

How has COVID-19 affected ECU Applications, Admissions, and Enrollment?

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Introduction

Beginning in March 2020, the world experienced a global pandemic that changed life as we all knew it. From quarantine, wearing masks out in public, anticipating a vaccine, and businesses having to shut down indefinitely, the overall economic and societal effects were huge. In addition, in most places, the education system had to close in-person teaching and move to all virtual learning. This affected the K-12 education system along with public and private universities across the nation. Specific to universities, many physical campuses closed, changing the nature of learning, teaching, campus life, and recruiting prospective students to attend college. Along with all learning being moved online, “school closures resulted in the cancellation of May and June administrations of the SAT in 2020, as well as the April administration of the ACT” (Camara, 2020). This affected the availability of test scores to be sent to universities by these prospective students, which in turn contributed to universities reviewing and in many cases revising their overall admissions processes.

With these large changes and uncertainty of the future, admissions and enrollment numbers were expected to decline, in addition to changes of the expectations and requirements of applicants. My project strives to explore how admissions has changed through the COVID pandemic at ECU regarding application, admitted and enrolled numbers, average GPA and standardized test scores. Lastly, in an attempt to examine whether COVID was the driver of the changes we see, I use NC county data to examine whether these changes are more pronounced in counties with higher-than-median COVID cases.

Literature

I focused on finding scholarly articles that discussed the changes that COVID-19 had brought to different aspects of college life. First, many colleges are feeling uncertain on how to progress moving forward regarding COVID-19, whether it be through overall college structure, virtual accessibility, budget, etc. College budgets specifically are changing in response to COVID-19. Areas highlighted as losses from COVID-19 include room-and-board, decreased revenue from executive education, spring sports seasons, dining, parking and other auxiliary services, as stated in The Chronicle Review source, “Under COVID-19, University Budgets Like We’ve Never Seen Before” (Friga, 2020). In creating the fall ‘21 budget, the previous budget is essentially useless due to the unique changes that had to be made to adjust to COVID. Newer budgets will all be based around COVID and the consequences the universities suffered from it.

Even with these many changes upcoming regarding budget and college life, 86% of college presidents have put 2020 enrollment as their top concern of COVID-19 as stated in the resource “COVID-19 and US higher education enrollment: Preparing leaders for the fall” (Kim, Krishnan, Law, et al., 2020). However enrollment numbers continued to remain mostly unchanged with only a 1% decrease due to optimism of classes going back in person (surveyed May 2020). In a survey by McKinsey (COVID-19 Higher Education Enrollment Survey: Wave I, conducted April 21–28, 2020) first choices are changing for students. 44% wanted to attend of school with lower tuition, 30% wanted to be closer to home, and 26% wanted to avoid a covid hotspot. COVID has affected students’ (45%) preparedness for school, their mental health, and their overall confidence in performing well in college courses. Remote learning is also causing uncertainty in students, with only 23% saying they are confident they can receive a strong education from online learning and 19% feeling they can build strong relationships through

online learning (Kim, Krishnan, Law, et al., 2020). Also, nearly half of students report they are very likely to change their plans, leading enormous uncertainty for universities. Reasons include doubts of quality of remote learning, lack of campus experience, and the costs when instruction is entirely or majority online. 83% of students reported expecting a tuition discount if there is a remote semester. Further, challenges of remote learning are not distributed equally. Lower income families face more struggles in comparison to higher income counterparts due to a lack of resources and internet access (Kim, Krishnan, Law, et al., 2020).

This same study found that if enrollment numbers decline by 20%, universities across the country will lose up to \$19 billion in revenue from tuition and other lost revenue sources (Kim, Krishnan, Law, et al., 2020). However, there are many other factors that have an impact on how much money would be lost per individual university (if a school relies more on undergraduate vs graduate students, their online education quality, reliance on out of state vs in state students, etc.). Moving forward, communication with students is the highest priority, and providing virtual events to better communicate and provide an environment for students is critical. Mental health resources should also be made more accessible, in addition to financial aid packages and internet resources for students (Kim, Krishnan, Law, et al., 2020).

A major part of applications that was affected was the submission of ACT and SAT scoring. Due to COVID, many testing centers had to close down due to bans on large scale gatherings, which are necessary for in-person standardized testing. With standardized testing centers closed along with schools, the admissions process had to adjust given these barriers. While making these adjustments, there were many different factors that had to be taken into account, such as if there would be a second wave of the pandemic, the attitudes of parents/students on returning to in-person instruction, the vaccine timeline, and testing options

for standardized tests. One option for taking standardized exams is remote testing and proctoring, however there can be issues with recording and internet bandwidth. In a different regard, graduate school and professional schools run into more issues with guidelines and rules for remote testing with more intense exams and longer exam times. Criticisms of remote test-taking include inequality issues (it is more difficult for lower income students to access the resources to take them), the overall validity of test scores, and virtual limitations such as lack of wifi access/technology.

With these problems regarding remote testing and lack of open testing centers, “over 150 colleges have adopted a test option policy (rather than requirement) for 2021 or beyond given COVID-19” (Camara, 2020). But, if colleges are going forward with waiving SAT and ACT scores, is there even a point to continue offering as much testing? COVID is affecting demand for in-person exams, how colleges and schools operate in-person to virtual, innovation of education technology, and standardized testing as a whole. In the Enrollment Management Report, the Pearson Global Learner Survey surveyed 7,000 people and found that “three out of every four global learners believe that COVID-19 has fundamentally changed higher learning as we know it and it is unlikely that there will be a return to a pre-COVID world” (Dennis, 2021). This report mentions five main areas that the pandemic is set to change higher education: beginning with online learning, alternative education providers, recruitment of students, the academic calendar, and mental health services. Regarding online learning, COVID created a new normal based around remote instruction on a large-scale basis. Even when the pandemic is over, online education is believed to be here to stay and something that will continue to grow. Online education was already growing prior to COVID, but since the pandemic the growth has been amplified. Education can be offered in 4 different ways: 100% online, as a hybrid, individual

online courses, and massive open online courses, according to the Enrollment Management Report (Dennis, 2021). These online courses allow for more flexibility among students, granted they have the resources to access them. Recruitment of students have also begun to go more towards virtual resources, with campuses giving tours online and meetings being held through Zoom calls. In addition, the academic calendar has become more flexible and “students will be accepted and admitted throughout the year” (Dennis, 2021) rather than one specific time period as before. Lastly, mental health has been valued more since the pandemic by universities, with “more than half of students worldwide, and three-quarters of U.S. students, reported their mental health suffered during the past year” according to the Enrollment Management Report (Dennis, 2021). Despite these changes, it is clear that online learning isn’t always the best choice for an individual, especially depending on their learning style and constraints. Positives stated by the Journal of Information Technology Case and Application Research include flexibility, information accessibility, global reach, equity, innovation, and efficiency (Xie, Siau, Nah, 2020). Potential downsides stated include network instability and technological constraints, lack of sense of belonging and connectedness, presence of distractions, and lack of engagement (Xie, Siau, Nah, 2020).

Even while COVID-19 affected undergraduate education from four-year universities, other post-secondary options such as doctorate programs and community colleges were also affected. Community colleges were hit especially hard by the COVID pandemic, “causing a decrease in enrollment numbers and overall student persistence” according to the article “Recent research shows dismal outcome for community college enrollment after COVID-19” (Sutton, 2021). Normally, a decrease in enrollment numbers in community colleges is accompanied by a spike in higher education enrollment numbers. Further the pandemic-driven increases in

unemployment may also cause higher education enrollment numbers due to less individuals having jobs and so opting for more education/training. With this different kind of trend, it was more difficult to predict future numbers. According to the article “Recent research shows dismal outcome for community college enrollment after COVID-19,” “community college students who enrolled in the fall were more likely to express a desire to earn a four-year college versus their peers who either considered enrolling or did enroll in the spring 2020” (Sutton, 2021). Student income plays the biggest role in student persistence. In addition, “community college students are canceling their higher education plans at twice the rate of students in 4-year universities” and “40% are canceling community college plans” (Sutton, 2021). Specifically relating to medical school however, due to the COVID pandemic, there is more demand for medical personnel, but premedical students are facing more obstacles when applying to medical school. There are no longer as many in-person labs, reduced face to face interactions, lack of experience in shadowing/internships, and changes to the MCAT. According to “The Impact of COVID-19 Pandemic on Medical School Admissions: Challenges and Solutions” article, “The spread of COVID-19 brought about the closure of all MCAT testing centers across the country during this peak time” (Dowd, McKenney, Elkbuli, 2021). The MCAT has been shortened, but will still cover all the original 4 sections with the same level of difficulty. With core science classes being moved to majority online, students are struggling to understand their materials and receive the necessary help/instruction they need. Volunteering and shadowing opportunities have been canceled due to COVID, which is imperative to a medical student’s success and understanding of the medical community.

Research Questions

There were three broad questions guiding the analysis that follow. First, how have admissions, acceptance, and enrollment numbers changed through the advent of the COVID pandemic? With remote learning, many students felt uncertainty towards virtual university enrollment and the tuition costs associated with it, especially along with the loss of income many have endured through the pandemic, all suggesting that application, acceptance, and enrollment may decline during this period. However, with testing centers also being shut down, many universities decided to waive the SAT/ACT requirement along with the overall application fee. These factors, and more students having access to college education due to the virtual settings, could lead to a rise in numbers.

Guided in large part by SAT/ACT requirement changes, the second question asked in this paper is how the credentials of the average applicant and accepted student have changed during the COVID pandemic (GPA, standardized test scores, etc.). Universities have had to make changes regarding test score requirements, and it will be important to compare how these scores and GPAs of applicants have potentially changed pre/post pandemic. Lastly, as the first analysis cannot clearly tie changes in admissions numbers and test scores to COVID impacts, I wanted to examine if I can more directly identify COVID intensity as a factor driving the changes we observe in the pre/post COVID data. I do this by combining county-level COVID data with our admissions data. With infection numbers being different in each county in North Carolina, it could potentially show a pattern in applications, acceptance, and enrollment between the most and least COVID-affected NC counties before and after COVID.

Data

The majority of the data I used to conduct my analysis was acquired from the ECU Admissions Office. The data covers all admissions applications started from the year 2017 through 2020 (meaning applicants whose starting semesters are Fall 2018-Fall 2021). The variables in the admissions data include the semester and year they applied, their county of residency, their residency status (out of state or in-state), indicator variables for whether they completed the application, were admitted, and if they enrolled, their high school GPA, standardized test scores (SAT reading section score, SAT math section score, and ACT super score), and the standardized test that was their admissions decision indicator. Using SAS software, I created a variable indicating the socioeconomic tier within North Carolina for each applicant's county of residence. Along with the admissions data, I also merged it with data on cumulative COVID infections and deaths for NC counties specifically, acquired from a publicly available repository on Github. I then used census population data to create variables identifying cases and deaths per capita for each county as of March 15, 2020 (the deadline for applications for students looking to start at ECU in the Fall 2021 semester). I then split counties into higher exposure and lower exposure counties based on whether their cumulative infections per capita were above or below the median for the state.

Analysis

First, I ran a frequency test to see the numbers of completed applications, enrolled students, and admitted students from years 2017 to 2020. Specifically, the two most important years I am looking to analyze are 2018 and 2020, with 2018 being the last full year before

COVID and 2020 being the first full year after COVID. Comparing these two years will be the most significant in comparing admission numbers and data. When looking at all four years, there has been significant growth in completed applications from 2017 being 15,918, 2018 being 17,453, 2019 being 19,182, and 2020 being 20,308. Thus when comparing years 2018 and 2020, there has been a growth of applicants even with ECU being moved to virtual for the vast majority of the 2020-21 academic year. The number of admitted students has also increased over the course of the four years, and the years 2018 and 2020 have the highest percentage of admitted students out of the completed applications. In comparing 2018 and 2020, while applications and acceptances have increased markedly from 2018 to 2020, enrollments have been effectively flat between the two years. As seen throughout the sample consistently, numbers of 2020 and 2018 are more comparable to each other, while 2017 and 2019 are more comparable.

Table 1: Total Completed Applications, Admitted Applicants, and Enrolled Applicants

	2017	2018	2019	2020
Completed Application	15,918	17,453	19,182	20,308
Admitted	12,542 (79%)	14,338 (82%)	15,090 (79%)	17,857 (88%)
Enrolled	4,332 (27%)	4,137 (24%)	4,324 (23%)	4,148 (20%)

Notes: This table shows each total amount of completed applications, admitted applicants, and enrolled applicants in each year 2017 through 2020. The percentage values in the admitted and enrolled rows is the total admitted divided by the total sample of completed application per specific year.

Second, I ran a frequency test comparing in-state applications and out-of-state applications in years 2017 to 2020. Through 2017 to 2020, both in-state and out-of-state applications are rising. Over the course of 2017 to 2019, the percentage of application that are in-state saw a decline, decreasing from 80% to 69%. However, we saw a 4% increase between the years of 2019 and 2020 and the total number of in-state applicants go up. Conversely, out-of-state applications as a percentage of total applications was increasing between 2017 to 2019 with percentages going up from 20% to 31%. But out-of-state saw a 4% decrease between the years of 2019 and 2020. It is clear that out of state applications are rising faster in the 2017-19 period, but this trend flips in 2020, as the number of in-state applications shoots up. This relates to the idea that due to the pandemic and uncertainty of in-person learning, people are more likely to want to remain in-state rather than traveling out-of-state to attend a university.

Table 2: Total Applications for In-State Applicants and Out-of-State Applicants

	2017	2018	2019	2020
Residency In-State started application	12,370 (80%)	12,598 (72%)	13,343 (69%)	16,447 (73%)
Residency Out-of-State started application	3,188 (20%)	4,855 (28%)	5,885 (31%)	6,124 (27%)

Notes: This table shows the amount of In-State Applicants and Out-of-State Applicants who started an application in each year 2017 through 2020. The percentage amounts in each row show what percent out of the total sample per year were In-State and Out-of-State.

Regarding the three different test score sections and GPA, I ran a means test to calculate each mean value of the general sample in the years 2018 and 2020. Even though I had the data for the years 2017 and 2019, I ran the tests on 2018 and 2020 as those are the years that best illustrate the pre- and post-COVID periods. I calculated the mean values of the SAT math scores, SAT reading scores, ACT superscores, and GPA for years 2018 and 2020. Each mean has experienced a slight decline between the years of 2018 and 2020. This difference is statistically significant, with a p value of 0.00193408, 0.0000361806, 0.525996, and 0.00000 for the SAT math score, SAT reading score, ACT superscore, and GPA respectively.

Table 3: High School GPA, SAT Read Score, SAT Math Score, and ACT Superscore

		2017	2018	2019	2020
Average High School GPA	General Sample	3.72	3.78	3.65	3.66
	Admitted	3.88	3.92	3.76	3.77
	Enrolled	3.78	3.84	3.64	3.65
Average SAT Read Score	General Sample	552.45	561.84	566.38	558.46
	Admitted	571.21	577.28	579.68	567.45
	Enrolled	555.96	559.95	559.31	548.56
Average SAT Math Score	General Sample	543.37	553.42	558.79	550.47
	Admitted	562.55	569.64	572.92	560.12
	Enrolled	546.44	552.13	551.57	539.79

Average ACT Superscore	General Sample	21.71	22.02	22.16	21.98
	Admitted	22.84	23.03	23.00	22.70
	Enrolled	21.74	21.91	21.75	21.48

Notes: This table shows the average mean value of High School GPA, SAT Read Score, SAT Math Score, and ACT Superscore in each year 2017 through 2020. Each year has three sub-section per High School GPA, SAT Read Score, SAT Math Score, and ACT Superscore, showing the average for the General Sample, Admitted Sample, and Enrolled Sample.

In addition, I ran a means test on these four different score variables specifically in those who were admitted and those who were enrolled. In doing so, I found a similar trend with these smaller samples as I did with the general sample, with test scores and GPAs experiencing a slight decline and all have a statistically significant difference when comparing years 2018 to 2020. This declining of test scores and GPAs could be related to more lenience regarding the COVID pandemic. With all learning virtual and many testing centers/schools closed, it has potentially become more difficult to maintain a high GPA and receive standardized testing scores. However, even with testing centers being closed for COVID, more students than before still managed to use either the SAT or the ACT as their test decision indicator. 11,485 students used the SAT as their indicator in 2020, in comparison to 10,382 in 2018. While 8,725 students used the ACT as their indicator in 2020, in comparison to 6,959 in 2018.

Table 4: SAT and ACT Test Decision Indicator

	2017	2018	2019	2020
Test Decision SAT	8,512 (54%)	10,382 (60%)	10,807 (60%)	11,485 (56%)
Test Decision ACT	7,363 (46%)	6,959 (40%)	6,938 (39%)	8,725 (43%)
Test Decision Neither	27 (1%)	101 (<1%)	151 (1%)	144 (1%)

Notes: This table shows the total frequency of SAT and ACT test decision indicator for years 2017 through 2020.

To better examine whether COVID intensity affected some counties more than others, I merged the original data set with the county-level COVID data set, making new variables to better sort the data. I differentiate high risk counties, who have above-median levels of per-capita infections, low risk counties, who have below-median rates. After merging the two data sets in SAS, I was able to run frequency and means procedures on the data. I found that for low risk counties, 2759 applicants enrolled, while 7449 did not. While for high risk counties, 835 applicants enrolled, while 2214 applicants did not. When running the frequency procedure with the year being 2020, I found that for low risk counties, 2718 applicants enrolled, while 10765 did not. While for high risk counties, 809 applicants enrolled, while 3272 applicants did not. When comparing both years, low risk and high risk counties both saw a very slight decrease in enrolled students, low risk seeing a decrease of 41 and high risk seeing a decrease of 26.

Table 5: Applicants from Low and High Risk Counties Enrollment Decision

		2018	2020
Low Risk County	Did not enroll	7,449	10,765

	Did enroll	2,759	2,718
High Risk County	Did not enroll	2,214	3,272

	Did enroll	835	809

Notes: This table shows the amount of applicants from Low and High Risk Counties in the years 2018 and 2020, and their enrollment decision they made.

In addition to the frequency test, I also ran a means procedure to see how the average standardized test scores and GPA has changed between high risk and low risk counties applicants enrolled in years 2018 and 2020. For those enrolled in low risk counties in 2018, average GPA was 3.87, SAT reading score was 561.4, SAT math score was 555.39, and ACT score was 22.01. For students enrolled in high risk counties in 2018, average GPA was 4.0, SAT reading score was 554, SAT math score was 540.55, and ACT score was 21.51. For those enrolled in low risk counties in 2020, average GPA was 3.62, SAT reading score was 549.15, SAT math score was 543.82, and ACT score was 21.65. While for students enrolled in high risk counties in 2020, average GPA was 3.85, SAT reading score was 542.5, SAT math score was 526.77, and ACT score was 20.95. In all averages for all years in both counties, every section saw a considerable decrease in value. This analysis does not support the theory that test scores would decrease more in areas that experienced higher levels of COVID infections, as both low and high risk areas saw very similar decreases across the board.

Table 6: High School GPA and Test Scores for Low Risk Counties

		2018	2020
Average High School GPA for Low Risk Counties	Did not enroll _____	3.17	3.08
	Did enroll	4.02	3.8
Average SAT Read Score for Low Risk Counties	Did not enroll _____	483.44	478.63
	Did enroll	580.72	572.23
Average SAT Math Score for Low Risk Counties	Did not enroll _____	471.92	468.92
	Did enroll	575	568.64
Average ACT Superscore for Low Risk Counties	Did not enroll _____	17.4	16.97
	Did enroll	23.18	23.05

Notes: This table shows the average mean value of High School GPA, SAT Read Score, SAT Math Score, and ACT Superscore per applicant who did/did not enroll in Low Risk Counties.

Table 7: High School GPA and Test Scores for High Risk Counties

		2018	2020
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Average High School GPA for High Risk Counties	Did not enroll _____	3.34	3.18
	Did enroll	4.14	3.93
Average SAT Read Score for High Risk Counties	Did not enroll _____	462.59	463.06
	Did enroll	569.32	553.01
Average SAT Math Score for High Risk Counties	Did not enroll _____	453.06	444.12
	Did enroll	556.36	540.40
Average ACT Superscore for High Risk Counties	Did not enroll _____	16.59	16.08
	Did enroll	22.28	21.48

Notes: This table shows the average mean value of High School GPA, SAT Read Score, SAT Math Score, and ACT Superscore per applicant who did/did not enroll in High Risk Counties.

Conclusion

Throughout my research and data analysis, I was able to find different trends that supported that COVID-19 did have a potential effect on the enrollment numbers and admissions scores. However, due to there being many other outside factors affecting numbers, it is hard to draw a direct conclusion that COVID is the main reason behind these admissions changes. Overall, the number of total applicants have increased between the years 2018 and 2020, meaning COVID did not have a strong impact on decreasing applicants. Due to other application changes, such as

waiving the application fee and making overall education more accessible, this could've also contributed to an increase in applications. Regarding in-state vs out-of-state applicants, in-state saw a significant increase while out-of-state saw a decrease in comparing 2019 through 2020. This trend supports that COVID did lead to changes in applicants wanting to stay in the state they reside, rather than traveling out-of-state for college.

For testing scores and GPA averages, all saw a decreasing trend from the years 2018-2020. Though this may not be specifically COVID related, it could be attributed to more leniency towards test scores and testing due to virtual learning. When grouping counties based on COVID risk, both tiers (low and high risk) saw decreases in enrollment numbers, test scores, and GPA averages. One would expect that, if COVID was the driving force behind the fall in scores, that this fall might be larger in counties that experienced greater COVID number. The evidence does not support this. In addition to other aspects, COVID likely did have an impact on admissions and enrollment numbers, and will continue to lead to more changes in the higher education system/admissions process.

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