



Course Type Analysis

This report explores course grade differences by student characteristics (first generation, minority status, and low-income [Pell] status) between course type (in person/online). The purpose of this report is to explore if historically underrepresented students have a larger difference in grade points for online courses verse in-person courses. From an advising perspective it is important to know if certain groups of students perform at disproportionately lower levels in online courses compared to in person courses.

Executive Summary

Overall, undergraduates receive a higher average grade point for in-person courses compared to online courses, but course grades varied significantly by upper/lower level course division and term. Students who took online lower level courses received higher grades on average than students who take lower level courses in person.

- Students who took online upper level courses received lower grades on average than students who take upper level courses in person.
- Students who took online courses in the summer received the lowest average course grade points, while students who took online courses during fall terms have higher average grade points than those students who take in person fall courses.
- These results suggest the importance of evaluating demographic gaps by specific course.

The performance gap (number of course grade points on average that non-minorities, continuing generation, or non-Pell recipients receive higher than minorities, first generation, and Pell recipients respectively) also varied by course format.

- Overall, the minority gap is higher for online students than in person students.
- Conversely, the first generation and low income gap is lower for online students than in person students.
 - This effect becomes magnified when examining upper level courses. The first generation gap disappears and actually reverses the traditional Pell gap when looking only at upper level courses.
 - This suggests students who are first generation or Pell recipients who take online courses compared to in-person courses may do better at a disproportionate rate than continuing generation students who take courses online, particularly for upper level courses.

A course level analysis of performance gaps underscored the variance of results.

- The minority performance gap increased for students in all four case studies when students took the course online compared to in person; however, the extent to which it increased was wide-ranging (.08 to .41 increase in grade points).
- The first generation performance gap increased for students who took either BMS 300 or SOC 100 online compared to in person, but the gap decreased for students who took BUS 205 or CO 300 online compared to in person.
- The low income performance gap increased for students who took BMS 300 online compared to in person, but had a slight decrease for students in SOC 100 and a substantial reversal for CO 300 and BUS 205.
- These findings validate the importance of assessing the impact of a course's format on performance at the course level and not just in aggregate.



Population

Undergraduate students enrolled in all undergraduate level courses that offered both in person (on-campus) and online (educational technology) course format during the past three academic years (AY2013-2015)¹. Additionally, four courses are presented as case studies: BMS 300, CO 300, SOC 100 and BUS 205. Students who received a final course grade of “W”, “NG”, or “I” were excluded for this analysis.

| # of Students | Lower division courses (56 courses) | Upper division courses (133 courses) | All courses (189 courses) |
|----------------------|--|---|----------------------------------|
| In Person | 110,842 | 60,768 | 171,610 |
| Online | 20,215 | 13,951 | 34,166 |
| Total | 131,057 | 74,719 | 205,776 |

Results are based on averaging the grade points (A+/A = 4.0, A- = 3.67, B+ = 3.33, B = 3.0, B- = 2.67, C+ = 2.33, C = 2, C- = 1.67, D = 1.0, F or U = 0). Please note the differences in the course size by course and course type (see Appendix A, Table 2 for course sizes). These large size contrasts make it difficult to extrapolate results that can be generalized and should be used with caution.

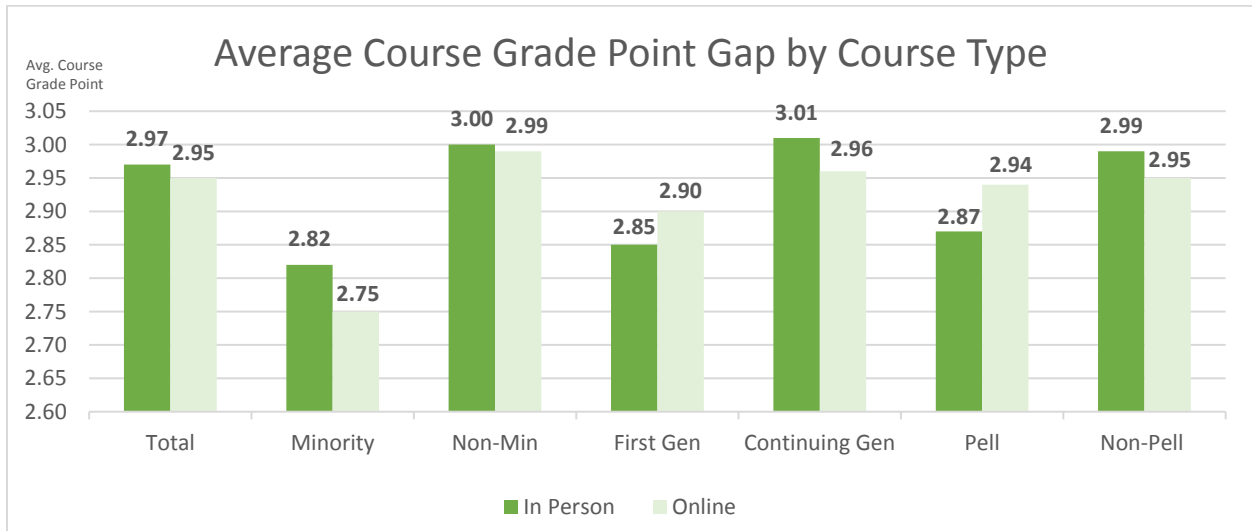
¹ If students took a course more than once, each attempt was included.



Course Type Comparisons

Figures 1 & 2 show the overall average course grade point (for all courses offered both in person and online during the AY2013-2015) for undergraduates by course type. For population size and more detailed descriptive statistics, see Tables 1a and 1b in Appendix A.

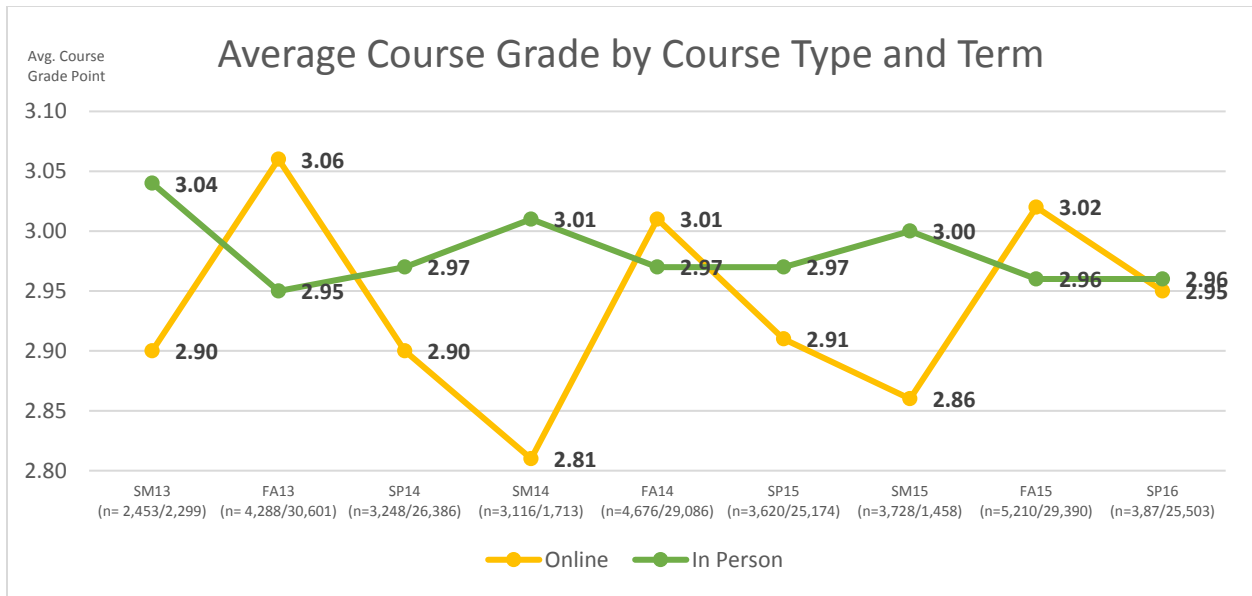
Figure 1. Overall average course grade by course type



- When looking at all undergraduate courses that are offered both in person and online in aggregate, students receive slightly lower course grades for online courses compared to in-person courses ($p < .01$). It is worth noting students who take in-person courses have a significantly higher average index (mean = 112.30) than students who took online courses (mean = 110.94, $p < .01$); however a multivariate analysis indicates that course type has a statistically significant positive association with course grade points even after controlling for students' index scores ($p < .01$).
- Minority students receive higher course grades when taking in-person courses compared to online courses ($p < .01$); however, first generation students and Pell recipients receive higher course grades online compared to in-person courses ($p < .01$).
- When looking at course grade points by course division (lower level vs. upper level), students who took online lower level courses do better than students who take lower level courses in person (.10 grade point gap, $p < .01$). The reverse is true for students in upper level courses—students do better on average when taking in-person courses compared to online courses (.20 grade point gap, $p < .01$) (see Table 1b).



Figure 2. Overall average course grade by course type and term



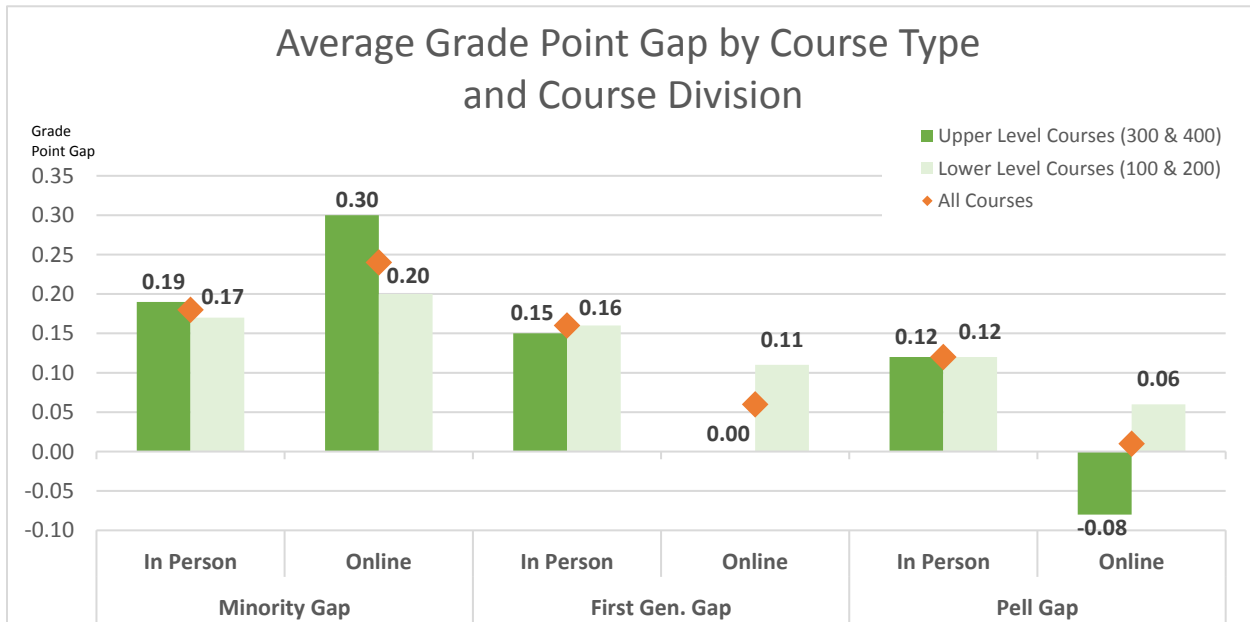
- Students who took online courses in the summer received the lowest average course grade points, while students who took online courses during fall terms have higher average grade points than those students who take in person fall courses.
- All terms significantly differ by course type with the exception of Spring 2016 ($p < .03$).

Grade Point Differences by Course Type and Course

This section explores the course grade gaps for enrolled undergraduate students. The gaps (grade point difference) are calculated by subtracting the traditionally underrepresented group (students with a minority ethnicity or race, are first generation, or are a Pell recipient) average course grade point from the average course grade point of, respectively, non-minority, continuing generation, and students who are not Pell recipients. The larger the magnitude of the difference, the greater the performance gap between the student characteristic groups. For example, a minority gap of .19 means non-minority students received a course grade that was on average .19 course grade points higher than minority students.



Figure 3. Overall average course grade point gap by course type, student characteristic, and course division



- Overall, the minority gap (number of course grade points on average that non-minorities receive higher than minorities) is higher for online students than in person students, which suggests a larger course performance discrepancy between non-minority and minority students for online courses than in person courses. This remains true when looking just at upper level courses (.11 grade point difference) and lower level courses (.03 grade point difference) despite the gap being much smaller for lower level courses
 - For non-minorities, students do not significantly differ in their grades on average by course type (.01 grade point gap); however, when examining minority students, students who took in-person courses received higher course grades than those minority students who took courses online (.07 grade points gap) ($p < .01$) (see Table 1a).
- In contrast to the minority gap, the first generation and Pell gap (number of grade points on average that continuing generation or non-Pell recipient students receive higher than first generation or Pell recipient students) show the performance gap decreases more for online courses than in person courses. This effect becomes magnified when examining upper level courses. The first generation gap disappears and actually reverses the traditional Pell gap when looking only at upper level courses (Pell recipients outperform non-Pell recipients by .08 grade points in upper level courses) (see Table 1a).
 - Undergraduates who are continuing generation have a higher course grade point average in person than online (.05 grade point gap, $p < .01$). Interestingly, the same .05 gap exists for undergraduates who are first generation students, but in the opposite direction. First generation students receive higher course grade points on average when taking the course online compared to in person ($p < .01$).
 - Similar to first generation students, students who are Pell recipients receive higher course grades on average for online courses compared to Pell recipients who take in-person courses ($p < .01$), while students who are non-Pell recipients do slightly better on average when taking in-person courses compared to online courses ($p < .01$).



Limitation

It is important to note that some courses have a high number of students, while other courses could have a very low number of students (see Table 2). Therefore, larger courses will have a greater impact on the direction of the results, which could imply a course specific effect. As you see above with the variance by term, student characteristic, and even course division, it is highly recommended to look at course type results at a course level instead of in aggregate. Below are four course case studies to provide examples of how results and conclusions can vary considerably by course.

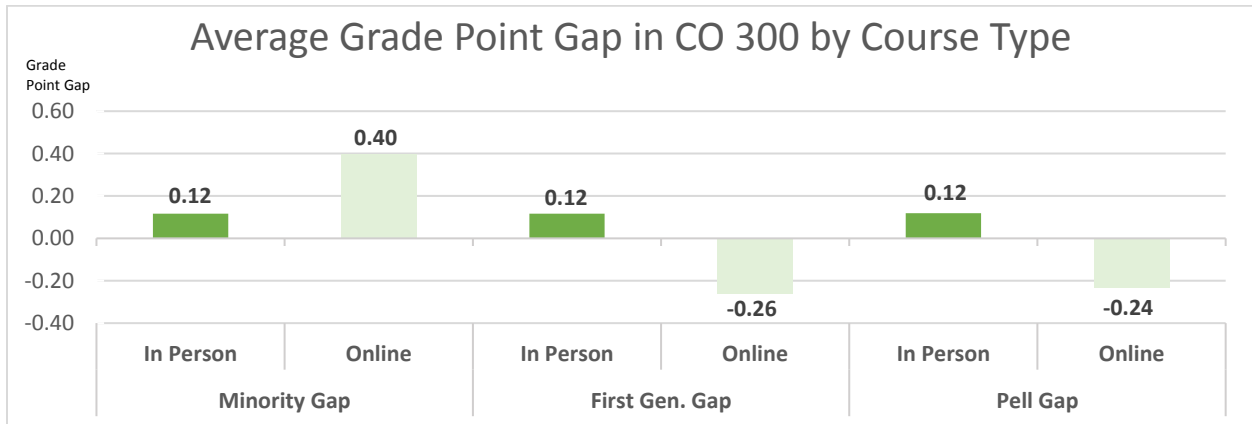
Course Case Studies

Figures 4-7 displays the average course grade difference between course types by course among undergraduates in the academic years 2013-2015. See Appendix A, Table 2 for course average course grade and the number of students in each course by course type



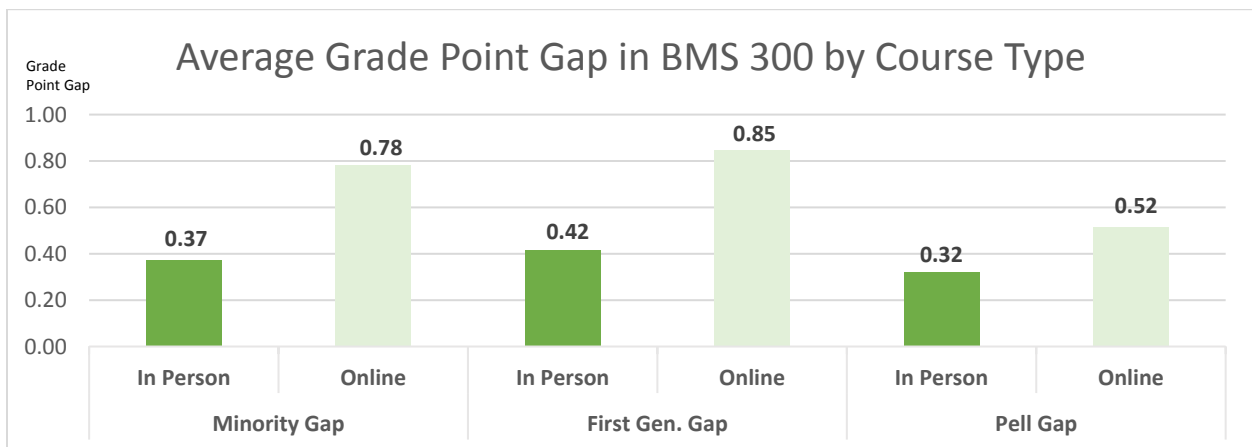
Upper Level Course Examples

Figure 4. Overall average course grade point gap by course type and student characteristic for Writing Arguments (CO 300)



- In support of our overall findings for upper division courses, the minority gap for students in CO 300 increased when students took CO 300 online compared to the minority course grade point gap that occurred when taking CO 300 in person. In contrast, the first generation gap and Pell gap reversed when students took CO 300 online compared to in person.
- First generation and Pell recipients received a quarter of a grade better on average than continuing generation and non-Pell recipients respectively when they took CO 300 online compared to in person; however, minority students received more than a quarter of a grade worse than non-minority students on average when taking CO 300 online compared to in-person.

Figure 5. Overall average course grade point gap by course type and student characteristic for Principles of Human Physiology (BMS 300)

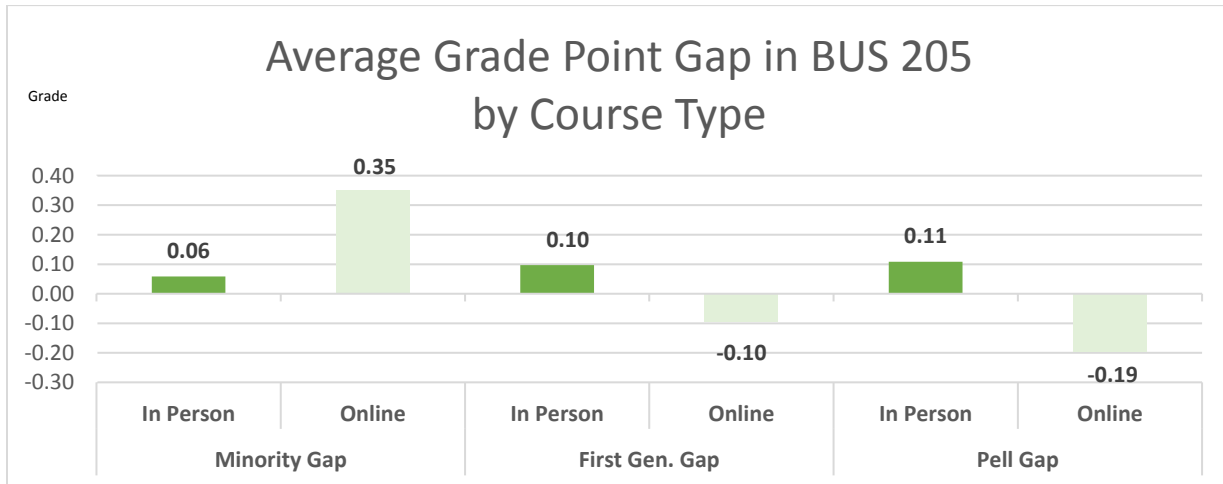


- Despite also being an upper level course, the results for BMS 300 did not support the same findings as CO 300 or the aggregate results. In fact, the minority gap, first generation gap, and low income gap all increased when comparing the course grade point for students who took BMS 300 online compared to in person. Further, the first generation performance gap was larger and had a larger gap increase from in-courses compared to the minority gap, which had not emerged in previous results.



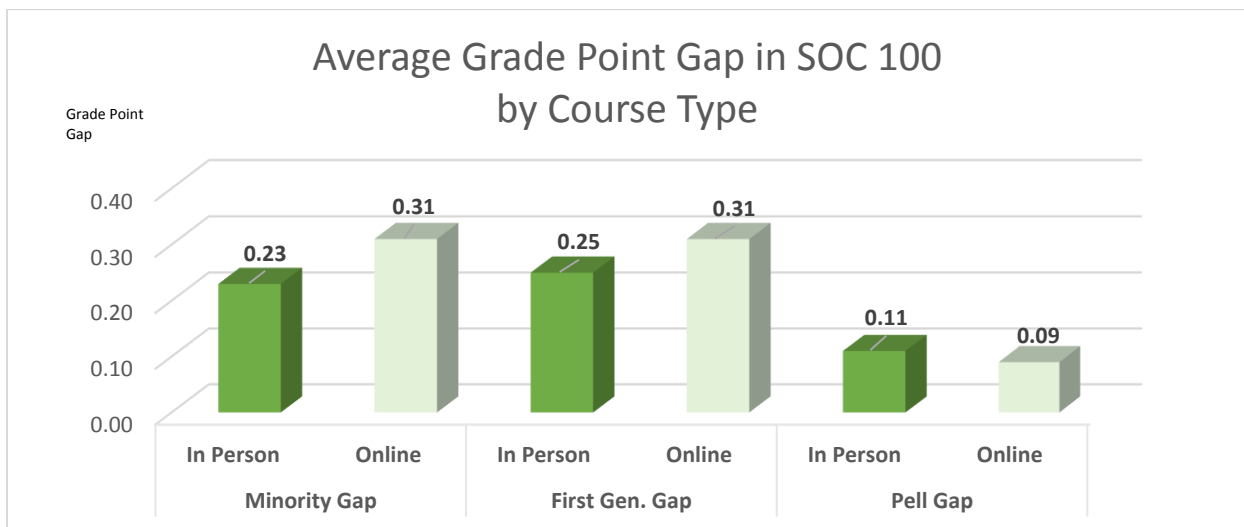
Lower Level Course Examples

Figure 6. Overall average course grade point gap by course type and student characteristic for Legal and Ethical Issues in Business (BUS 205)



- Consistent with other results, the minority gap for students in BUS 205 also increased when students took BUS 205 online compared to the minority course grade point gap that occurred when taking in-person courses.
- The first generation and low income gaps both reversed for the BUS 205 online course compared to in person. First generation students did better on average than continuing generation and non-Pell recipients respectively when they took BUS 205 online compared to in person.

Figure 7. Overall average course grade point gap by course type and student characteristic for Introduction to Sociology (SOC 100)



- In contrast to BUS 205, the first generation gap for SOC 100 increased for students who took it as an online course compared to an in person course, while the Pell gap slightly decreased but still found non-Pell recipients to outperform Pell recipients on their SOC 100 course grade.



Conclusion

These data show that students generally do better when taking in-person courses compared to online courses, especially for upper level courses. This result is even more pronounced for minority students compared to non-minority students; however, these results are not consistent for first generation and low-income students (compared to the demographic counterpart). Another important finding from this report is that the significant variation within these overall trends at the course level. It is important to access courses individually when determining if certain groups are at a particular disadvantage (in terms of grade points). For instance, in BUS 205 minority students performed better in person but first generation and low-income students have historically performed better online. In contrast, all of these demographic groups have lower performance gaps if they take BMS300 in person rather than online. Online courses are a good option for students seeking to complete specific courses in a more flexible matter; however, advisors should consider the historic performance gaps when discussing this option with students that are struggling with academics within their major (regardless of their demographic group).



Appendix A

Table 1a. Average course grade point for all courses offered both in person and online during the AY2013-2015) for undergraduates by course type

| Overall | # of Students | | Avg. Index | | Avg. Course Grade Points | |
|----------------|---------------|--------|------------|--------|--------------------------|--------|
| | In Person | Online | In Person | Online | In Person | Online |
| Total | 171,610 | 34,166 | 112.30 | 110.94 | 2.97 | 2.95 |
| Minority | 33,780 | 6,583 | 109.51 | 108.42 | 2.82 | 2.75 |
| Non-Min | 137,830 | 27,583 | 113.03 | 111.58 | 3.00 | 2.99 |
| First Gen | 44,705 | 9,599 | 109.59 | 108.73 | 2.85 | 2.90 |
| Continuing Gen | 126,905 | 24,567 | 113.23 | 111.76 | 3.01 | 2.96 |
| Pell | 39,347 | 7,804 | 110.11 | 109.31 | 2.87 | 2.94 |
| Non-Pell | 132,263 | 26,362 | 112.91 | 111.36 | 2.99 | 2.95 |

Table 1b. Average course grade point for all courses offered both in person and online during the AY2013-2015) for undergraduates by course type and course division (upper and lower)

| | Upper Level Courses | | | | Lower Level Courses | | | |
|----------------|---------------------|--------|--------------------------|--------|---------------------|--------|--------------------------|--------|
| | # of Students | | Avg. Course Grade Points | | # of Students | | Avg. Course Grade Points | |
| | In Person | Online | In Person | Online | In Person | Online | In Person | Online |
| Total | 60,768 | 13,951 | 3.02 | 2.82 | 110,842 | 20,215 | 2.94 | 3.04 |
| Minority | 11,532 | 2,624 | 2.87 | 2.58 | 22,248 | 3,959 | 2.80 | 2.88 |
| Non-Min | 49,236 | 11,327 | 3.06 | 2.88 | 88,594 | 16,256 | 2.97 | 3.08 |
| First Gen | 16,513 | 3,984 | 2.91 | 2.82 | 28,192 | 5,615 | 2.82 | 2.96 |
| Continuing Gen | 44,255 | 9,967 | 3.06 | 2.82 | 82,650 | 14,600 | 2.98 | 3.07 |
| Pell | 14,879 | 3,259 | 2.93 | 2.88 | 24,468 | 4,545 | 2.84 | 2.99 |
| Non-Pell | 45,889 | 10,692 | 3.05 | 2.80 | 86,374 | 15,670 | 2.96 | 3.05 |

**Table 2.** Course type comparison for courses that have at least 180 students in the ET version of the course

| COURSE | Online | | In Person | |
|----------------|------------|-------------------------|-------------|-------------------------|
| | # | Avg. Course Grade Point | # | Avg. Course Grade Point |
| MATH118 | 7036 | 3.22 | 21 | 3.65 |
| MATH117 | 5767 | 3.22 | 31 | 3.76 |
| JTC 300 | 1499 | 3.31 | 5464 | 3.30 |
| BC 351 | 624 | 2.50 | 2432 | 2.70 |
| MKT 305 | 583 | 2.33 | 2656 | 3.17 |
| BMS 300 | 521 | 1.99 | 3686 | 2.35 |
| MGT 305 | 492 | 2.84 | 2980 | 2.96 |
| BUS 150 | 403 | 3.32 | 3514 | 3.58 |
| ACT 205 | 380 | 2.18 | 3626 | 2.64 |
| FIN 305 | 361 | 2.34 | 1957 | 2.81 |
| BUS 205 | 301 | 2.34 | 3056 | 2.80 |
| ECON306 | 300 | 2.34 | 891 | 2.80 |
| ECON204 | 289 | 2.46 | 3991 | 2.65 |
| ECON202 | 282 | 2.40 | 5666 | 2.61 |
| CO 150 | 273 | 2.47 | 11978 | 2.97 |
| MU 100 | 267 | 2.90 | 8923 | 3.43 |
| PSY 252 | 263 | 3.04 | 1183 | 2.87 |
| ANTH120 | 262 | 2.87 | 1338 | 2.71 |
| SOC 100 | 261 | 3.05 | 3619 | 2.81 |
| ECON304 | 252 | 2.25 | 750 | 2.80 |
| PHIL103 | 242 | 2.71 | 2560 | 3.01 |
| SPCM100 | 237 | 2.68 | 3987 | 2.98 |
| HDFS302 | 225 | 2.83 | 908 | 3.29 |
| ECON335 | 221 | 2.10 | 578 | 2.99 |
| HDFS312 | 220 | 2.82 | 821 | 2.98 |
| PSY 228 | 219 | 2.81 | 876 | 3.12 |
| PSY 100 | 218 | 2.81 | 7398 | 3.03 |
| MU 333 | 217 | 3.27 | 441 | 2.76 |
| BZ 479 | 216 | 3.35 | 15 | 3.02 |
| SPCM341 | 216 | 2.48 | 562 | 2.85 |
| HDFS101 | 212 | 2.75 | 2472 | 3.20 |
| GR 100 | 209 | 3.06 | 1365 | 2.94 |
| HDFS334 | 204 | 2.77 | 860 | 3.09 |
| ECON211 | 203 | 2.83 | 872 | 3.00 |
| SPCM349 | 196 | 2.83 | 159 | 2.81 |
| HDFS277 | 196 | 3.15 | 960 | 3.65 |
| ANTH140 | 192 | 2.91 | 1313 | 2.78 |
| HES 444 | 186 | 3.21 | 6 | 3.83 |
| CO 300 | 184 | 3.22 | 4793 | 3.03 |
| HDFS311 | 183 | 3.01 | 1086 | 3.12 |
| SPCM350 | 182 | 2.75 | 377 | 3.12 |
| JTC 355 | 180 | 3.11 | 215 | 3.57 |

Note: Only courses with at least 180 online students are included in the table; however, all courses that offered online and in person courses regardless of course size was used in the analysis.