

Online Course-Taking Behavior

March 25, 2020

This analysis was produced by OPEIR in response to a request by Provost Jerold Hale. Results are not necessarily generalizable and attempts to use results outside the scope of this project should be avoided.

Key Findings

- Most of the students who choose to take online courses come from a health science or social science program. This is likely due to these majors having at least one core course that is only taught through online instruction.
- While the majority of online course-takers are seniors, most of the courses frequently taken online are general education courses. The most popular online course, *Introduction to Computing*, is taught only through online instruction and is a popular elective course for Communication majors.
- Students are earning lower grades and are withdrawing at a higher rate in online courses than face-to-face courses. Math classes in particular can have up to an increased twenty percent DFW rate in their online sections compared to traditional sections. These performance differences appear greater in courses students are expected to take in their first 30-45 credit hours (i.e. freshman and sophomore).

Population of Interest

This report reviewed undergraduate students enrolled in a baccalaureate program and participated in at least one online course for the 2018-2019 and 2019-2020 academic year. Three-year online course-taking trends for undergraduate programs were also examined for changes in course enrollment as several core courses moved to an online teaching format. Online courses are taught via online-only instruction (i.e. eighty percent or more of required face-to-face classroom attendance and participation is replaced with technology enhanced instruction) or hybrid instruction (i.e. between thirty to seventy-nine percent of the class is through technology enhanced instruction). For the past two academic years, hybrid instruction made up approximately fifteen percent of all online undergraduate courses (Table 1). For the purposes of this report, online course enrollment is a combination of online-only and hybrid course sections.

Table 1. Online and Hybrid Instruction Sections Taught per Term

Academic Term	Online Instruction	Hybrid Instruction	Grand Total
Summer 2018	151	12	163
Fall 2018	199	46	245
Spring 2019	220	48	268
Summer 2019	162	8	170
Fall 2019	241	56	297
Spring 2020	277	53	330

Online Enrollment Demographics

As the number of online sections have increased over time, the number of undergraduate students taking at least one online course have also increased (Table 2). The highest concentration of undergraduate students taking online courses in the last three years are seniors (48.82%), followed by juniors (24.54%), then sophomores (18.36%) and freshmen (8.28%). On average, over half of all undergraduate UTC students take at least one online course each semester (Table 3).

Table 2. Online Enrollment by Term and Classification

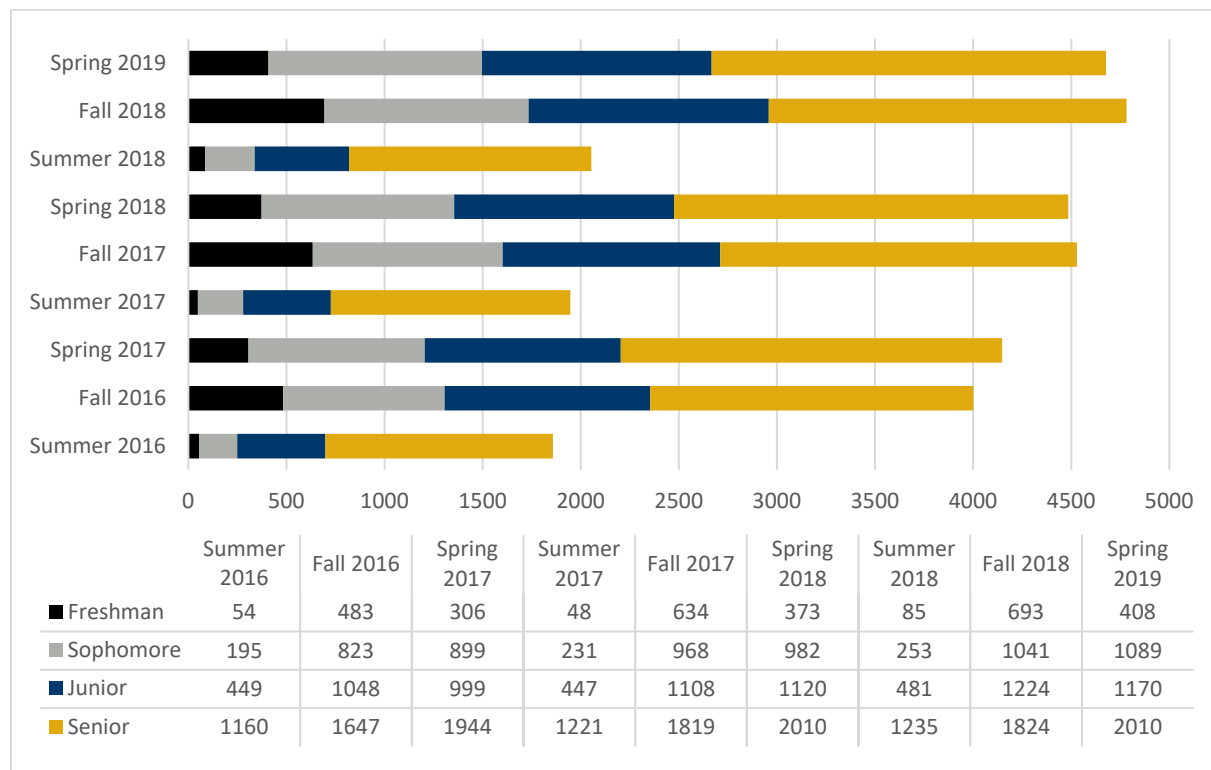
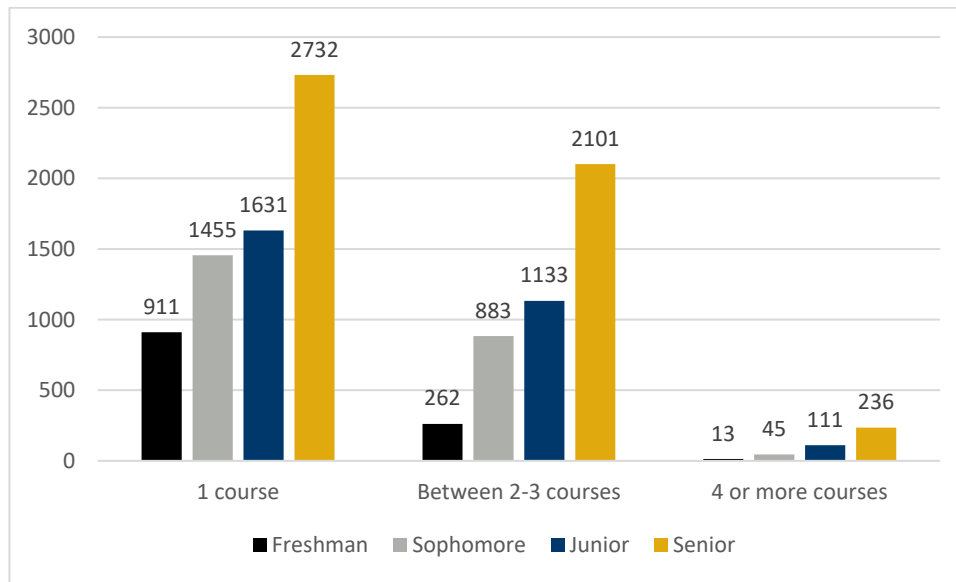


Table 3. AY2018-19: Number of Online Courses Taken by Classification



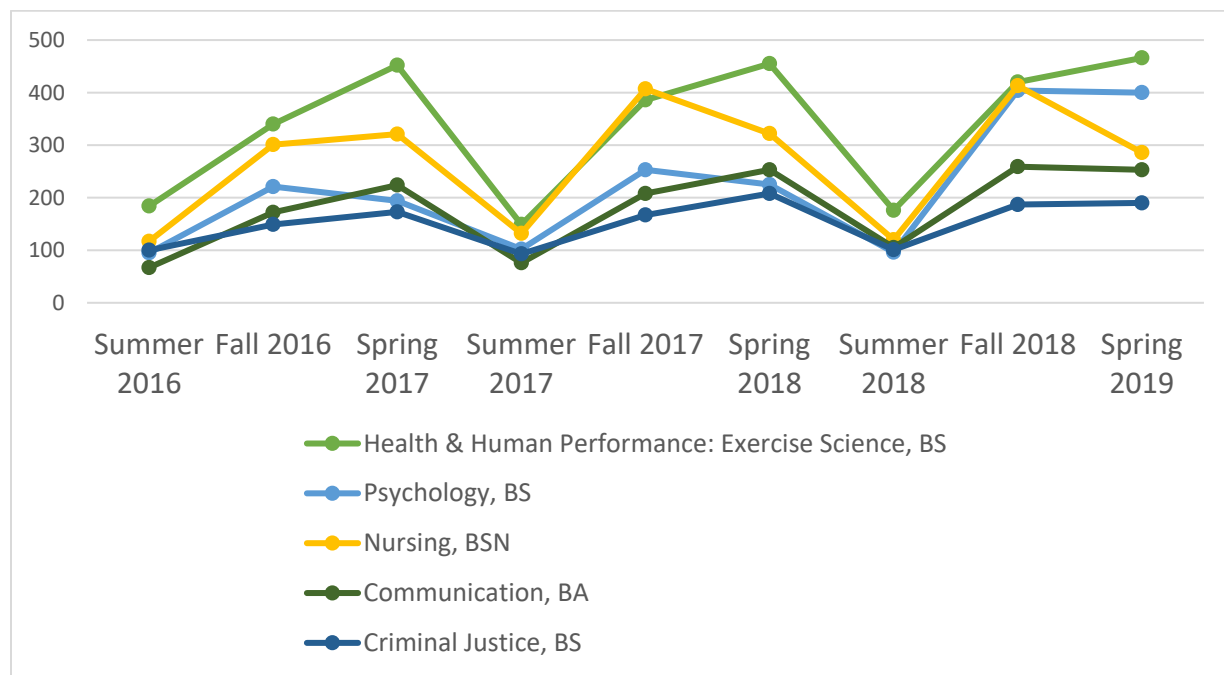
The programs with the greatest number of students taking online courses are composed with a mixed pedagogy curriculum of on-ground courses and at least one core class provided via online instruction (Table 4). This holds true for nine out of the ten programs with the highest number of students completing at least one online course. *Personal Health* (HHP 1000) is a prerequisite core class for Health and Human Performance majors that is only taught through online instruction for the fall and spring semesters and one face-to-face section taught in the summer. Table 5 shows that online course-taking for Psychology students significantly increased in AY2018-19 when one of their core classes, *The Profession of Psychology* (PSY 2070), changed from face-to-face instruction to online only in fall 2018.

The BSN Nursing program is the only undergraduate program with an online-only program degree track, making this program the third highest in number of students taking at least one online course in AY2018-19. After moving to a fully online pedagogy in fall 2018, the RN to BSN gateway program allows working registered nurses to receive their BSN through online instruction. These students do not take any on-ground traditional courses during their enrollment at UTC and make up twenty-one percent of the BSN program population listed in Tables 4 and 5 (n=116).

Table 4. Top 10 Undergraduate Programs Taking Online Classes in AY2018-19

Degree Program	Took at least 1 Online Class
Health & Human Performance: Exercise Science, BS	588
Psychology, BS	577
Nursing, BSN	545
Communication, BA	413
Criminal Justice, BS	306
Business: Marketing, BS	305
Biology: Preprofessional, BS	290
Business Management, BS	247
Business: Accounting, BS	180
Mechanical Engineering, BSME	178

Table 5. Three-year Online Class Participation by Program



The Growth of Online General Education

A significant reason across all programs for enrolling in an online course appears to be completing the 40-41 hour general education requirement. As shown in Table 6, seven out of the ten top online classes taken in AY2018-19 were general education courses. However, the course with the highest online enrollment, *Introduction to Computing* (CPSC 1000), is an online-

only instruction course that does not provide general education credit. While not a general education course, it is primarily taken by Communication students as an elective course for their program (N=142).

When hybrid courses are isolated, the distribution of sections taught is split between *Rhetoric and Composition II* (ENGL 1020) and 2000-3000 level core classes for Education and Business programs. Overall, *Rhetoric and Composition II* is the second most frequently registered online class with seventy-seven percent of sections taught through hybrid instruction (Table 7). Four out of the five top hybrid courses are taught only in a hybrid format, including a general education option, *The Family Experience: Matters of Ethnicity, Race, Class and Gender* (SOCW 2100).

Table 6. Top 10 Online Courses for AY2018-19

Course Name	Course Number	Offers Face-to-Face Sections	General Education Course	Online Sections Taught	Online Enrolled	Face-to-Face Sections Taught	Face-to-Face Enrolled
<i>Introduction To Computing</i>	CPSC 1000	No	No	13	544	N/A	N/A
<i>Rhetoric and Composition II</i>	ENGL 1020	Yes	Yes	26	432	57	1,116
<i>Personal Health</i>	HHP 1000	Yes	No	9	424	1	21
<i>World History Origins to 1400</i>	HIST 1110	Yes	Yes	14	406	9	396
<i>Introduction to Sociology</i>	SOC 1510	Yes	Yes	9	373	10	626
<i>Introductory Statistics</i>	MATH 2100	Yes	Yes	9	343	22	866
<i>Psychology as a Profession</i>	PSY 2070	No	No	2	315	N/A	N/A
<i>World History 1400-Present</i>	HIST 1120	Yes	Yes	10	291	11	565
<i>Calculus For Management, Life & Social Sciences</i>	MATH 1830	Yes	Yes	8	271	20	785
<i>American Politics</i>	PSPS 1010	Yes	Yes	4	271	5	218

Table 7. Top 5 Hybrid Instruction Courses for AY2018-19

Course Name	Course Number	Offers Face-to-Face Sections	General Education Course	Hybrid Sections Taught	Hybrid Enrolled
<i>Rhetoric and Composition II</i>	ENGL 1020	Yes	Yes	20	340
<i>Families: Home, School, Community Partnerships</i>	ECHD 2460	No	No	7	157
<i>The Family Experience: Matters of Ethnicity Race, Class and Gender</i>	SOCW 2100	No	Yes	4	119
<i>Intro to Operating Systems</i>	CPSC 2800	No	No	4	109
<i>Designing Instruction for the Inclusive Classroom</i>	EDUC 3170	No	No	4	97

Online options for general education courses have been steadily increasing with each year together with an overall growth for all general education sections taught (Table 8). Currently, there are no online or hybrid-style instruction options for upper-level general education courses. Nearly all online general education courses provided are offered through online-only instruction. The only courses that offer hybrid sections are for *Rhetoric and Composition I and II* (ENGL 1010 and 1020) and *The Family Experience: Matters of Ethnicity, Race, Class and Gender* (SOCW 2100).

Table 8. Online General Education Sections Offered*

Academic Term	Number of Online Sections	% of Total General Education Sections	Total General Education Sections Taught
Summer 2018	51	60.71%	84
Fall 2018	70	11.84%	591
Spring 2019	84	17.80%	472
Summer 2019	53	65.43%	81
Fall 2019	106	17.52%	605
Spring 2020	105	21.30%	493

*All online General Education courses are 1000-2000 level courses

As of the 2019-2020 academic year, undergraduates can complete their general education credit requirement for graduation fully online. With new online sections for the laboratory-embedded *Life on Earth* (BIOL 1050) and *General Physics* (PHYS 1030/1030L & 1040/1040L), there are enough credit hours and class diversity to satisfy the criteria for each general

education category (Table 9). Currently, larger concentrations of online sections are focused to assist freshman in completing their Rhetoric and Writing I/II and Mathematics criteria within their first year.

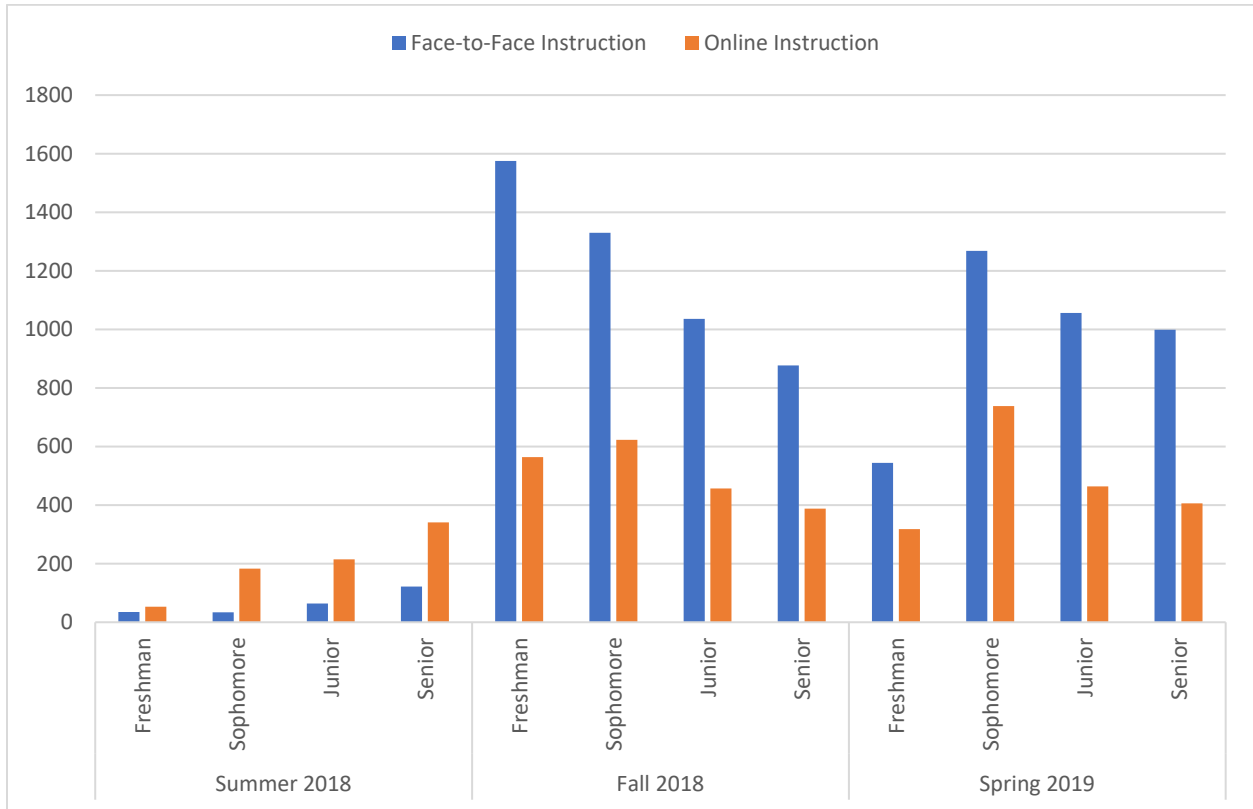
Table 9. Number of Available Online General Education Sections by Category*

General Education Category	Summer 2019	Fall 2019	Spring 2020
Rhetoric and Writing I	0	17	3
Rhetoric and Writing II	1	8	18
Fine Arts and Humanities - Historical Understanding	6	18	17
Fine Arts and Humanities - Literature	3	9	8
Fine Arts and Humanities - Thoughts, Values and Beliefs	3	3	4
Fine Arts and Humanities - Visual & Performing Arts	3	9	12
Natural Science - Laboratory	4	1	2
Natural Science - Non-Laboratory	6	10	10
Behavioral and Social Science	12	14	16
Mathematics	8	10	7
Statistics	6	6	6
Non-Western Culture	1	1	2

**Categories may contain courses eligible for other categories*

The largest group of students taking online general education courses throughout the academic year are sophomores (32.5%), followed by an equal split between juniors and seniors (23.9%), and then freshmen (19.7%; Table 10). This is unsurprising due to the large amount of online sections available for Fine Arts and Humanities and Social Sciences. The first online classes most freshmen tend to register for are Rhetoric and Composition I and II (ENGL 1010/1011 and 1020).

Table 10. AY2018-19: Undergraduates Enrolled in at Least One Online General Education Course



Online Impacts for Student Outcomes

When comparing online course performance to face-to-face courses, several differences emerge, especially for freshmen and sophomores. Most of the students who complete at least one online course finish the semester with a similar or slightly higher term GPA than students who complete only face-to-face courses. There are a few groups who earn a poorer GPA than face-to-face instruction. Table 11 shows that sophomores who took four or more online courses in summer 2018 and spring 2019 had an average GPA difference of -0.49 and -0.34, respectively. Freshmen in fall 2018 who took two to three online courses also show a noticeably lower term GPA. The same drop also appears across three years as shown in Table 12.

Table 11. Average Term GPA Comparisons for AY2018-19

Academic Term/Classification	Face-to-Face Instruction Only	1 Online Course	2-3 Online Courses	4+ Online Courses
Summer 2018	3.106	3.140	3.131	3.139
Freshman	3.054	2.879	3.056	3.250
Sophomore	2.876	3.167	3.075	2.390
Junior	3.055	3.128	3.114	3.142
Senior	3.165	3.168	3.147	3.263
Fall 2018	2.893	2.935	3.070	3.182
Freshman	2.643	2.628	2.479	3.319
Sophomore	2.872	2.843	2.923	3.348
Junior	2.865	2.932	3.054	3.160
Senior	3.098	3.145	3.254	3.147
Spring 2019	2.915	2.928	3.113	3.076
Freshman	2.106	2.094	2.217	2.591
Sophomore	2.847	2.864	3.012	2.504
Junior	2.856	2.923	3.047	3.179
Senior	3.135	3.170	3.307	3.174

Table 12. Three-Year Average Term GPA Comparisons for Freshman Students

Academic Term	Face-to-Face Instruction Only	1 Online Course	2 Online Courses	3+ Online Courses
Fall 2016	2.710	2.726	2.504	2.435
Spring 2017	2.262	2.208	2.568	2.590
Fall 2017	2.684	2.722	2.570	2.222
Spring 2018	2.171	2.216	2.035	2.156
Fall 2018	2.643	2.628	2.554	2.119
Spring 2019	2.106	2.094	2.194	2.359

On average, students enrolling in at least one online course register for more total credit hours per semester than traditional courses only. Juniors and seniors taking online courses are attempting and earning more credit hours (Table 13). Table 14 shows that withdrawal rates for online classes are only slightly higher than traditional courses as well for both groups. Freshman students, however, are attempting the same amount of credits but are earning four percent less credit hours if they take one or more online courses. Withdrawal rate for

freshmen is slightly higher for online courses as well with a ten percent drop rate versus seven percent in face-to-face courses.

Table 13. Fall 2018 Credits Earned

Classification	Average Credits Enrolled	Average Credits Earned	% Credits Earned
Freshman			
Traditional Instruction Only	14.7	12.0	81.85%
One or more Online Courses	14.8	11.5	77.58%
Sophomore			
Traditional Instruction Only	14.1	12.3	87.16%
One or more Online Courses	14.4	12.5	86.85%
Junior			
Traditional Instruction Only	13.5	11.4	84.75%
One or more Online Courses	14.2	12.6	89.05%
Senior			
Traditional Instruction Only	12.9	11.9	92.66%
One or more Online Courses	13.5	12.6	93.49%

Table 14. AY2018-19 Withdrawal Rate Comparison

AY2018-19 Withdrawal Rate Comparison		
Classification	Online Instruction Withdrawal Rate	Traditional Instruction Withdrawal Rate
Freshman	10.35%	6.87%
Sophomore	5.86%	4.47%
Junior	5.70%	4.98%
Senior	3.98%	2.89%

There is a negative difference in grade distribution associated with the increased withdrawal rates for the top online course sections when compared to traditional sections taught. Out of the top ten classes offering online instruction in fall 2019, only three have a lower online DFW rate than their face-to-face sections: *World History Origins to 1400* (HIST 1110), *World History 1400-Present* (HIST 1120), and *Introduction to Sociology* (SOC 1510; Table 15).

Three of the most important grade distributions are for ENGL 1020 and the two math courses, MATH 1830 and MATH 2100. As one of the first hybrid-instruction courses students may take, *Rhetoric and Writing II* has a significantly larger DFW rate for online and hybrid sections compared to face-to-instruction (hybrid sections DFW, 26.92%; online sections DFW 19.7%).

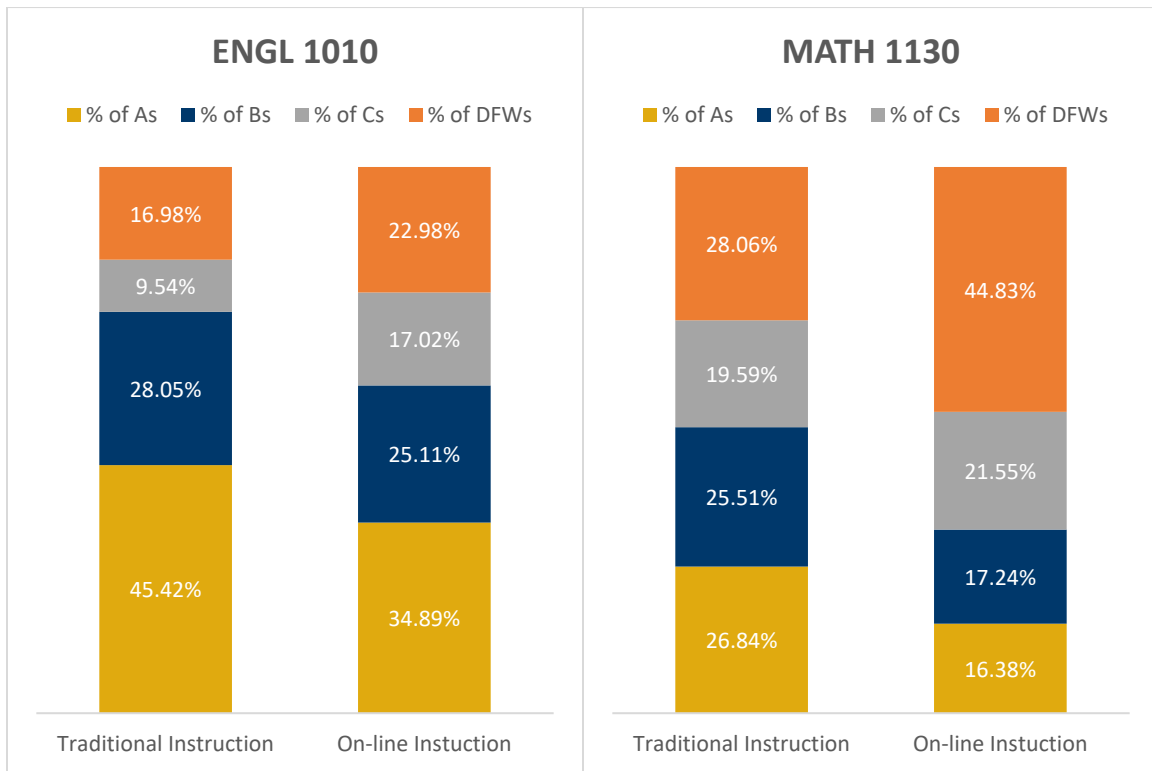
For MATH 1830, online sections have a ten percent higher DFW rate, whereas MATH 2100 has close to a twenty percent rate difference.

Table 15. Fall 2019 Grade Distribution for Online and Face-to-Face Instruction

Course/ Instruction Method	Total Students	Total As	% of As	Total Bs	% of Bs	Total Cs	% of Cs	Total DFWs	% of DFWs
ENGL 1020	501	171	34.13%	145	28.94%	94	18.76%	91	18.16%
Traditional Instruction	357	137	38.38%	101	28.29%	62	17.37%	57	15.97%
Online Instruction	144	34	23.61%	44	30.56%	32	22.22%	34	23.61%
HIST 1110	455	99	21.76%	140	30.77%	90	19.78%	126	27.69%
Traditional Instruction	276	54	19.57%	81	29.35%	55	19.93%	86	31.16%
Online Instruction	179	45	25.14%	59	32.96%	35	19.55%	40	22.35%
SOC 1510	552	181	32.79%	186	33.70%	104	18.84%	81	14.67%
Traditional Instruction	363	82	22.59%	143	39.39%	79	21.76%	59	16.25%
Online Instruction	189	99	52.38%	43	22.75%	25	13.23%	22	11.64%
MATH 2100	626	162	25.88%	169	27.00%	119	19.01%	176	28.12%
Traditional Instruction	467	141	30.19%	132	28.27%	86	18.42%	108	23.13%
Online Instruction	159	21	13.21%	37	23.27%	33	20.75%	68	42.77%
HIST 1120	454	158	34.80%	141	31.06%	67	14.76%	88	19.38%
Traditional Instruction	307	72	23.45%	107	34.85%	57	18.57%	71	23.13%
Online Instruction	147	86	58.50%	34	23.13%	10	6.80%	17	11.56%
MATH 1830	487	147	30.18%	96	19.71%	100	20.53%	144	29.57%
Traditional Instruction	395	120	30.38%	81	20.51%	85	21.52%	109	27.59%
Online Instruction	92	27	29.35%	15	16.30%	15	16.30%	35	38.04%
PSPS 1010	250	69	27.60%	98	39.20%	43	17.20%	40	16.00%
Traditional Instruction	130	49	37.69%	48	36.92%	18	13.85%	15	11.54%
Online Instruction	120	20	16.67%	50	41.67%	25	20.83%	25	20.83%

In order to focus on courses that primarily freshmen take to determine online effects, this study chose to examine two select gateway courses. Gateway courses are courses all students take within their first 30-45 credit hours that foster critical thinking and analytic skills used in their academic degree. Performance in these courses can provide a measure for overall academic success. For UTC, these courses are *English Composition and Rhetoric I* (ENGL 1010 and 1011) and *College Algebra* (MATH 1130). Based on the most recent fall term, students who take these gateway courses via online instruction receive a lower grade distribution (Table 16). This is especially noticeable for students taking *College Algebra* through online instruction with a DFW rate of 44.83% compared to 28.06% for traditional instruction courses, matching the difference in other math courses. The rate of lower grades in these courses, as an OPEIR colleague recently reported in a [previous analysis](#), could lead to a negative effect on student outcomes, especially for students with a lower measure of academic readiness.

Table 16. Fall 2019 Grade Distributions for ENGL 1010 and MATH 1130



Conclusion

As our university continues to grow and change with the needs of the community, we must make certain to continually improve the quality of our instruction across all mediums. Face-to-face instruction remains the primary course method for students as it is the most provided method of instruction. Although online courses seem to provide small benefits to upperclassmen, an evaluation on online instruction to freshmen and sophomores is necessary to determine factors reducing their academic performance in online classes.

Freshman students taking required introductory courses via online or hybrid instruction are achieving lower grades than taking the same class in a face-to-face setting. This difference is most prominent in mathematics courses. One current speculation is that the higher demand of analytical skills for courses such as mathematics may be more difficult to provide in an online format. Future directions should consider both student factors (e.g. difficulty adjusting to or participating in an online delivery platform) and instructor and course factors (e.g. availability/accessibility, course expectations) for possible interactions.