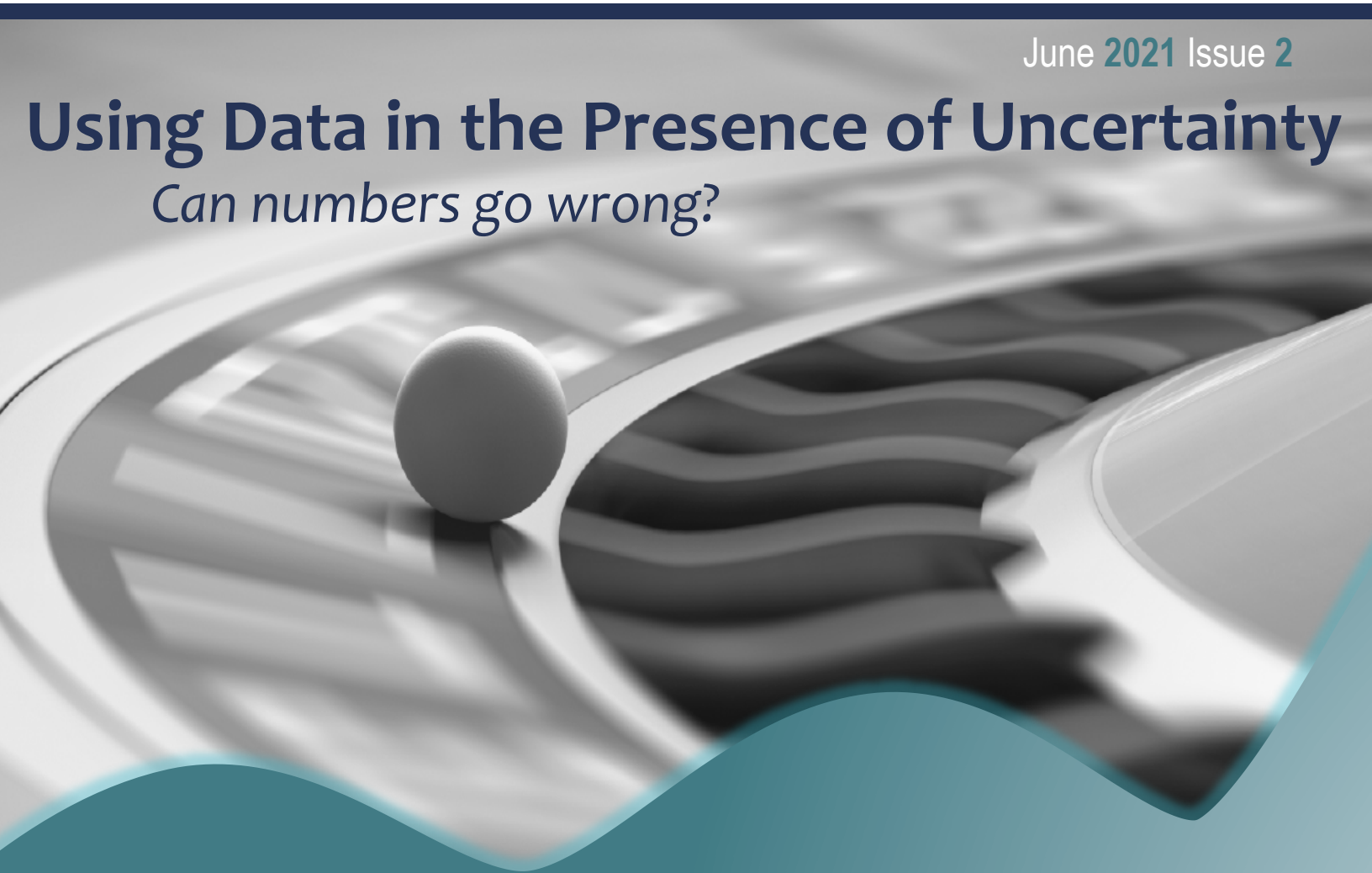
IR CORNER

June 2021 Issue 2

Using Data in the Presence of Uncertainty

Can numbers go wrong?



Lost in the Pandemic
Which groups of students returned at lower rates in 2020?

Online, Choose Your Time
Did outcomes differ between asynchronous and synchronous online sections?

TARRANT COUNTY COLLEGE
OFFICE OF INSTITUTIONAL RESEARCH
DIVISION OF INFORMATION TECHNOLOGY

IR OFFICE:

Robert Lorick
Interim Executive Director of IR

Kira Barrington
Asst. Executive Director of IR

Arjun Banjade
Director of State Reporting

Sarah Davis
Research Analyst

Bonnie Hurford
Lead Programmer Analyst

Sarah Mizher
Administrative Assistant

Elizabeth Northern
Research Analyst

Teresa Ray
Coordinator of State Reporting

Martin Salgado-Flores
Lead Statistical Analyst

Holly Stovall
Director of Research

In the Presence of Uncertainty

Holly Stovall

From varying 2020 election polls to widely differing projections for the number of COVID-19 cases, some may question how the numbers that defined 2020 could have been so 'wrong'. Unfortunately, information consumed through sound bites and character-limited tweets is often reduced and presented as news-worthy absolutes with no mention of limitations or implications of uncertainty.

In 2021, you are watching the beginning miles of the Olympic marathon when an app on your phone alerts you that the 2-hour mark is being broken. Should you be surprised when the winner's final time is not faster than this famous threshold? Perhaps statements that the race will *likely* be finished *very near* the 2-hour mark or *if the early pace holds* the 2-hour mark will be shattered more aptly convey some uncertainty in the prediction with the embedded assumption that the current average pace continues.

In this issue we illustrate uncertainty using Texas' recent historic cold weather and demonstrate probability through a "birthday paradox". In addition, we compare asynchronous online sections to synchronous online sections. We examine student subgroups to determine who was lost in the pandemic, and we measure movement from the STEM pathway to non-STEM pathways.

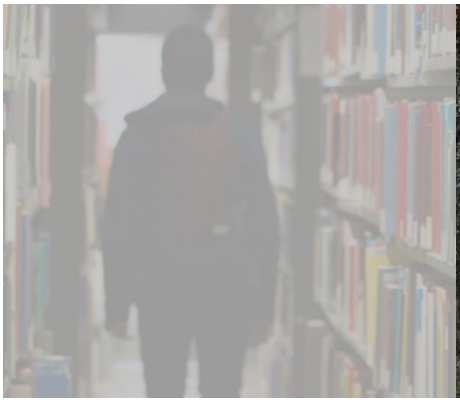
Ultimately, the value of the insights data provide should be considered in conjunction with its potential inadequacy to offer definitive answers when making decisions informed by data. Perhaps an article in this issue will guide your next decision.

inspIRe

*"Knowledge is an unending adventure at the edge of uncertainty."**

**Attributed to Jacob Bronowski*

CONTENTS



REMOTE LEARNING

Online, Choose Your Time …

Students often identify flexibility as a benefit of online courses. However, some students prefer the structure and classroom engagement of a face-to-face environment. Spring 2021 scheduling provided students a new option potentially combining benefits of both online and face-to-face learning – synchronous online.

Online, Choose Your Time

A comparison of asynchronous and synchronous online sections

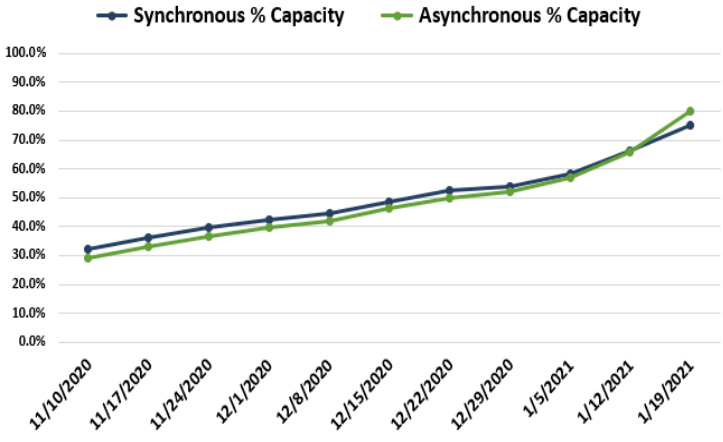
Martin Salgado-Flores & Holly Stovall

The 2020-2021 academic year at Tarrant County College was taught almost entirely online. In Spring 2021, 94.5% of enrollments were taught online, while only 5.5% of enrollments were taught face-to-face/hybrid. The unprecedented shift to online instruction required many students and faculty to adapt to an instructional method they may not have experienced before.

The traditionally face-to-face sections with regular meeting times were now built as online sections that either met online at a regular time, **synchronous**, or did not meet at a regular time, **asynchronous**.

Did Asynchronous and Synchronous sections fill faster?

Overall, asynchronous online instruction accounted for about 86% of online course enrollment in 2021SP, while synchronous instruction accounted for the remaining 14%. The percentage of filled seats early in the registration process could be an indicator of modality preference.

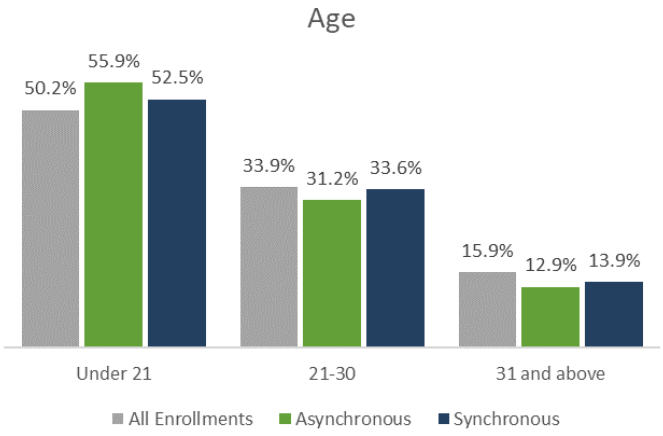


At the beginning of Spring 2021 registration, synchronous sections were outpacing asynchronous sections in filling seats. However, by the end of registration, asynchronous sections were filled at 80% section capacity and synchronous sections were filled at 75% section capacity.

Who enrolled in Asynchronous and Synchronous sections?

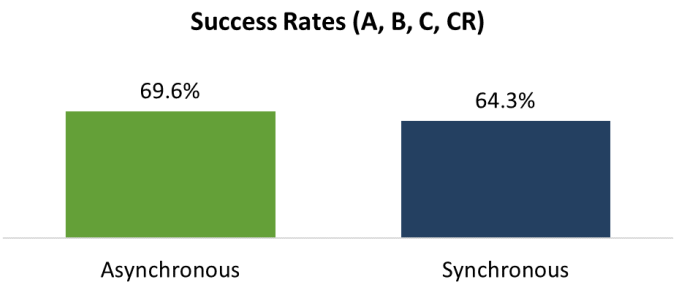
Some courses that required specialized equipment were still taught face-to-face/hybrid. In particular, courses under AERM (aviation maintenance), FIRS (firefighter certification), etc. made up the majority of on-campus sections. Among online courses, some subjects were taught either entirely synchronously (for example nursing, RNSG) or entirely asynchronously (for example philosophy, PHIL).

However, about 22% of online courses in Spring 2021 offered both asynchronous and synchronous sections which accounted for about 76% of online enrollments. Among these enrollments, the demographic distributions of gender and race/ethnicity did not differ markedly between sychronous and ayschrounous. However, the age distribution differed in that asynchronous enrollments had a higher percantage of students under 21. In addition, overall, the percentage of students under 21 was higher for online enrollments.



Comparing Success Rates of Asynchronous and Synchronous Courses

Among online courses that offered both asynchronous and synchronous sections, the total success rate of asynchronous enrollments was 69.6%, whereas the success rate of synchronous enrollments was 64.3%.



However, the difference between asynchronous and synchronous success rates varied by subject. Of the top ten subjects with the most enrollment, five of the subjects (ENGL, BIOL, ECON, and ARTS) had greater success rates with their asynchronous courses. Three subjects (HIST, SPCH, and KINE) had greater success rates with their synchronous courses, and three subjects (CHEM, MATH, and GOVT) had more similar success rates (within about a 1.5 percentage points) between their asynchronous and synchronous sections.

Success Rates by Course Type and Subject (2021SP)		
Subject	Asynchronous	Synchronous
ENGL	72.9%	70.4%
MATH	55.1%	56.3%
HIST	75.7%	84.4%
GOVT	76.9%	76.6%
BIOL	58.7%	53.3%
SPCH	65.4%	72.0%
ECON	75.0%	69.1%
KINE	70.2%	76.5%
ARTS	69.4%	63.2%
ACCT	79.6%	68.7%

Only courses that offered both asynchronous and synchronous sections were included. The highest success rate is highlighted.

There were also differences between campuses. TCC Connect had about the same success rate for asynchronous and synchronous sections. Northeast, Northwest, South, and Trinity River all had greater success rates among their asynchronous sections. However, Southeast campus had a greater success rate among their synchronous sections.

Success Rates by Course Type and Campus (2021SP)		
Campus	Asynchronous	Synchronous
CN	70.5%	70.3%
NE	70.0%	66.8%
NW	70.4%	64.5%
SE	69.5%	78.6%
SO	64.5%	59.4%
TR	70.9%	58.4%

Only courses that offered both asynchronous and synchronous sections were included. The highest success rate is highlighted.

Notably, the withdrawal rate of synchronous courses was higher than their asynchronous counterparts.

Asynchronous Withdrawal Rate: 12%

Synchronous Withdrawal Rate: 15%

Success Rates of Synchronous-Only Courses

As mentioned before, some courses were only offered as synchronous sections. The most enrolled subjects in this category include nursing (RNSG) and legal assistant (LGLA).

The success rate of synchronous-only courses was about 86.5%. The withdrawal rate was a low 5.3%.

Success Rates of Asynchronous-Only Courses

Finally, there were some online courses that were only offered as asynchronous sections. The most enrolled subjects in this category include psychology (PSYC), philosophy (PHIL) and business (BUSI).

The success rate of asynchronous-only courses was about 76%. The withdrawal rate was 9.8%.

Comparing Course Evaluations of Asynchronous and Synchronous Courses

Course evaluations were similar for courses that offered both asynchronous and synchronous. The average rating on the 1 to 4 scale ranged from 3.5 to 3.7. In the comments, students had mixed reactions to online courses. Some enjoyed the online environment with flexibility being a major theme while others are ready to return to face-to-face courses.

Student Feedback:

"I would like to see the online asynchronous option continue to be available on a permanent basis. It doesn't seem right that TCCD would make the step forward to offer such flexibility for only a few semesters, and then go back to not offering it in Fall 2021. My job requires me to spend 12 to 15 days per month out-of-state, and it is nearly impossible for me to attend a synchronous or in-person class with a M/W/F or T/Th schedule."

"Loved having the labs right here on my computer. I don't feel like any of the concepts were lost by having it online. Having the flexibility to work on Labflow assignments on my own time and schedule was truly wonderful."

"Online is not my preference but it was a well-planned out course."

"I enjoyed the way Professor 'Smith' structured her online classes. It gave me the opportunity to see my other classmates and interact with them. It helped me build up my confidence to succeed in this class."

"This course required online learning. Although I learned and doing well so far, I believe this class is definitely best suited face-to-face."

"I would have enjoyed more student engagement even in an online setting."

"The online format worked just fine for me. It was asynchronous, which gave me the flexibility to work on class material whenever I wasn't at my full-time job."

"Teach it in person and require vaccines if you're concerned about COVID. I pay the same amount for online school but retain maybe 15-20% of the knowledge because it is much harder to understand over video or ask questions and get a quick response."

"Online learning is beneficial to my schedule and study habits. Thus, this course was easy to follow through with."

"Professor 'Smith' is one of the best professors I ever had at TCC. He truly does care about his students and always has great advice to share. I absolutely did not want to take this class online but due to covid there was no choice. But I believe he did the best with teaching a science class online with a lab. I cannot wait to be back on campus to attend his class in person."

"I would definitely take this class again either in a hybrid format or in-person format or both."

"It's hard taking a course (as hard as math) online!"

"Please continue to offer online options. I cannot attend during the pre covid hours due to working full time but this is exactly what I wanted, accountability to continue to learn German. I know it would create more work to prepare an online version once Covid restrictions end but I've appreciated it so much!"

"Similar to comments related to the corresponding lecture, lab NEVER should have been moved online."

Course Evaluations by Course Type (2021SP)				
	Aysychronous		Synchronous	
	Count	Mean	Count	Mean
I have learned in this class.	10,574	3.6	1,822	3.6
The assignments add value to this course.	10,566	3.6	1,823	3.6
The course materials (textbooks, handouts, presentation slides, films, etc.) are utilized well in this course.	10,526	3.6	1,816	3.6
The feedback I received on my work improved my learning.	10,161	3.5	1,765	3.5
The feedback I received on my work was timely.	10,242	3.6	1,782	3.5
The instructor communicates at a level appropriate for me.	10,569	3.6	1,834	3.6
The instructor is available during posted office hours and appointments.	9,917	3.7	1,719	3.7
The instructor is organized, prepared and on time to class.	10,264	3.6	1,817	3.6
The instructor maintains a positive learning environment.	10,417	3.7	1,816	3.7
The instructor provides clear expectations for my learning.	10,615	3.6	1,837	3.6
The instructor uses effective teaching methods that enhance my learning.	10,508	3.5	1,823	3.5

Implications

Asynchronous and synchronous courses should be compared post pandemic to determine if differences observed in 2021SP are consistent over several semesters. Although synchronous sections filled faster initially, asynchronous sections ultimately had a higher percentage of filled seats. In terms of success, asynchronous sections had better outcomes with their success rate being 5 percentage points and their withdrawal rate being 3 percentage points lower than their comparable synchronous sections. However, this result was not consistent across all subjects with synchronous students outperforming asynchronous students in subjects such as history, speech, and kinesiology. Lastly, evaluations did not differ markedly between the two online modalities, but students articulated a strong desire for options when choosing the learning environment with some needing the flexibility of online course while others prefer the face-to-face engagement.

Preparing Students for Their Future Work Environment

In a recent post on the JobsEQ (Chmura) website, data comparing online jobs posted in 2021Q1 to 2020Q1 and results from a recent survey suggested expectations for remote work could remain well after the pandemic. Thus, providing students with online, hybrid, face-to-face options to teach skills to navigate any environment may best prepare them for jobs that expect workers to seamlessly transition from in person to online routinely.

87%

of workers who have been working remotely during the pandemic **want to continue working remotely** at least one day per week one the pandemic subsides.

34%

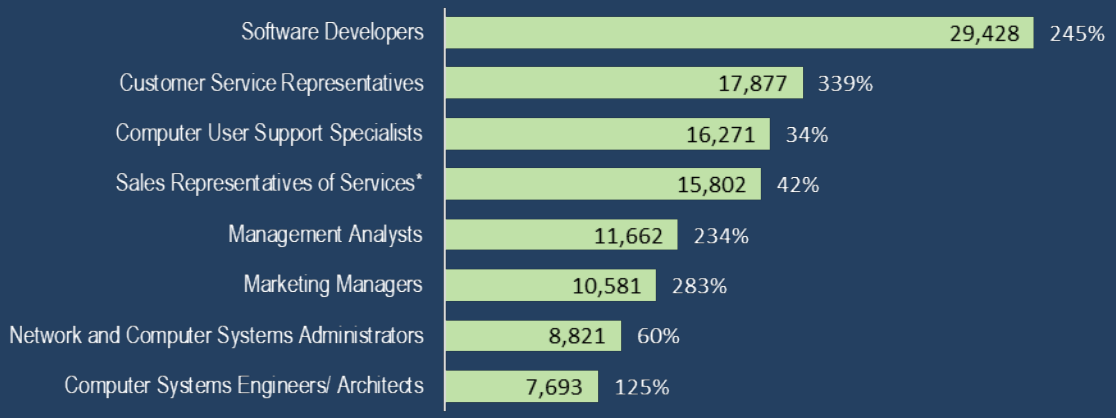
of workers planning on looking for work want to find a job where they can work remotely

42%

of current remote workers stated if their current company doesn't continue to offer remote-work option long-term, they will look for a job at a company that does

Top Occupations with Remote Work Jobs Ads

Number of Remote Work Jobs Ads Jan/Feb 2021 and Growth Rate in Remote



Source: JobsEQ

* Except Advertising, Insurance, Financial Services, and Travel

Sources:

[1] Orbit Student Enrollment Section Details (not including credit type N)

[2] DRS 414740: Synchronous vs. Asynchronous Fill Rates

[3] Orbit Course Evaluations

Changing Course: Academic Support after Early Intervention

Early Intervention

A new semester starts, and the few first weeks quickly pass. Missing class or not completing an assignment are early indicators that a student may not successfully complete the course without changing their current trajectory. Faculty can intervene by sending an *early alert* directing students to additional support. Students who utilize TCC's academic support resources after this early invention may re-direct themselves onto a more successful path.

Number of Alerts

Faculty can send either assignment or attendance early alerts. Each fall from 2017 to 2019, roughly 20,000 alerts, on average, were sent with about one-third being assignment alerts. The top courses for assignment alerts sent, ENGL-1301, STSC-0111, and ENGL-1302, accounted for about one in five of all assignment alerts. Similarly, these courses in addition to MATH-0361 had the highest number of attendance alerts accounting for almost one in four of all attendance alerts. For students receiving an alert, the first alert occurred around the beginning of the sixth week of that course, on average, and almost one-third of first alerts happened in the first three weeks.

Likelihood of Receiving an Alert by 3rd Week

There was about a 2.5% chance that a student received their first alert in the first three weeks of a course. Students who were sent this first alert received at least one more alert for that course about 60% of the time.

A multitude of factors contribute to students missing class or assignments causing them to get an alert. Some students may enter a class less academically prepared than others. TSI status, a metric for preparedness, was associated with a higher likelihood of receiving a first alert by the end of the third week.

Compared to TSI met students, students liable in one area (reading, writing, or math) were about 1.2 times more likely to receive an alert for a course in the first three weeks, and students liable in all three areas were almost 3 times more likely to receive an alert for a course in the first three weeks.

Course load could be an indicator of commitments outside of being a student such as work or caring for children since a student might go part-time due to these obligations. The likelihood of getting a first alert by the end of the third week decreased slightly as course load increased. Students taking five or fewer hours were about 1.3 times more likely to get an alert by the end of the third week than students enrolled in 15 or more hours.

Being newer to college could mean that an early set back like missing classes or assignments feels more overwhelming because the student may not have as much experience overcoming the "bumps" along the college journey. First time in college (FTIC) students

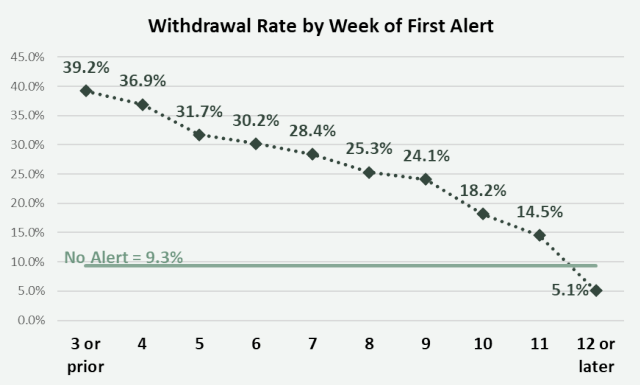
were about 1.5 times more likely to get an alert by the end of the third week than students who were not FTIC.

Implications of an Alert

First alerts occurring in the first three weeks were strong indicators for withdrawal.

Students who received an alert in the first three weeks were about 4 times more likely to withdraw from the course than students who did not receive an alert.

The average time between first alert and withdrawal was about three weeks.

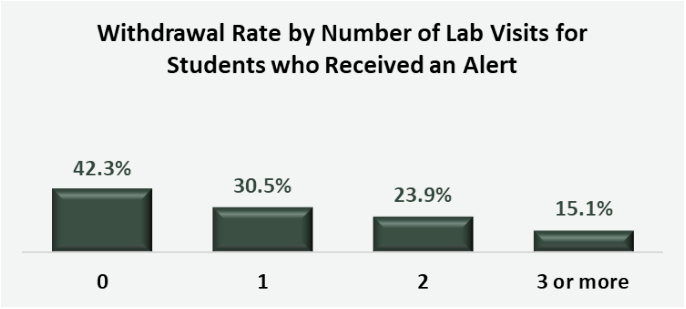


Academic Support after an Alert

About 10% of students who received an alert in the first three weeks visited an academic lab for the course after receiving the alert, while about 82% did not visit a lab. (About 7.5% had visited a lab prior to their first alert.)

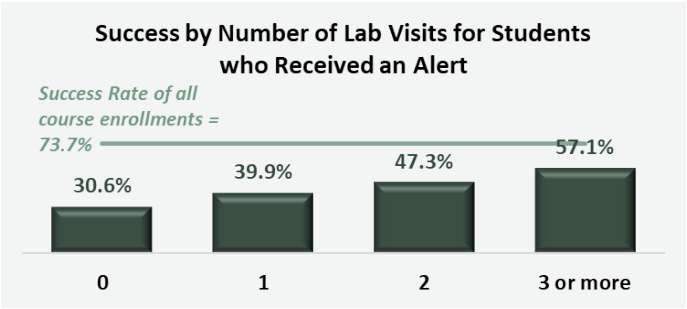
Students who received an alert in the first three weeks and then visited a lab three or more times after that alert were almost 3 times less likely to withdraw from the course than students who received an alert in the first three weeks and did not visit a lab.

Overall, the withdrawal rate for students who received an alert in the first three weeks and then visited a lab for the first time (~24%) was almost 20 percentage points lower than the withdrawal rate for students who received an alert in the first three weeks and did not visit a lab (~42%).



Includes students who did not visit a lab and students whose first visit to a lab was after the first alert which occurred in the first three weeks.

In addition, the success rate (A, B, C, CR) for students who received an alert in the first three weeks increased as the number of lab visits after the alert increased.



The success rate of 73.7% includes all course enrollments regardless of whether the student received an alert or visited a lab.

Conclusion

Visiting a lab after receiving an alert may have contributed to improved outcomes or "altered the student's path". Students who visited a lab after receiving their first alert by the end of the third week were much less likely to withdraw and had a substantially higher success rate with outcomes continuing to improve as the number of lab visits increased. However, the success rate of those receiving an alert and then visiting a lab did not reach the success rate for all students (~74%). Thus, students receiving an alert may benefit from additional support meaning other assistance opportunities should be investigated, developed, and/or marketed.

Source: ST Student Enrollment Data (credit type N removed), ST Alerts, TutorTrac and ODR

All lab and supplemental instruction visits attached to a specific course in which the student was enrolled were included.

LOST

IN THE PANDEMIC

By: Elizabeth Northern

LOST in the Pandemic

COVID-19 has altered our lives in ways we could have never imagined. For some of the students at TCC, the strain from the pandemic prohibited them from returning to normal coursework due to illness, job and family commitments, and financial hardship. This article sheds light on the group of students TCC lost in the wake of the pandemic.

DECLINES ACROSS THE BOARD

The 6.9% drop in headcount at TCC during the Fall of 2020 is the largest drop since the Fall of 1985, when TCC experienced an 8.5% drop in headcount from the Fall of 1984.[1] Across the United States, community colleges experienced 9.5% decline in headcount in 2020FL.[2] And in Texas, public two-year colleges experienced an overall 7.8% decline in headcount in 2020FL.[3]

US Community Colleges	*TX Community Colleges*	*TCC*
-9.5%	-7.8%	-6.9%
DECLINE IN HEADCOUNT		

DEFINTIONS

For this analysis, a few definitions will be used to explore and identify the group of students who did not return to TCC in 2020FL.

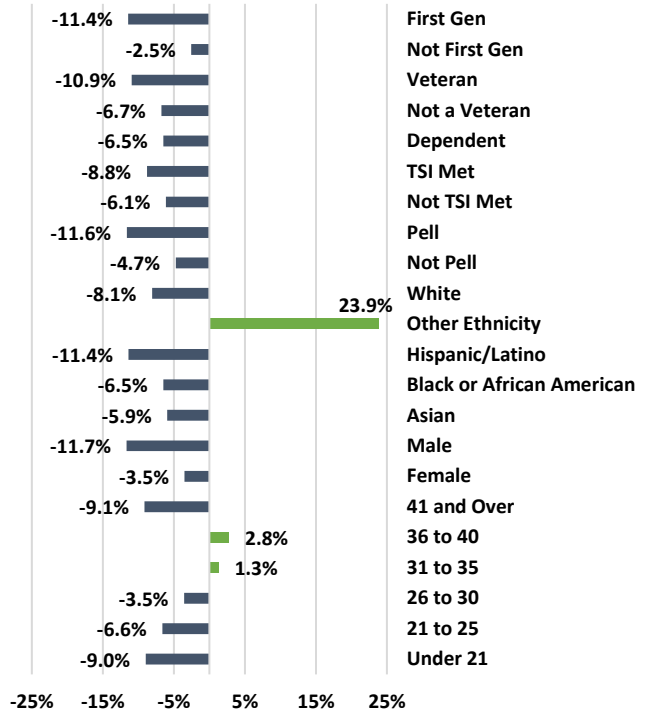
- ***Percent Change***: the change in enrollment from one time-period to the next. It represents the relative change between 2019FL and 2020FL.
- ***Percentage Point Difference***: the changes in percentages from one time-period to the next. It represents the numerical difference between percentages in 2019FL and 2020FL.
- ***Attrition***: the rate of dropout of students from 2019FL who did not return in 2020FL. The percentage point difference for attrition rates is used in this report.

BY PERCENT CHANGE

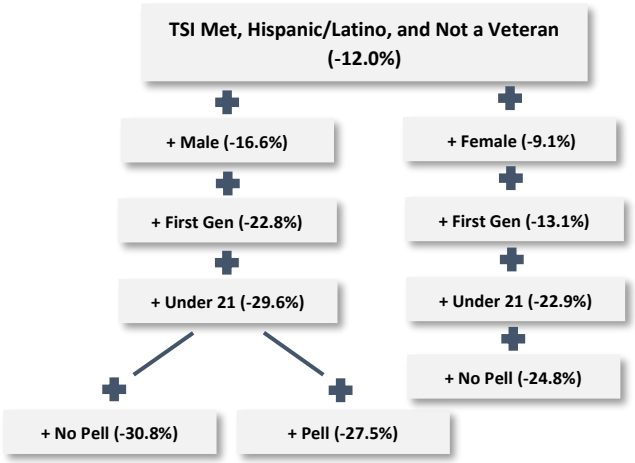
When disaggregating the students by a number of demographic variables, a few groups have dropped at higher rates than others. The values below compare 2019FL headcounts to 2020FL headcounts:

- **Gender**: Compared to females (about 3.5% drop), males experienced about 11.7% drop in headcount.
- **Ethnicity**: Hispanic/Latino students witnessed about 11.4% drop in headcount.
- **Age Range**: Student groups aged "41 and Over" as well as "Under 21" both dropped about 9.0%.
- **Veteran Status**: The veteran population experienced about 10.9% decline in headcount.
- **First Generation**: Students who identified as first generation witnessed about 11.4% drop in headcount.
- **Pell Eligibility**: There was about 11.6% drop in headcount for students who were Pell eligible.
- **TSI Readiness**: Students who were TSI met at the start of the respective semesters experienced about 8.8% drop in headcount.

Percent Change



When combining variables, some grouping had a greater than 20% decline. The groupings with the highest drops often had three common variables: TSI Met, Hispanic/Latino, and net being a veteran. Example: Combining some additional factors with these three common variables.

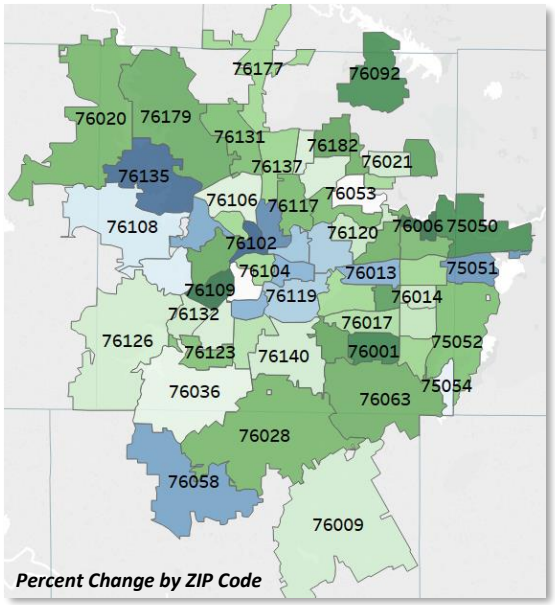


Male students who were first generation, under the age of 21, TSI met, not a veteran, Hispanic/Latino, and not Pell eligible (-30.8%) or Pell eligible (-27.5%) experienced the highest decline in headcount, for males.

Female students who were first generation, under the age of 21, TSI met, not a veteran, Hispanic/Latino, and not Pell eligible (-24.8%) also experienced the highest decline in headcount, for females.

ZIP CODE

By ZIP Code, 76102 and 76135 both experienced about 21% decline. In the visual, darker green indicates lower drop while darker blue indicates higher drop.



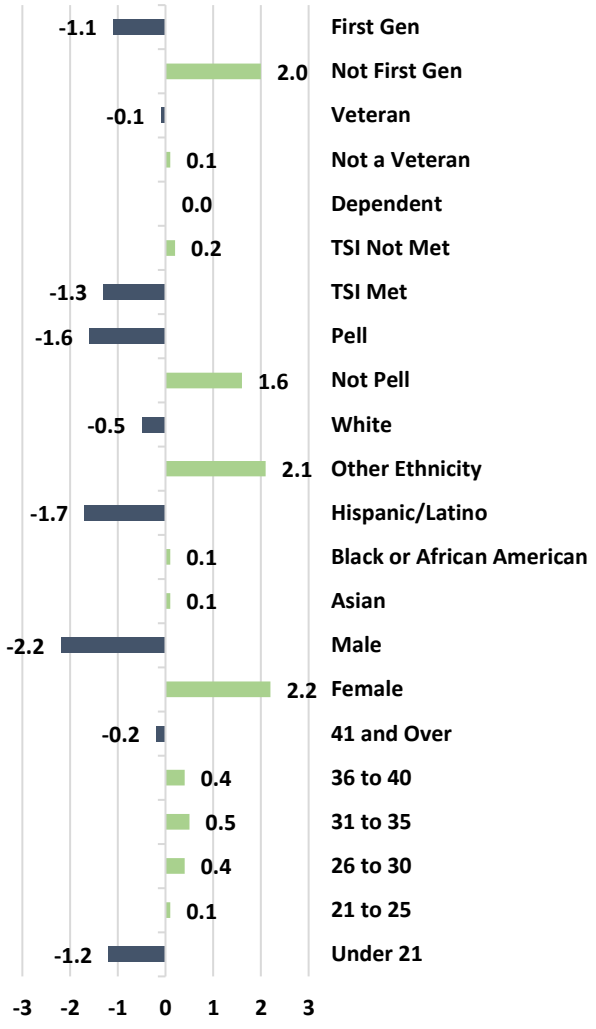
Percent Change by ZIP Code

BY PERCENTAGE POINT DIFFERENCE

When comparing the percentage point differences amongst various demographic variables, groups experiencing high percentage point drops were similar to those groups experiencing high percent change drops:

- **Gender**: Males experienced about 2.2 percentage point decrease in headcount.
- **Ethnicity**: Hispanic/Latino students witnessed about 1.7 percentage point drop in headcount.
- **Age Range**: The "Under 21" student group dropped about 1.2 percentage point drop in headcount.
- **First Generation**: Students who identified as first generation witnessed about 1.1 percentage point drop in headcount.
- **Pell Eligibility**: There was about 1.6 percentage point drop in headcount for students who were Pell eligible.
- **TSI Readiness**: Students who were TSI met at the start of the respective semesters experienced about 1.3 percentage point drop in headcount.

Percent Point Difference

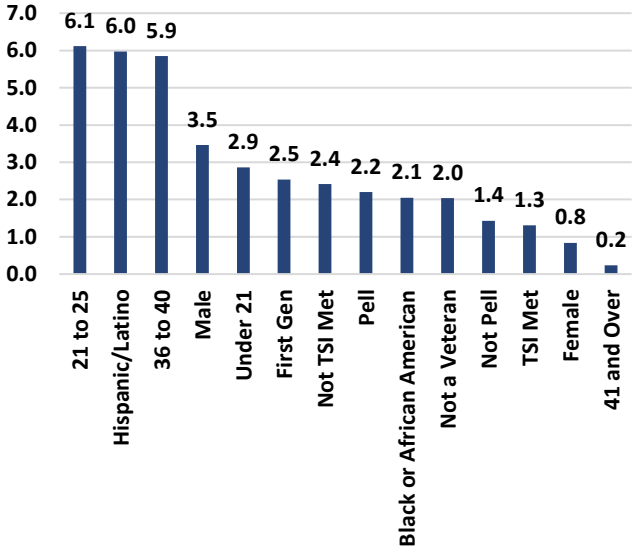


BY ATTRITION

To examine any changes in attrition, only degree-seeking first time in college students (DS FTIC) were analyzed from the 2018FL and 2019FL cohorts.

- From the 2018FL DS FTIC cohort, about 45% of students did not return in 2019FL.
- From the 2019FL DS FTIC cohort, about 47% of students did not return in 2020FL.
    - The percentage point change in attrition between the two cohorts was about 2 points.

Percent Point Increase in Attrition



When disaggregating the DS FTIC students by a number of demographic variables, the students with the largest increases in attrition were:

- **Students ages 21-25**: 6.1 percent point difference
- **Hispanic/Latino students**: 6.0 percent point difference
- **Students ages 36-40**: 5.9 percent point difference
- **Male students**: 3.5 percent point difference
- **Students Under 21**: 2.9 percent point difference

CONCLUSION

Across the various demographics and measures, a few groups of students did not return in 2020FL more than other groups – specifically male and Hispanic/Latino students.

	All Community Colleges in US	*TCC*
Male Students	-14.4%	-11.7%
Hispanic/Latino Students	-10.6%	-11.4%
Male Hispanic/Latino Students	**-16.6%**	**-16.6%**

Different studies have interviewed students about their shift away from higher education with many students attributing a lack of financial resources while struggling through the pandemic. Others have voiced immediate, flexible job opportunities due to the rise in delivery service opportunities.[5]

Suggestions for engaging the students who left higher education during the pandemic:

- Highlighting the value of a certificate or associates degree towards earning higher paying salaries often attainable while working.
- Connecting students to a variety of financial resources, especially during the college application process while in high school.
- Assisting dual credit students with their bridge to two-year or four-year schools to efficiently connect their coursework towards a degree.
- Emphasizing the short-term gains from immediately entering the workforce versus the long-term rewards from earning a credential.

[1] https://www.tccd.edu/documents/about/research/institutional-intelligence-and-research/statistical-handbook/2020FL-statistical-handbook.pdf (credit type N, audits, and missing grades removed)
[2] https://public.tableau.com/app/profile/researchcenter/viz/Fall20203asofOct_22/Fall2020EnrollmentNo_3
[3] https://reportcenter.highered.texas.gov/meeting/committee-supporting-documents/10-20-idea-v-b-ppt/
[4] Only groups over 100 students included in this percent change analysis.
[5] https://hechingerreport.org/the-pandemic-is-speeding-up-the-mass-disappearance-of-men-from-college/

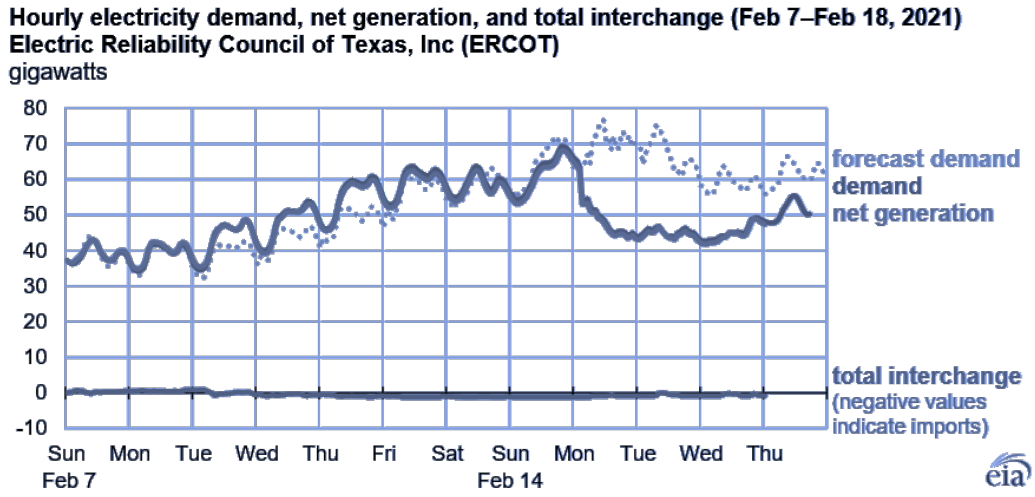
Whether you call it “Snowmageddon”, “the free Alaska vacation”, or some other colloquialism, Texans will likely not soon forget the weather event of February 2021. Local WFAA meteorologist Kyle Roberts stated that “this cold air outbreak that we just experienced could end up being once in a generation or even once in a lifetime cold” and presented some staggering statistics.

Record Shattering for Dallas-Fort Worth:

Coldest 3-day Span	Second Coldest Day Ever	Valentine’s Day Snow
10.8°	-2°	4”
The average temperature from Feb. 14-16, 2021 beat the old record of 11.7° (Dec. 22-24,1983). Prior to 1983, the record was 12.3° set in 1899.	The Feb. 16, 2021, below 0 temperature tied the second coldest day on record (Jan. 31, 1949). The coldest day, -8°, occurred way back on Feb. 12, 1899.	The snowfall beat the prior Valentine’s Day record of three inches in 1951 and broke the snow drought having not seen 1 inch of snow since Mar. 5, 2015.

https://www.wfaa.com/article/weather/historic-cold-a-look-at-the-record-breaking-past-few-days/287-529958c6-0216-4c7c-b67c-8141907b6cb8

Weather: https://w2.weather.gov/climate/xmacis.php?wfo=fwd Energy: https://www.eia.gov/todayinenergy/detail.php?id=46836



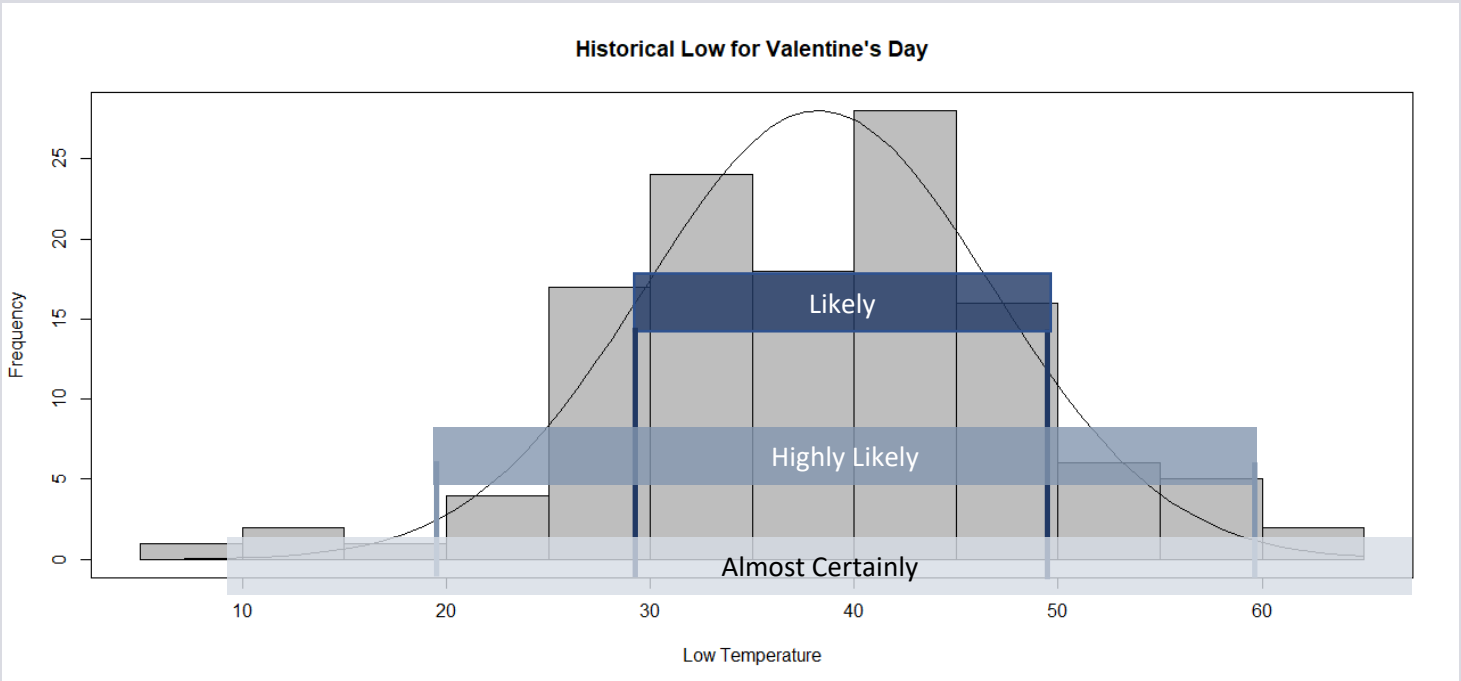
Source: U.S. Energy Information Administration, *Hourly Electric Grid Monitor* (ERCOT demand, net generation, and interchange)

Representing Uncertainty

Weather data provide a nice segue into forecasting and representing uncertainty. Historical records for DFW weather start on September 1, 1898. Let's say we want to use the past 124 years of temperature readings on February 14th to predict the low temperature on Valentine's Day 2022*. On average, the low is 39°, so if we had to make our "best guess", then predicting 39° seems reasonable. However, we know there is a wide range of lows that have occurred historically. Thus, this variation creates uncertainty about our prediction that we may want to represent by also attaching our confidence or a range of plausible values to our single guess.

For simplicity, we'll use the standard deviation of about 10° to help create these ranges. Note that the well-known "bell-curve" (i.e. a normal distribution) fits the data decently. Historically, almost 70% of the time the low was between 29° and 49°. About 95% of the time the low was between 19° and 59°, and about 99% of the time the low was between 9° and 69°. Thus, although we are predicting a low of 39°, we might also say the low is:

- likely between 29° and 49°
- highly likely between 19° and 59°
- almost certainly not more extreme than 9° or 69°



** By using all historical date records, an assumption is being made that ecological factors influencing historical weather patterns will remain consistent in the future. More sophisticated approaches might incorporate global climate changes or weight more recent data more heavily.*

From Developmental to College-level English

A look at the new co-requisite model

Over the last decade, several major changes have altered the pathway from developmental English to college-level English. Developmental reading and writing were integrated through developmental courses called INRW. The TSI assessment (Texas Success Initiative) was introduced in 2013. In 2017, the college-ready cut score for English on the TSI test was lowered based on the essay score, and in 2021 a new TSI test was adopted. Lastly, House Bill 2223 introduced the co-requisite model in Fall 2018. The co-req model allows students to take a developmental or non-course based option (NCBO) alongside college-level English; whereas the prior sequential model required completion of a developmental course before enrolling in college-level English. In this article, the outcomes from the co-req model are compared to the sequential model for English 1301.

ENGLISH 1301

From Fall 2016 to Spring 2018, the success rate for students who took ENGL-1301 for the first time without prior developmental/NCBO courses was about 77%. However, the success rate for students who took ENGL-1301 for the first time after taking developmental/NCBO (the sequential model) was about 10 percentage points lower (66%).

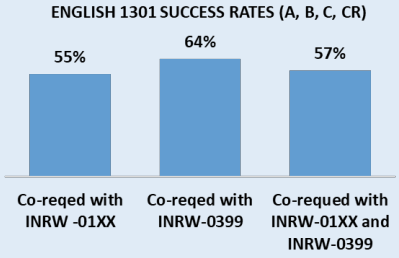
The gap in success rates between those who took ENGL-1301 for the first time without dev ed and those who took ENGL-1301 after dev ed increased about 15 percentage points from Fall 2018 to Spring 2021. Overall, students in the sequential model (64% success rate) outperformed students in the co-req mode (62% success rate), but in Spring 2019, Fall 2019, and Fall 2020, students in the co-req model had higher success than students in the sequential model.

Fall 2018, Spring 2019, Fall 2019, Spring 2020, Fall 2020, Spring 2021 Co-Req Model Design

Three co-req models for ENGL-1301:

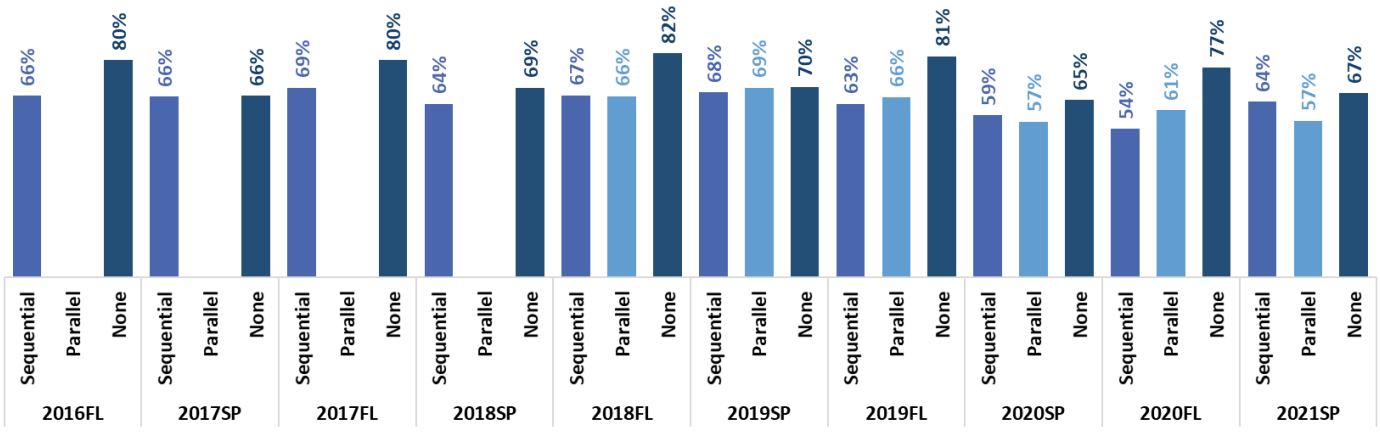
1. Co-reqed with INRW -01XX
2. Co-reqed with INRW-0399
3. Co-reqed with INRW-01XX and INRW-0399

Success rates were highest when ENGL-1301 was co-reqed with INRW-0399. They were about 6 to 8 percentage points higher than the success rates in other co-req models.



Source: Orbit Student Enrollment Data - Note: Summer terms were excluded.

ENGLISH 1301 SUCCESS RATES (A, B, C, CR)



THE DAILY STAT

SUMMER 2021 | INSTITUTIONAL RESEARCH | DATA'S ANATOMY | TARRANT COUNTY, TX

STUDENT STUMBLES UPON DATA SET

Reporter: Dan Dumas

It's not every day that someone stumbles upon a data set. But, in this case, it really happened.

While working on an analysis, said student did indeed fall head over feet across some plots and charts. Officials report no injuries.

For more information, view Institutional Research's Dataline "Plots and Charts."

DEAR DABBY,

I've been having a hard time sleeping, due to a recent traumatic experience at the zoo. I was attacked by a monkey who hurled his bananas at me. My ego has been permanently bruised. How can I improve my self-esteem?
- MONKEY BUSINESS

DEAR MONKEY BUSINESS,

Try an ice pack. And, it sounds like you need to learn more about the pathways at the zoo. Tune into Institutional Research's Data's Anatomy, Season 6, Episode 2: "Galloping Through Guided Pathways."

HELP WANTED:

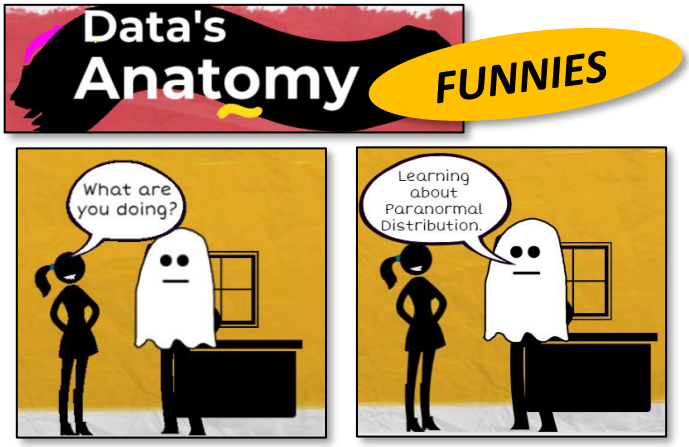
DATA ANALYST

Due to an unforeseen series of events involving intergalactic forces and uncommon holiday office parties, Data's Anatomy needs an additional data analyst.

Qualifications include a good sense of humor, a respectable singing voice, and the ability to explore the confusing, numerous, often conflicting data sources and definitions used at TCC.

If no applications meet required credentials, then current analysts will suffice.

For more information, check out Season 6 of Data's Anatomy.



SEASON 6 EPISODES

NOW SHOWING

Episode 1: Talking About TSI Testing
Episode 2: Galloping Through Guided Pathways
Episode 3: Valuing Veterans
Episode 4: Expanding Upon External Data Sources
Episode 5: Investigating Inconsistent Definitions
Dataline: Small Sample Stumbles
Dataline: Plots and Charts

Data's Anatomy is IR's in-house video series, made to clarify important data terminology, calculations, and refresher tips on easily confused data concepts. Find them on our website!!

CONTINUING THE PATH:

Certificate to Associate Degree

TCC → CERTIFICATE → ASSOCIATE DEGREE

Starting the Path

Credentials are called "stackable" when a sequence of awards is created to allow students to progress along a career pathway through upskilling. TCC offers certificates that could serve as a first step towards an associate degree and may allow students to become employable and gain industry experience as they continue their education.

Earning an Associate after Certificate

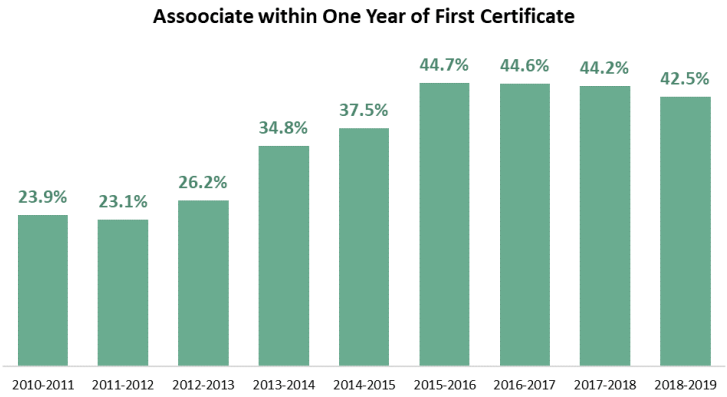
Students whose first award was a certificate conferred between 2010FL and 2019SU were tracked to determine the number who also earned an associate degree.

Overall, almost 40% earned an associate within one year of their first certificate with almost 20% graduating with an associate simultaneously with their first certificate.

The percentage of students who earned an associate within two years of their first certificate increased about four percentage points, but the percentages who earned an associate within 3 years and 4 years did not increase markedly. So, the likelihood of earning an associate after a certificate begins to level off after year 2 or year 3.

Trends – Earning an Associate within One Year

The percentage of students earning an associate degree within one year of their first certificate increased from about 24% in 2010-2011 to about 43% in 2018-2019. This increase may be related to increased program options as TCC evaluates both what programs should be offered and what level of credential is needed based on environmental scans and advice from industry partners.

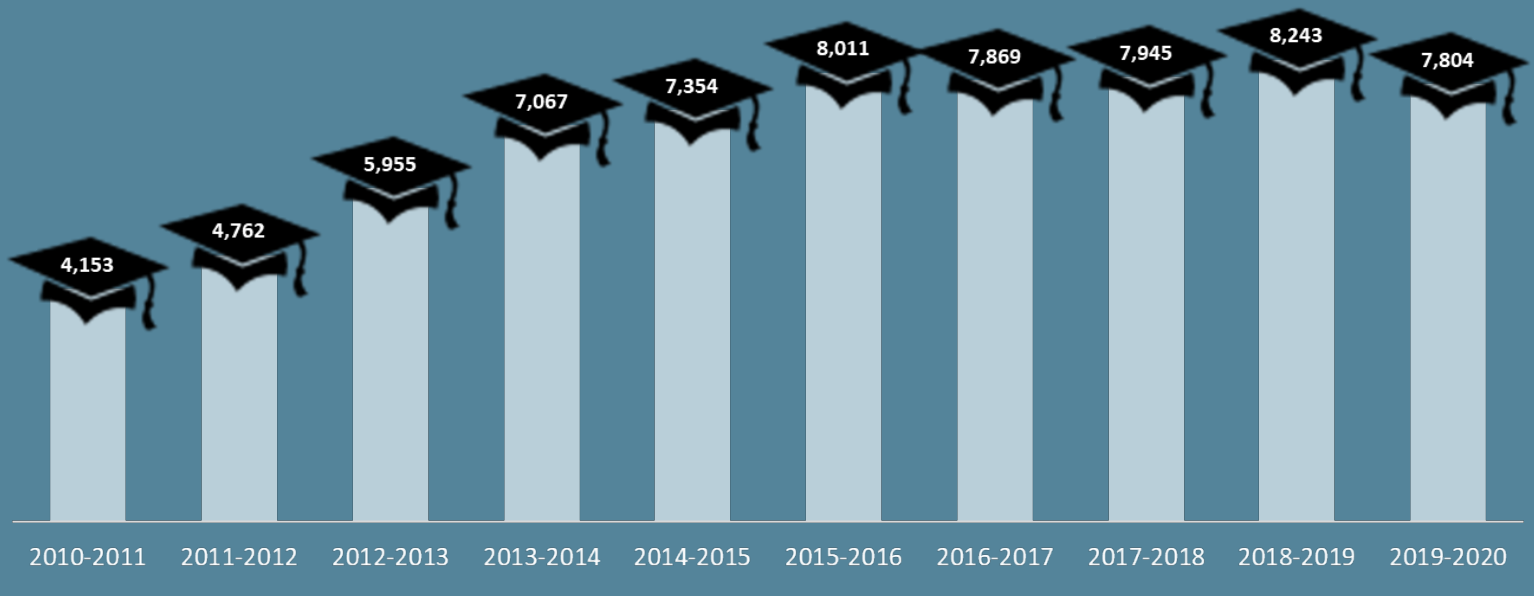


Almost 90% of the associate degrees awarded within a year of the student's first certificate were Associates of Applied Science while about 10% were Associates of Arts.

Associate After First Certificate:

		Within 0 Years*		Within 1 Year		Within 2 Years		Within 3 Years		Within 4 Years		Within 5 Years		Within 6 Years	
	Cohort	N	%	N	%	N	%	N	%	N	%	N	%	N	%
2010-2011	700	94	13.4%	167	23.9%	193	27.6%	218	31.1%	230	32.9%	235	33.6%	244	34.9%
2011-2012	912	89	9.8%	211	23.1%	251	27.5%	272	29.8%	284	31.1%	296	32.5%	300	32.9%
2012-2013	1,294	179	13.8%	339	26.2%	406	31.4%	429	33.2%	443	34.2%	453	35.0%	463	35.8%
2013-2014	1,309	233	17.8%	455	34.8%	520	39.7%	553	42.2%	563	43.0%	576	44.0%	585	44.7%
2014-2015	1,209	259	21.4%	453	37.5%	523	43.3%	550	45.5%	557	46.1%	566	46.8%		
2015-2016	1,153	285	24.7%	515	44.7%	579	50.2%	604	52.4%	615	53.3%				
2016-2017	1,295	322	24.9%	578	44.6%	651	50.3%	673	52.0%						
2017-2018	1,180	230	19.5%	521	44.2%	592	50.2%								
2018-2019	1,208	213	17.6%	514	42.5%										

Historical Data: Number of Degrees/Certificates Conferred By Academic Year



Common Pathways – Earning an Associate within One Year

The most common program groups (2-digit CIP series) for students earning an associate within one year of their first certificate were business and computer information sciences, which accounted for about half of the certificates to associates within a year. Mechanic & repair technologies, engineering technologies, and health professions were also in the top-five.

- 52) BUSINESS, MANAGEMENT, MARKETING, AND RELATED SUPPORT SERVICES (37.1%)
- 11) COMPUTER AND INFORMATION SCIENCES AND SUPPORT SERVICES (13.1%)
- 47) MECHANIC AND REPAIR TECHNOLOGIES/TECHNICIANS (9.6%)
- 15) ENGINEERING TECHNOLOGIES/TECHNICIANS (7.1%)
- 51) HEALTH PROFESSIONS AND RELATED CLINICAL SCIENCES (6.5%)

Top 20 Certificate to Associate Programs for Students Earning Associate within One Year of First Certificate

Certificate	Associate within One Year	Count	%
CRT.Business I	AAS.Business Administration - Business	299	4.9%
CRT.Management I	AAS.Business Administration - Management	200	3.3%
CRT.Business II	AAS.Business Administration - Business	199	3.3%
CRT.Cisco Support	AAS.Information Technology-Network Support	114	1.9%
CRT.Accounting Assistant I	AAS.Business Administration - Accounting Assistant	104	1.7%
CRT.Information Technology Support	AAS.Information Technology-Network Support	100	1.7%
CRT.Sign Language Communicator	AAS.Sign Language Interpreting	95	1.6%
CRT.Aviation Maintenance Technology Airframe	AAS.Aviation Maintenance Technology	89	1.5%
CRT.Accounting Assistant II	AAS.Business Administration - Accounting Assistant	87	1.4%
CRT.Preschool Child Care Provider	AAS.Child Development	86	1.4%
CRT.Substance Abuse Counseling	AAS.Mental Health Substance Abuse Counseling	83	1.4%
CRT.Accounting Assistant II	AAS.Accounting Information Management	80	1.3%
CRT.Social Work	AAS.Mental Health Substance Abuse Counseling	80	1.3%
CRT.Culinary Arts I	AAS.Culinary Arts	79	1.3%
CRT.Computer Graphics	AAS.Graphic Communication	79	1.3%
CRT.Management II	AAS.Business Administration - Management	77	1.3%
CRT.Aviation Maintenance Technology Airframe	AAS.Aviation Maintenance Technology Airframe	75	1.2%
CRT.Management	AAS.Business Administration - Management	74	1.2%
CRT.Accounting Assistant I	AAS.Accounting Information Management	74	1.2%
CRT.Accounting Assistant I	AA.Associate of Arts	73	1.2%

Source: DA Degrees (excludes MSA, OSA, FOS)

Note: Within year was defined as within three terms. For example, a student earning a certificate in 2010FL must have earned an associate by the end of 2011FL.

STEM

The Leaky Pipeline

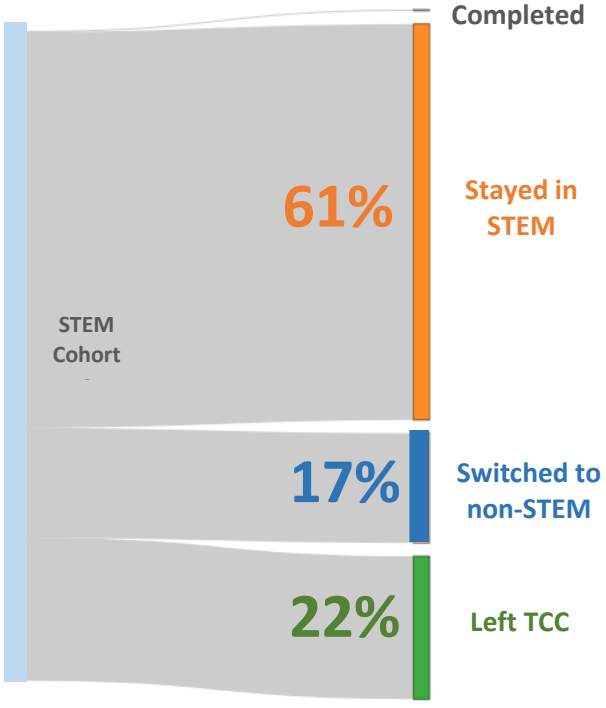
A Closer Look at Students who Switch from the STEM Pathway

"The Leaky Pipeline" is a phrase used to describe the group of students who declared a program but do not ultimately complete it. While some students may switch from their initial program to a related program in the same pathway (meta-major), others make a more substantial change and move to an alternative pathway. Measuring the "leak" from a pathway or program and investigating potential contributing factors may help determine how to help students complete their college journeys.

At TCC, students choose a program that fits within one of five pathways – *STEM, Business & Industry, Arts & Humanities, Human & Public Service, and Health Science.*

Switching from STEM to non-STEM Pathway

Fall 2017, 2018, and 2019 degree-seeking first time in college (DS FTIC) students who started their first fall term on a STEM pathway were tracked for their first academic year to gauge movement out of the STEM pathway. The combined cohort consisted of almost 2,000 students. Of these students, **about 17% switched from STEM to a non-STEM pathway in their first year.**



Outcomes of Declared Programs

2017FL, 2018FL, 2019FL DS FTIC

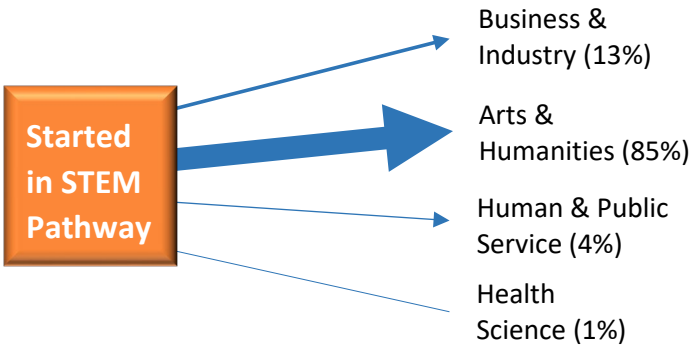
Stayed in STEM: Started Fall in a STEM pathway, enrolled in a STEM pathway in the last enrolled term (Spring or Summer) of their first year, and did not earn a degree or certificate from a program within STEM in their first year.

Switched to non-STEM: Started Fall in a STEM pathway, enrolled in only non-STEM pathway(s) in the last enrolled term (Spring or Summer) of their first year, and did not earn a degree or certificate from a program within STEM in their first year.

Left TCC: Started Fall in a STEM pathway, were not enrolled in the following Spring or Summer, and did not earn a degree or certificate from a program within STEM in their first year.

Completed: Started Fall in a STEM pathway and earned a degree or certificate from a program within STEM in their first year.

Most STEM students who switched moved to an Arts & Humanities pathway. Few students moved from STEM to a Health Science pathway.



Potential Factors for Choosing to Switch

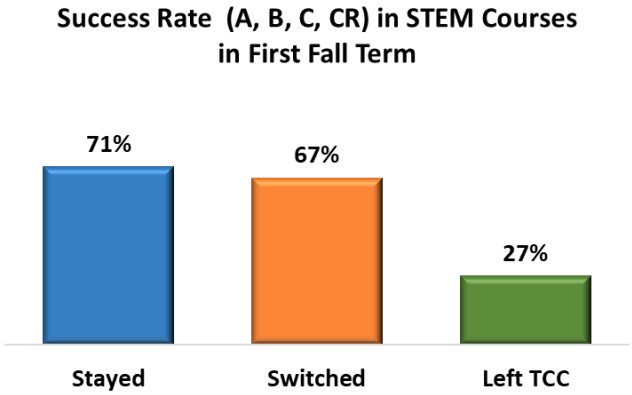
Academic preparedness may be one factor contributing to students who leave the STEM Pathway.

- **DS FTIC STEM students who stayed on the STEM pathway were about 1.5 times more likely to have entered college as TSI met in math than students who switched to a non-STEM pathway**. (The percentage of TSI met in reading and writing did not differ markedly between STEM students who stayed and those who switched.)
- About 5% of DS FTIC STEM students had prior dual credit/early college high school experience. **DS FTIC STEM students who stayed on the STEM pathway were about 2 times more likely to have had prior DC/ECHS experience than students who switched to a non-STEM pathway.**

Association between Early Success in STEM Courses & Switching to non-STEM Pathway

Another potential factor that may influence whether a STEM student chooses to stay on the pathway is early success in STEM courses. When combined, the Fall 2017, 2018, and 2019 DS FTIC STEM cohorts enrolled in about 1,600 STEM courses (BIOL, CHEM, COSC, MATH, and PHYS) in their first term. MATH courses accounted for about 80% of the STEM course enrollment, and COSC courses accounted for roughly an additional 10%.

Students who stayed in STEM had a success rate that was about 4 percentage points higher than students who switched to non-STEM and about 44 percentage points higher than students who left TCC.



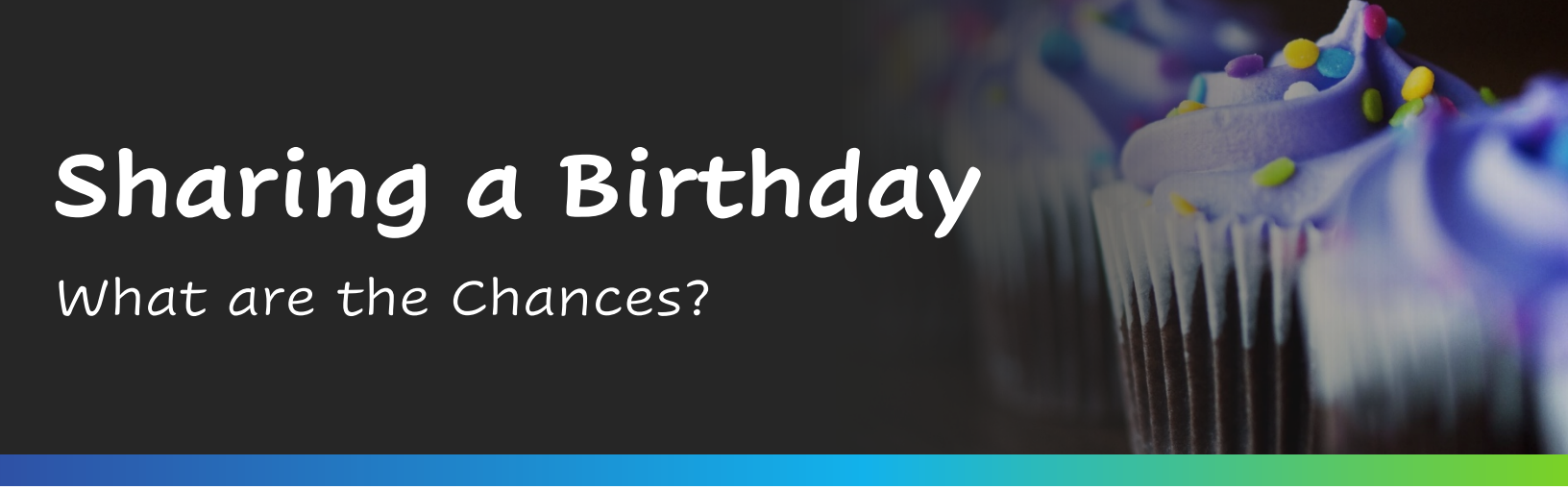
- For MATH courses, the students who stayed in STEM had a success rate of 71%. Students who switched had a MATH success rate of 67%, and students who left had a MATH success rate of 29%.

Conclusion

In summary, about one in five students switched from a STEM pathway to a non-STEM pathway with the majority switching to Arts & Humanities. This group and the one in five students who left TCC present an opportunity to increase the number of STEM completers through efforts designed to seal the pipeline. Work could potentially include increasing awareness and expansion of academic support targeted towards FTIC STEM students enrolled in STEM courses during their first fall term.

Future research should include an in-depth analysis to determine the STEM programs with the highest attrition and the top non-STEM programs for students who moved from a STEM pathway. In addition, gaining a deeper understanding of why students switched to a non-STEM pathway or left TCC could allow tailored support systems.

Source: ST Student Enrollment & Demographics WHDB



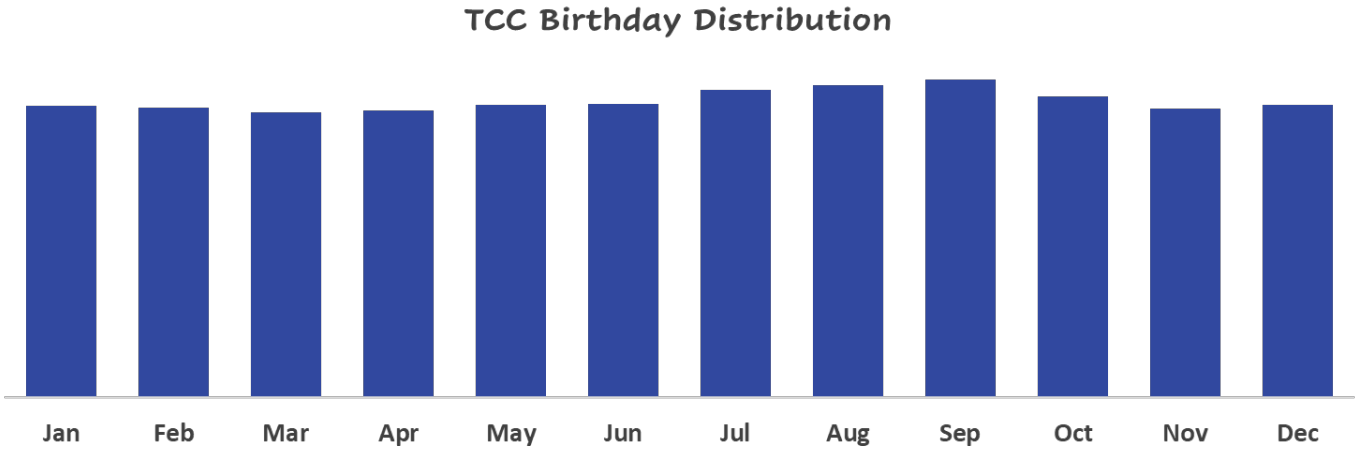
Sharing a Birthday

What are the Chances?

If you think a discussion about birthdays will be dry and boring, consider potential implications of when a birthday falls in the calendar year. A kids' sports league like hockey might use January 1st as the birthday cut-off meaning players born between January 1st to December 31st of the same year play together. Then those born in the earlier months of the year will always be the oldest players in their age level. In the academic setting, September 1st may be used as the cut-off since a new school year starts in the fall. As such, children born in September and October are often the oldest in their class from primary through secondary education. Though a year may seem insignificant, a kindergartener born September 1st has about 20% more life experience than a kindergartener born in August of the following year. Researchers study the potential ramifications of the creation of age-based cohorts due to an arbitrary birth-date deadline – *the birthday effect.*

In this article, we focus on something simpler, but perhaps just as compelling – the distribution of birthdays. In the US, mid-September is the most popular time for birthdays. The top-five birthdays fall within a span of about a week in September with the 9th being the most common birthday. Holidays like Thanksgiving, Christmas, New Years, and July 4th are among the least common birthdays. However, Valentine's Day ranks high as well as days some might associate with luck (7/7 & 8/8). In addition, fewer births were on the weekends. Saturday and Sunday accounted for about 20% instead of the approximately 28% expected if births by day of week were uniform.

Birthdays of TCC students followed a similar pattern with September being popular. In addition, except for Valentine's Day, which ranked in the top 15, major holidays were unpopular.



TCC birthday distribution included all UG students from 15-16 AY to 19-20 AY

US birthday distribution included data from Centers for Disease Control and Prevention's National Center for Health Statistics and the Social Security Administration (2000-2014)

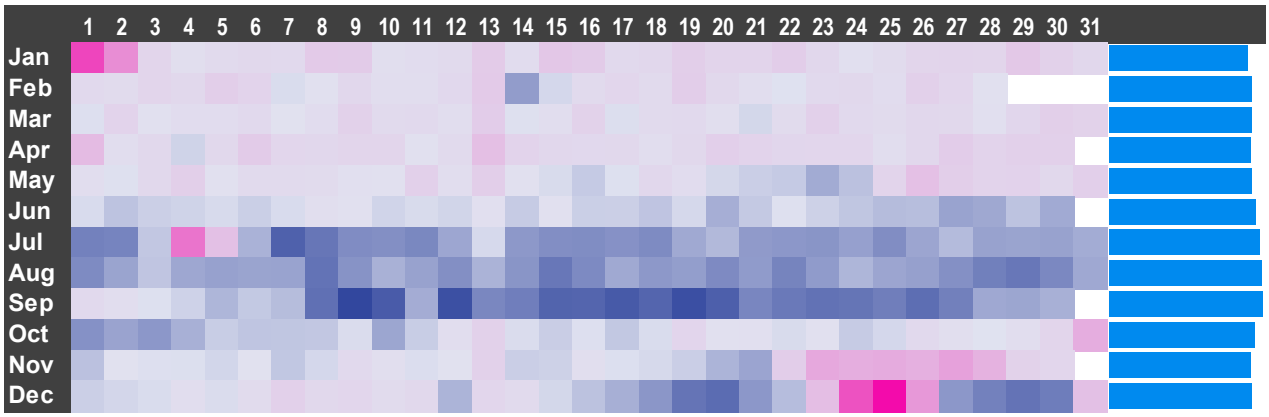
Sources:

Brewer, Lauren M, and James J Cochran. "August's Child Is...favoured by Fortune." Significance, June 2013, pp. 20–24.

https://time.com/4933041/most-popular-common-birthday-september/

https://github.com/fivethirtyeight/data/tree/master/births

US Birthday Distribution



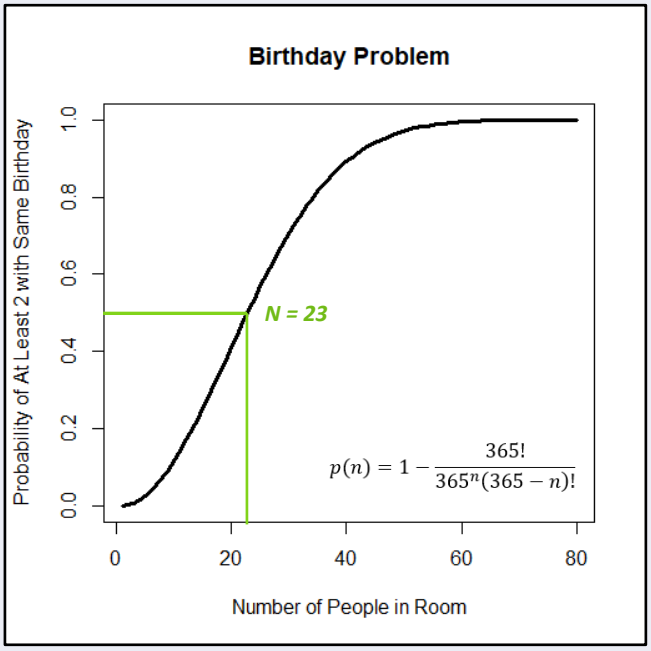
less frequent — *more frequent*

Birthday Paradox

A famous statistics problem asks what is the chance that in a room with *n* people at least two share the same birthday? Take a guess at how many people it would take for there to be at least a 50% chance that some people in the room share birthdays. Your initial guess was likely too high.

With 23 people in a room, there is about a 50% chance that some will share a birthday, and with 70 people it's almost certain (99.9%).

An interesting side-note: These calculations were based on the assumption the each day of the year in equally likely for a birthday, which does not seem completely accurate based on the US data analyzed. This example uses an assumption that seems reasonable to create a mathematical framework. Moreover, the number required for 50% when the distribution of birthdays is not uniform is 23 or fewer.



That's Improbable, Not Impossible

Consider a hypothetical example with 2,500 students where the most popular birthday was January 1st, which would seem strange since this birthday ranks low in the US. Moreover, let's say this most frequent birthday accounted for roughly 10% more students than the second most frequent birthday. In the US data the number of birthdays on the most frequent day was about 0.05% higher than the second most frequent. Through simulation with an assumption that the birthday distribution is uniform, the probability that January 1st is more than 10% higher than the second most frequent birthday was estimated to be slightly less than 0.001. In other words, for a group of 2,500 students January 1st would be 10% more common than the second most common birthday fewer than 1 in 1,000 times, by chance.

While our outcome happening by chance is not impossible, it is improbable. Thus, there may be another explanation other than chance. For example, January 1st may be used as a "default" birthday when processing student records.

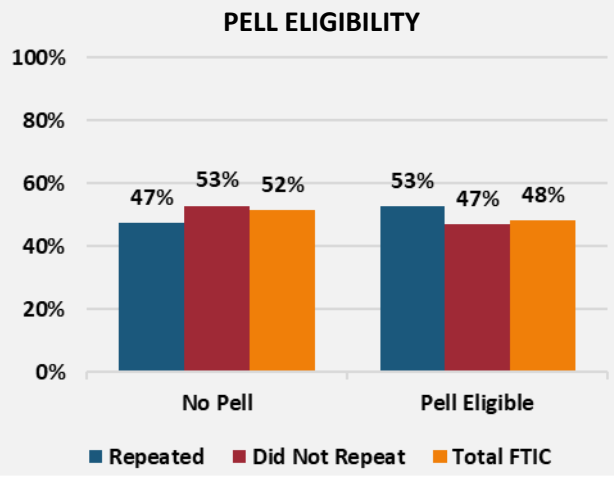
Repeats.

The first review of data on repeats provided an overview of the number of repeats, commonly repeated courses, and possible connections to success. In this next edition of "Repeats," we further explore the demographics of repeaters and potential predictors of repeats such as academic preparedness.

For this analysis, **first time in college (FTIC) students** were examined and divided into two groups: whether or not a first term course was repeated in a subsequent term. FTIC students included in the analysis spanned from 2010FL through 2020FL, including spring and summer FTIC cohort semesters. About 125,000 FTIC students were included. Percentages were calculated using the total number of students from each repeat status group, with about 1 in 4 FTIC repeating at least one first term course by the end of 2020FL.

PELL ELIGIBILITY

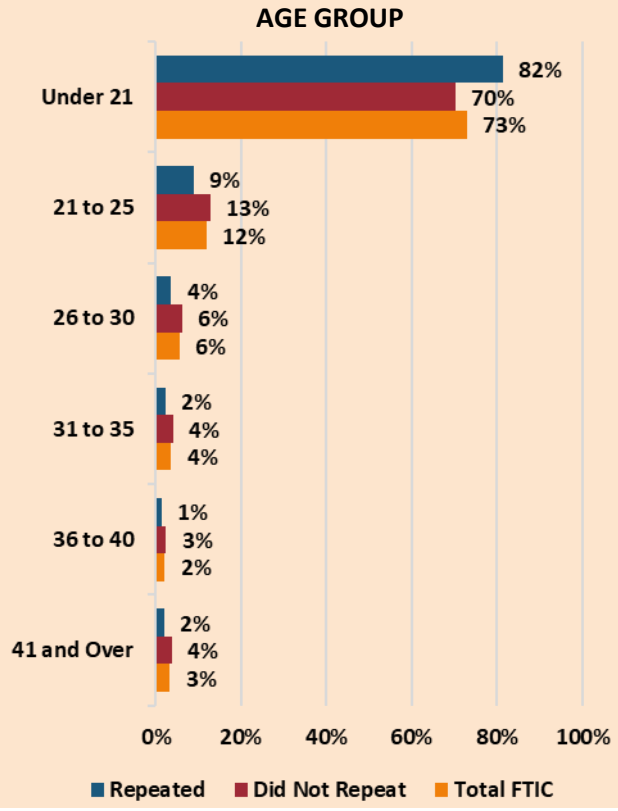
When looking at whether a student was Pell eligible or not Pell eligible, there was about a five-percentage point difference between the repeat status groups. Of the FTIC group who repeated a course in their first term, about 53% of students were Pell eligible, compared to about 47% of FTIC students who did not repeat a course in their first term.



AGE

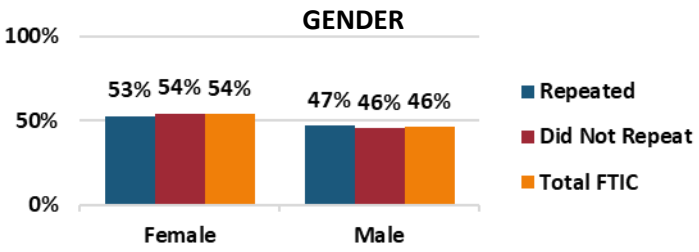
When looking at different age groups, there was about a twelve-percentage point difference between the repeat status groups for students under the age of 21. Of the FTIC group who repeated a course in their first term, about 82% of students were under the age of 21, compared to about 70% of FTIC students who did not repeat a course in their first term.

Age Group	*Not a Repeat*	*Repeat*
Under 21	70%	82%
21 to 25	13%	9%
26 to 30	6%	4%
31 to 35	4%	2%
36 to 40	3%	1%
41 and Over	4%	2%



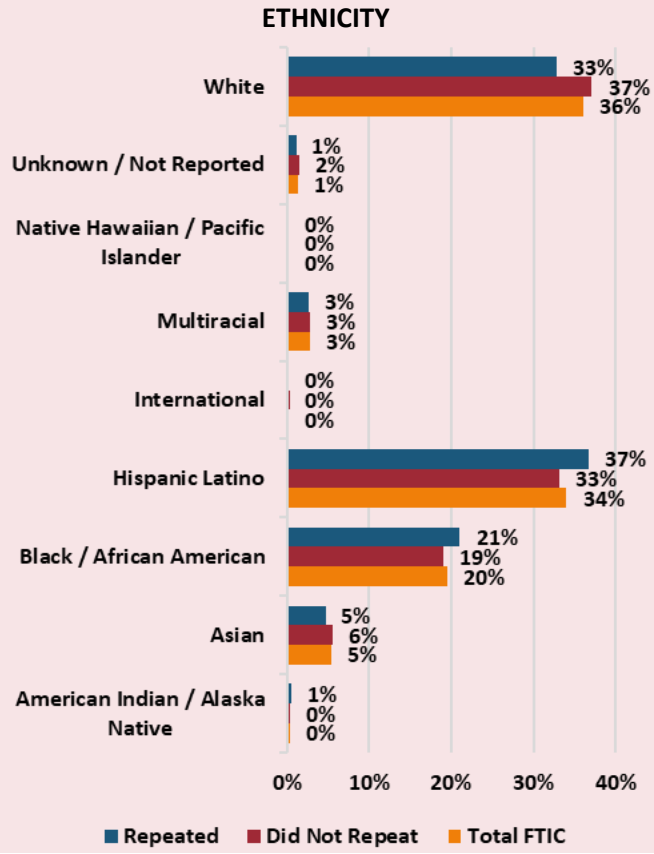
GENDER

There was about a one to two percentage point difference for both males and females between the two repeat status groups. Generally, both repeat group of students mirrored the overall distribution of FTIC male and female students.



ETHNICITY

When examining the data by ethnicity, a higher percentage of White students did not repeat a course in their first term (37%) compared to the repeated group (33%). Conversely, for both Black/African American and Hispanic Latino student groups, a higher percentage of each group repeated a course from their first term versus those who did not repeat a course. Other ethnic groups were comparable across the repeat status groups.



TSI STATUS & FIRST GENERATION

Finally, after looking at TSI status and first generation status, there was little difference between the groups. For all FTIC examined, about 62% were not TSI met upon entering their first term, while 38% were TSI met. The same ratios were observed in the two repeat categories.

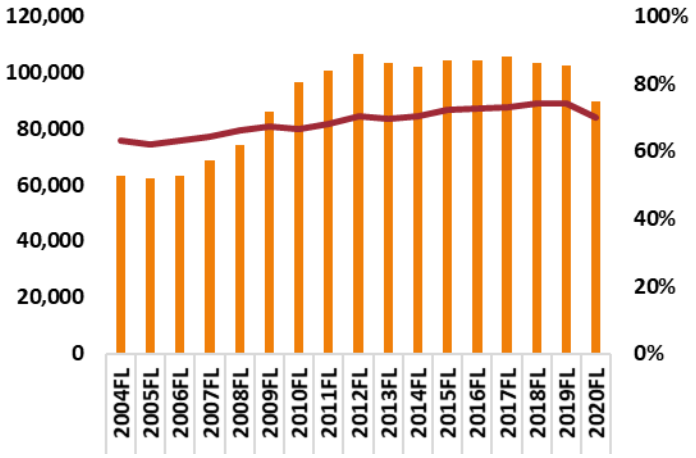
First generation students from both repeat status groups comprised about 29-30% of the FTIC within their respective groups. Within the group who did repeat a course, about 48% of students were not first generation, compared to about 47% of students within the non-repeater group.

In conclusion, if this past pandemic year is any testament to the unpredictability of life, having the opportunity to retake a course may be the exact lifeline a student needs to continue his or her educational career. The prospect of improving a W grade to an A grade is appealing for students, faculty, and TCC as a whole. **Overall, compared to FTIC non-repeaters, FTIC repeaters tended to be younger (under 21) and were more likely to be Pell eligible.**

An interesting phenomenon that may be correlated to the number of repeated courses is the increase in the number of successful grades per term. When looking at all grades for fall terms since 2004FL, the percent of successful course outcomes has increased from about 63% to about 70% in 2020FL.

Stay tuned for a deeper dive into the grade distribution related to repeated courses in our next edition of Repeats.

TOTAL SUCCESSFUL GRADES & SUCCESS RATE *



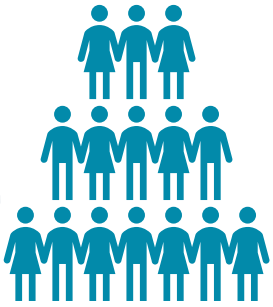
** Includes all students, not just FTIC*

Sources: ODR, ST Student Enrollment Data (excludes labs, audits, credit type N)

Tarrant County by the Numbers

DEMOGRAPHICS

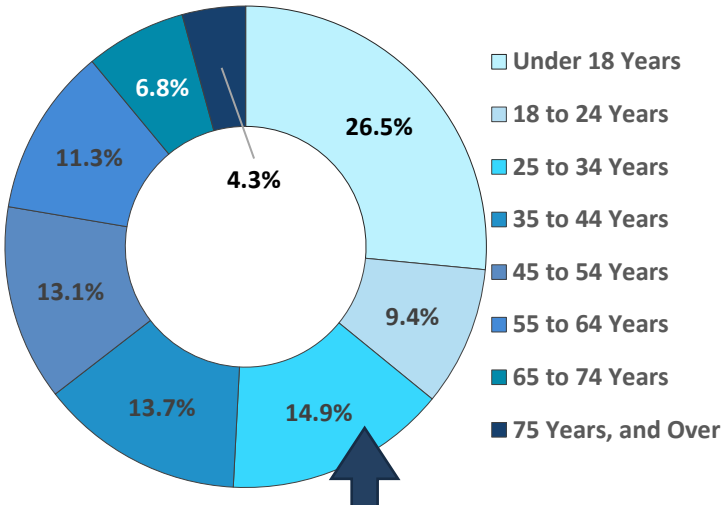
2,049,770
Estimated Population
*ACS 2015-2019



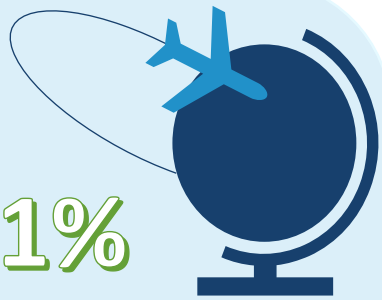
48.9% Male **51.1%** Female

1.7%
Average Annual Growth Rate since 2009

Hispanic (of any race) 28.8%



34.4 Years
Median Age



16.1%
Foreign Born

Source: Jobs EQ; Data from 2019-2020 Q3 unless otherwise noted.

Tarrant County by the Numbers

ECONOMICS & EDUCATION

Poverty Level (of all people)

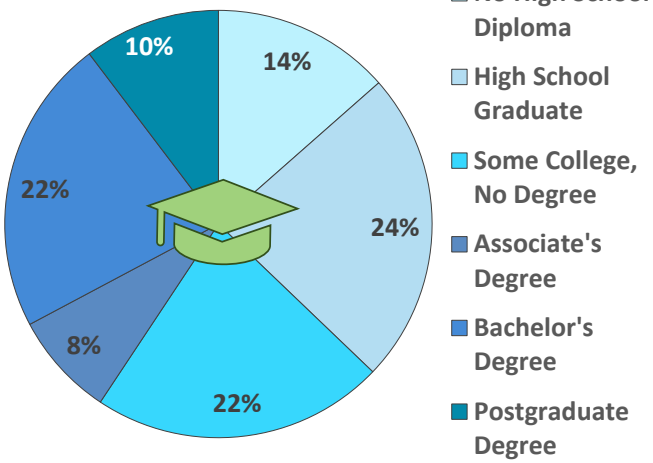
11.9%

Average Annual Wage

$ 57,697
As of 2020Q3

3.4%
Per worker
From 2019Q3 to 2020Q3

Educational Attainment*



*Ages 25-64 years

Largest Occupation Groups

* As of 2020Q3

1. Office and Administrative Support
2. Transportation and Material Moving
3. Sales and Related

Fastest Growing Occupation Group

Healthcare Support

2.8%
Estimated Annual Growth

Projected Annual Average Job Growth by Training Required

- Postgraduate Degree — 1.7% * As of 2020Q3
- Bachelor's Degree; 2- year Degree or Certificate — 1.5% * As of 2020Q3

Moderate – term, On-the-Job Training, no experience, no award

0.9%
* As of 2020Q3

All Levels

1.3%
* As of 2020Q3

Source: Jobs EQ; Data from 2019-2020 Q3 unless otherwise noted.

Wait, Can't Release That Information

FERPA

Robert Lorick

In Higher Education, many are familiar with the term FERPA, the Family Education and Privacy Right Act. FERPA legislation was designed to protect the privacy of student educational records. It applies to all educational institutions that receive funds from an applicable program of the Department of Education.

What does it mean?

Students control their educational records and decide if someone can see their personally identifiable information (PII), their grades, their academic standing, and so on. In most cases, these rights include parents not being able to see their student's records without the written permission of the student.

A minimal amount of information is considered "Directory Information" that can be publicly released. The TCC directory policy, allowable under FERPA, states:

"TCC will provide name, current address, academic program code (major), dates of attendance, full-time or part-time enrollment status, degrees and awards received and dates granted, previous educational institution(s) attended, and eligibility and participation in officially recognized activities and sports for students who have not restricted the release of directory information."

Current address, however, is considered restricted directory information which is only released if a legitimate educational interest is established. ***Email addresses and phone numbers are not considered directory information and will not be released.*** Lastly, students can choose to opt out of the use of their basic information as directory information at TCC.

Students have rights, and FERPA ensures those rights are being respected.

Get in Touch

Tarrant County College
SUCCESS WITHIN REACH.

If you've got questions, we've got answers.
Please give us a call or shoot us an email with your ideas and inquiries!

"It is really wonderful how much resilience there is in human nature. Let any obstructing cause, no matter what, be removed in any way, even by death, and we fly back to first principles of hope and enjoyment."

— Bram Stoker, *Dracula*

As we reflect on these past months of the global pandemic, words that come to mind are grace, resilience, adaptability, and gratitude. Whether it's teaching students or collaborating with colleagues over a screen, managing odd work hours while homeschooling children, caring for family, or enduring the immeasurable weight of grief, we have arrived here now together, much in part due to everyone's empathy and flexibility. We, at IR, are grateful for your continued efforts towards equity and student success at TCC. Indeed, we are One College!

- Team IR | One IT

TCC Trinity River West Fork 3200 | 817.515.5900

institutional.research@tccd.edu

www.tccd.edu/about/research/institutional-intelligence-and-research