's students the flexibility they seek to succeed in their education and personal life. If this is the case, why are we not comparing and contrasting the course numbers for nothing more than enrollment numbers?

Research Goal/Purpose

The goal of this study is to expand upon existing literature via a different methodology for examining student choice of modality in higher education. Specifically, this study examines students' choice of modality via their individual actions through actual course registration and enrollment data.

Methodology

Public course registration data for business and information technology-related courses were collected from a public website of a state university in Pennsylvania for Fall 2022 and Spring 2023. Table 1 provides descriptive data regarding the university. The data listed in table 1 pulled from the university's Institutional Research website which was publically available online.

Table 1: University Undergraduate Data

Data Description	Fall 2022	Spring 2023
Out of State students	618	586
Part-time students	761	940
Full-time Students	6,043	5,317
Gender: Female	4,125	3,819
Gender: Male	2,679	2,438
Commuter	4,127	3,829
Lives on-Campus	2,667	2,428
Enrollment	6,804	6,257

Additionally, it is important to note that the university's face-to-face course caps are based upon the number of actual seats available within the actually classroom. Thus, face-to-face caps can not be increased without moving the courses to larger room. However, online caps may be increased.

Data were collected weekly on course enrollment and saved as a PDF. The PDF file was then imported into Microsoft Excel (Excel). Within Excel the data was filtered, and cleaned to only include business and technology courses. Next, the data was further filtered to only include courses in which the same instructor was teaching the same online and face-to-face course but just a different section. Thus, this helped to eliminate instructor preference which could skew the results. A total of 36 courses and 80-course sections were examined within the business and computing discipline.

Excel and SPSS were used to analyse the data. Specifically, Excel was used to find percentages and sum the dataset. SPSS was used to compute descriptive statistics including mean, and standard deviation. Additionally SPSS was used to perform a t-test which analyzed the course enrollment numbers between online and face to face courses.

Results

Results revealed a significant difference ($p=.006$) between the enrollment of online and face-to-face courses with the same instructor for combined Fall 2022 and Spring 2023 data. Overall, face-to-face enrollment was less than online course enrollment. Additionally, because data was collected weekly, the rate at which the courses filled was also calculated. Specifically, 98% of the time, online courses consistently had higher enrollment numbers throughout the entire registration period. Thus, students were registering for an online courses when seats were available within an actual face-to-face section

As listed in Table 2, the mean enrollment size was 32.74 for online courses and 30.42 for face-to-face courses. Section cap sizes for online and face-to-face courses were the same or slightly varied by two extra seats for online courses. Thus, 76% of the courses offered with the same instructor had a higher enrollment in the online section, approximately 6% had the same enrollment class enrollment, and only 18% had higher face-to-face enrollment. Additionally, in the Fall of 2022, 68% of the online courses taught by the same

instructor were filled with enrollment greater or equal enrollment to the course cap. Meanwhile, only 42% of the face-to-face courses taught by the same instructor filled with enrollment greater or equal to the course cap. Thus, results illustrate that based on course enrollment data of course offerings with the exact same instructor for both the online and face-to-face sections, online courses have higher enrollment and are more likely to be full. Therefore, it can be concluded that in the Fall of 2022, course enrollment data indicated that students prefer online courses more than face-to-face courses.

Table 2: Descriptive Statistics for Fall 2022 Enrollment Data

Teaching Modality	N (Number of Courses)	Mean Enrollment
Online	19	32.74
Face-to-Face	19	30.42

Similar results also occurred during the Spring 2023 course scheduling as the overall online enrollment was greater than face-to-face course enrollment. Table 3 lists the mean enrollment size of 37.05 for online courses and 30.73 for face-to-face courses. Tables 4 and 5 contain the overall enrollment data for Fall 2022 and Spring 2023 semesters. Section cap sizes for online and face-to-face courses also differed in regards to online courses. Thus, 100 courses offered with the same instructor had a higher enrollment in the online section. Additionally, 85% of the online courses taught by the same instructor filled with enrollment greater or equal enrollment to the course cap. Meanwhile, only 41% of the enrollment for face-to-face courses was greater than or equal to the course enrollment cap. Therefore, these results also conclude that a higher number of students enrolled in online courses with the same teacher for both an online and a face-to-face course.

Table 3: Descriptive Statistics for Spring 2023 Enrollment Data

Teaching Modality	N (Number of Courses)	Mean Enrollment
Online	20	37.05
Face-to-Face	22	30.73

Table 4: Fall 2022 Enrollment Data

Modality	Discipline	Mean	N (Courses)	Std. Deviation
Face-to-Face	ECON	34.29	7	9.69
	FINA	36.00	1	0.00
	ITA	27.33	3	8.33
	MGMT	27.50	8	6.16
	Total	30.4211	19	8.17
Online	ECON	33.00	7	7.68
	FINA	33.00	1	0.00
	ITA	34.50	2	6.36
	MGMT	32.11	9	1.96
	Total	32.74	19	4.92
Total	ECON	33.64	14	8.43
	FINA	34.50	2	2.12
	ITA	30.20	5	7.76
	MGMT	29.94	17	4.91
	Total	31.58	38	6.76

Table 5: Spring 2023 Enrollment Data

Modality	Discipline	Mean	N (Courses)	Std. Deviation
Face-to-Face	ACCT	34.00	2	0.00
	BUSE	24.00	1	0.00
	ECON	33.50	4	7.00
	FINA	34.20	5	14.96
	ITA	30.00	2	5.66
	MGMT	27.38	8	4.27
	Total	30.73	22	8.31
Online	ACCT	34.00	1	0.00
	BUSE	36.00	1	0.00
	ECON	35.25	4	6.65
	FINA	40.25	4	9.11
	ITA	39.00	2	1.41
	MGMT	36.38	8	2.92
	Total	37.05	20	5.23
Total	ACCT	34.00	3	0.00
	BUSE	30.00	2	8.49
	ECON	34.38	8	6.39
	FINA	36.89	9	12.37
	ITA	34.50	4	6.19
	MGMT	31.88	16	5.84
	Total	33.74	42	7.63

Conclusion

This research study sought to expand upon the existing literature by deploying a different methodology for examining student choice of modality in higher education. Specifically, this study examined students' choice of modality via undergraduate student enrollment data. The results provide practical impacts for universities, colleges, program development, and faculty looking to help aid in student satisfaction by offering courses with the preferred student modality in hopes of retaining and attracting students to the university. Thus, this research can lend itself to further the discussion by providing another step toward a larger mitigation strategy to address the enrollment crisis in higher education.

It is important to note that this study is not without limitations. Limitations include a small sample of data limited to one state higher education institution. Different results may occur within private universities. Second, the data set is further limited to a geographical location of Pennsylvania. Other areas throughout the U.S. may be progressive in their responses. Third, this study only examined courses taught by the same instructor in both modes. A possible limitation may be that the instructor might be using the online materials for the face-to-face course leading the students to question the value of coming to the classroom.

Future research should address the limitations described, reevaluate the content as needed, and evaluate the situation with a campus-wide lens. Future research could examine whether high tech type courses skew

the results, as well as to delve into more of students' preferences in course modality, and course offerings should be tracked to better understand if a lack or a reduction of online course offerings could be a cause for enrollment concerns.

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