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#### Abstract

The following analysis of student perceptions of new (first year) and existing faculty controlling for college and year. From 2012 to 2018, the university administered end-ofcourse surveys to students in both face-to-face and online sections. The surveys included three questions related to students' perceptions of instructor performance at a regional Texas public upper-level institution. Faculty teaching in their first-year score 0.1 points lower than faculty teaching in subsequent years at the university level when asking students about the excellence of a course.


## Introduction

An experienced faculty member new to the university inquired about the mean ratings on end-of-course surveys for faculty newly teaching at the university compared to scores for existing faculty. The assertion was that scores for new faculty members would improve as they assimilated university cultural norms and adopted practices similar to those used by other faculty at the university. The office of Institutional Research and Assessment compared end-ofcourse ratings for three questions on the IDEA Student Ratings of Instruction Survey related to an instructor's efforts in the classroom. The results indicate ratings received by new faculty in their first year at the university have no practically or statistically significant difference, on average, from scores of existing faculty who have been teaching at the university for more than a year.

## Methodology

We applied the T-Test and Paired T-Test to the mean ratings for new and existing faculty on end-of-course surveys to identify the difference of the section means. The data included 47,587 student responses collected between 2012 and 2018. Faculty conducted the surveys digitally for online and on paper for face-to-face sections. All students in all sections for all semesters, including summer terms, received an invitation to participate. The university's consistent use of the same set of end-of-course survey questions from 2012 to 2018 made the instructor-related questions excellent data for our study. Additionally, professional design and national benchmark ensured higher levels of validity and reliability with the data.

We analyzed the instructor-related questions included in the survey: (Q16) "As a result of taking this course, I have more positive feelings toward this field of study"; (Q17) "Overall, I rate this instructor an excellent teacher"; and (Q18) "Overall, I rate this course as excellent." Students responded to these questions on a Likert scale from 1, indicating least agreement, and 5, indicating most agreement.

We calculated the mean response for each course section by summing the score values and dividing by the count of responses. We identified sections taught by new and existing faculty by calculating the years of teaching experience the faculty member had teaching at the university at the time they taught the section. We compared the differences in mean responses for sections taught by new and existing faculty by performing a T-Test (focus 1 ) and compared the difference in mean responses for sections taught by the same faculty member as a new and existing instructor by performing a paired T-Test (focus 2 ).

Focus 1: Sections taught by new and existing faculty by the college.
Null hypothesis: There is no significant statistical difference between the mean ratings of the sections taught by new and existing faculty at the college level.

Alternate Hypothesis: There is a significant statistical difference between mean ratings of the sections taught by new and existing faculty at the college level.

Focus 2: Sections taught by the same faculty member as a new and existing instructor.
Null hypothesis: There is no significant statistical difference between mean ratings of the sections taught by the same faculty member as a new and existing instructor.

Alternate Hypothesis: There is a significant statistical difference between the mean ratings of the sections taught by the same faculty member as a new and existing instructor.

The T-Test is a standard methodology used in evaluating a single independent variable with two groups (new and existing) and a single normal dependent variable (mean section rating). While the student response to an interval Likert scale on the survey, converting the scores into a mean for the section converted the interval variable into a normal variable. Additionally, the paired TTest is commonly applied when analyzing dependent matched groups (a faculty member as new and existing) and a normal independent variable.

## Results

Tables 1, 2, and 3 show the descriptive statistics by faculty status. Instructors were rated higher compared to course ratings and more positive feelings towards this field of study. The tables show descriptive statistics by college and faculty status for each question. The trend for the college of education varies from the other colleges as the ratings are higher for faculty and equal rating for both course rating (Q16) and gaining positive feeling towards this course (Q18).

The mean ratings are 0.1 lower for new than existing faculty for all colleges and the university overall, except for the college of business administration where the means are the same. The difference is statistically significant for question 18 for the university and the college of arts and sciences, but not for the other groups in the study.

The study includes 47,587 survey responses with new faculty having taught 610 or $10.1 \%$ out of the 6032 sections surveyed between 2012 and 2018. The descriptive statics in Tables 1, 2, and 3 indicate the mean rating for question 17, "Overall, I rate this instructor an excellent teacher," is 4.4, which is slightly higher than questions 18 (4.3) and 16 (4.2). The table includes descriptive statistics for all three questions for all years and both faculty types. These are additionally broken out by college to indicate the means do not vary more than 0.2 for any category.

As we can see in table 4, the courses taught by existing faculty received slightly higher ratings than the courses taught by new faculty, for all the three survey questions at the university level. The difference is not large enough to be practically significant for question 16 ( $\mathrm{t}=1.81, \mathrm{p}=0.07$ ), question $17(t=1.25, p=0.21)$, and question $18(t=2.51, p=0.012)$. However, the difference in question 18 is statistically significant.

The annual college means vary from the overall mean to the same degree (Figures 1, 2, and 3 and Tables 6,7 , and 8 ). The data indicate the mean ratings for all three questions are consistently higher than 4.0 for all academic years. For CAS, existing faculty received slightly higher ratings than new faculty for all three survey questions. The difference is not practically significant for questions 16 ( $t=1.87, p=0.07$ ), $17(t=1.88, p=0.06), 18(t=2.07, p=0.04)$. However, it is statistically significant for question 18. For COBA, existing faculty received the same mean ratings as new faculty for questions $16(t=-0.46, p=0.65), 17(t=-1.15, p=0.25)$, and $18(t=0.64$,
$p=0.53$ ). For COED, existing faculty received slightly higher mean ratings than new faculty for questions 16,17 , and 18 . The difference is not large enough to be practically significant for questions 16 ( $t=1.29, \mathrm{p}=0.2$ ), $17(\mathrm{t}=1.36, \mathrm{p}=0.18$ ), and 18 ( $\mathrm{t}=1.44, \mathrm{p}=0.15$ ). See Tables 6, 7, and 8 for university- and college-level T-Test results by year.

In addition to the T-Test to compare the mean ratings of sections taught by new and existing faculty, we compared the mean ratings of sections taught by a given faculty member. We grouped the ratings for the sections when the faculty member was new, teaching in the first year, and the faculty member was included in the existing category or had been at the university for more than a year. We determined the statistical significance using the paired T-Test. Table 5 demonstrates the means range from 4.1 to 4.4, and the means of the differences range be 0 , no change in mean from new to existing, to -0.2 , a decrease in mean from new to existing. The paired comparison of mean ratings for courses taught by the same faculty as a new and an existing faculty member is not practically or statistically significant in any case. See Tables 9, 10, and 11 for Paired T-Test results for college means for each question.

Figure 1. Mean Rating by College for Question 16


Figure 2. Mean Rating by College for Question 17


Figure 3. Mean Rating by College for Question 18


## Conclusion

We conclude that faculty teaching in their first-year score 0.1 points lower than faculty teaching in subsequent years at the university level when asking students about the excellence of a course, and the difference is not likely due to random chance. However, we do not see a defined difference between the mean ratings of the sections taught by new and existing faculty for the other questions studied. The data support the mean student ratings for the instructorrelated questions in the survey are consistently above 4.0 for all years and colleges. The study indicates a faculty member's time at the university does not change a student's mean rating when asked about the course's impact on the student's positive feelings on the field of study or the student's perception of the level of excellence in teaching.

## References

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## Appendix A

Table 1. Descriptive Statistics for Question 16
University CAS

| Faculty | All | Existing | New | Existing | New | Existing | New | Existing | New |
| :--- | ---: | ---: | ---: | ---: | ---: | ---: | ---: | ---: | ---: |
| $\mathbf{N}$ | 6,033 | 5,423 | 610 | 1,708 | 217 | 2,212 | 263 | 1,503 | 130 |
| Mean | 4.2 | 4.2 | 4.1 | 4.2 | 4.1 | 4.1 | 4.1 | 4.3 | 4.2 |
| Median | 4.3 | 4.3 | 4.3 | 4.4 | 4.3 | 4.2 | 4.2 | 4.5 | 4.5 |
| Mode | 5 | 5 | 5 | 5.0 | 5.0 | 4.0 | 4.0 | 5.0 | 5.0 |
| Max | 5 | 5 | 5 | 5.0 | 5.0 | 5.0 | 5.0 | 5.0 | 5.0 |
| Min | 1 | 1 | 1 | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 |
| Std Dev | 0.7 | 0.7 | 0.7 | 0.7 | 0.7 | 0.7 | 0.7 | 0.6 | 0.8 |

Table 2. Descriptive Statistics for Question 17

|  | University |  |  | CAS |  |  |  | COBA |  |
| :--- | ---: | ---: | ---: | ---: | ---: | ---: | ---: | ---: | ---: |
| Faculty | All | Existing | New | Existing | New | Existing | New | Existing | New |
| $\mathbf{N}$ | 6,033 | 5,423 | 610 | 1,708 | 217 | 2,212 | 263 | 1,503 | 130 |
| Mean | 4.4 | 4.4 | 4.3 | 4.4 | 4.3 | 4.3 | 4.3 | 4.4 | 4.3 |
| Median | 4.6 | 4.6 | 4.5 | 4.7 | 4.6 | 4.5 | 4.5 | 4.6 | 4.7 |
| Mode | 5 | 5 | 5 | 5.0 | 5.0 | 5.0 | 5.0 | 5.0 | 5.0 |
| Max | 5 | 5 | 5 | 5.0 | 5.0 | 5.0 | 5.0 | 5.0 | 5.0 |
| Min | 1 | 1 | 1 | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 | 1.3 |
| Std Dev | 0.7 | 0.7 | 0.7 | 0.7 | 0.8 | 0.8 | 0.7 | 0.7 | 0.8 |

Table 3. Descriptive Statistics for Question 18

|  | University |  |  | CAS |  |  | COBA |  | COED |  |
| :--- | ---: | ---: | ---: | ---: | ---: | ---: | ---: | ---: | ---: | ---: |
|  | All | Existing | New | Existing | New | Existing | New | Existing | New |  |
| $\mathbf{N}$ | 6,033 | 5,423 | 610 | 1,708 | 217 | 2,212 | 263 | 1,503 | 130 |  |
| Mean | 4.3 | 4.3 | 4.2 | 4.3 | 4.2 | 4.2 | 4.2 | 4.3 | 4.2 |  |
| Median | 4.4 | 4.5 | 4.3 | 4.5 | 4.3 | 4.3 | 4.3 | 4.5 | 4.5 |  |
| Mode | 5 | 5 | 5 | 5.0 | 5.0 | 5.0 | 5.0 | 5.0 | 5.0 |  |
| Max | 5 | 5 | 5 | 5.0 | 5.0 | 5.0 | 5.0 | 5.0 | 5.0 |  |
| Min | 1 | 1 | 1 | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 | 1.5 |  |
| Std Dev | 0.7 | 0.7 | 0.7 | 0.7 | 0.8 | 0.7 | 0.7 | 0.7 | 0.8 |  |

Table 4. Comparing group means for courses taught by existing and new faculty, T-Test.

|  |  | University | CAS | COBA | COED |
| :---: | :---: | :---: | :---: | :---: | :---: |
| Course | Existing | 5423 | 1708 | 2212 | 1503 |
| Surveys | New | 610 | 217 | 263 | 130 |
| Q16 | Mean Existing | 4.2 | 4.2 | 4.1 | 4.3 |
|  | Mean New | 4.1 | 4.1 | 4.1 | 4.2 |
|  | Diff | 0.1 | 0.1 | 0.0 | 0.1 |
|  | T-value | 1.81 | 1.87 | (0.46) | 1.29 |
|  | P-value | 0.07 | 0.06 | 0.65 | 0.2 |
| Q17 | Mean Existing | 4.4 | 4.4 | 4.3 | 4.4 |
|  | Mean New | 4.3 | 4.3 | 4.3 | 4.3 |
|  | Diff | 0.0 | 0.1 | 0.1 | 0.1 |
|  | T-value | 1.25 | 1.88 | (1.15) | 1.36 |
|  | P-value | 0.21 | 0.06 | 0.25 | 0.18 |
| Q18 | Mean Existing | 4.3 | 4.3 | 4.2 | 4.3 |
|  | Mean New | 4.2 | 4.2 | 4.2 | 4.2 |
|  | Diff | 0.1 | 0.1 | 0.0 | 0.1 |
|  | T-value | 2.51 | 2.07 | 0.64 | 1.44 |
|  | P -value | 0.01* | 0.04* | 0.53 | 0.15 |

Table 5. Comparison of mean difference for the paired groups, Paired T-Test.

|  |  | University | CAS | COBA | COED |
| :--- | :--- | ---: | ---: | ---: | ---: |
|  | Courses | 156 | 65 | 56 | 34 |
| Q16 | Mean | 4.2 | 4.2 | 4.1 | 4.3 |
|  | Mean(Diff) | $(0.0)$ | $(0.1)$ | $(0.2)$ | $(0.0)$ |
|  | P-value | 0.4 | 0.4 | 0.8 | 0.7 |
| Q17 | Mean | 4.4 | 4.4 | 4.3 | 4.4 |
|  | Mean(Diff) | 0.0 | 0.0 | 0.0 | $(0.0)$ |
|  | P-value | 0.8 | 0.9 | 0.7 | 0.8 |
| Q18 | Mean | 4.3 | 4.3 | 4.2 | 4.3 |
|  | Mean(Diff) | $(0.0)$ | 0.0 | $(0.0)$ | $(0.0)$ |
|  | P-value | 0.9 | 0.5 | 0.6 | 0.8 |

Table 6. Comparison of means by the college for Q16, T-Test.

|  | University |  | CAS |  | COBA |  | COED |  |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
| All Years | Existing | New | Existing | New | Existing | New | Existing | New |
| Count | 5,423 | 610 | 1,708 | 217 | 2,212 | 263 | 1,503 | 130 |
| Max | 5 | 5 | 5 | 5 | 5 | 5 | 5 | 5 |
| Min | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 |
| Mean | 4.2 | 4.1 | 4.2 | 4.1 | 4.1 | 4.1 | 4.3 | 4.2 |
| Difference | 0.1 |  | 0.1 |  | 0 |  | 0.1 |  |
| P-Values | 0.07 |  | 0.06 |  | 0.65 |  | 0.2 |  |
| Stdev | 0.7 | 0.7 | 0.7 | 0.7 | 0.7 | 0.7 | 0.6 | 0.8 |
| 2012 | Existing | New | Existing | New | Existing | New | Existing | New |
| Count | 530 | 60 | 166 | 26 | 204 | 16 | 160 | 18 |
| Max | 5 | 5 | 5 | 5 | 5 | 5 | 5 | 5 |
| Min | 1 | 1 | 1 | 2.7 | 1 | 2.6 | 1 | 1 |
| Mean | 4.1 | 4.1 | 4.2 | 4.1 | 4 | 4 | 4.2 | 4.1 |
| Difference | 0.05 |  | 0.2 |  | 0 |  | 0.1 |  |
| P-Values | 0.65 |  | 0.27 |  | 0.79 |  | 0.75 |  |
| Stdev | 0.75 | 0.73 | 0.7 | 0.6 | 0.8 | 0.6 | 0.7 | 1 |
| 2013 | Existing | New | Existing | New | Existing | New | Existing | New |
| Count | 804 | 88 | 241 | 15 | 309 | 54 | 254 | 19 |
| Max | 5 | 5 | 5 | 5 | 5 | 5 | 5 | 5 |
| Min | 1 | 1.33 | 1 | 2.3 | 1 | 2.3 | 1.5 | 1.3 |
| Mean | 4.2 | 4 | 4.2 | 3.9 | 4 | 4 | 4.3 | 4.1 |
| Difference | 0.15 |  | 0.2 |  | 0 |  | 0.2 |  |
| P-Values | 0.09 |  | 0.3 |  | 0.83 |  | 0.35 |  |
| Stdev | 0.73 | 0.76 | 0.8 | 0.8 | 0.7 | 0.7 | 0.7 | 0.9 |
| 2014 | Existing | New | Existing | New | Existing | New | Existing | New |
| Count | 730 | 59 | 216 | 22 | 329 | 19 | 185 | 18 |
| Max | 5 | 5 | 5 | 5 | 5 | 5 | 5 | 5 |
| Min | 1 | 1.75 | 1 | 1.8 | 1 | 3 | 1.3 | 2.3 |
| Mean | 4.1 | 4.1 | 4.1 | 3.9 | 3.9 | 4.3 | 4.3 | 4.3 |
| Difference | -0.08 |  | 0.2 |  | -0.4 |  | 0 |  |
| P-Values | 0.5 |  | 0.3 |  | 0.03 |  | 0.93 |  |
| Stdev | 0.82 | 0.81 | 0.9 | 1 | 0.8 | 0.7 | 0.7 | 0.7 |


| 2015 | Existing | New | Existing | New | Existing | New | Existing | New |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
| Count | 823 | 140 | 247 | 46 | 335 | 77 | 241 | 17 |
| Max | 5 | 5 | 5 | 5 | 5 | 5 | 5 | 5 |
| Min | 1 | 1 | 1 | 1 | 1 | 1.5 | 1 | 2.5 |
| Mean | 4.2 | 4.2 | 4.2 | 4.2 | 4.1 | 4.1 | 4.3 | 4.5 |
| Difference | 0.01 |  | 0 |  | 0 |  | -0.2 |  |
| P-Values | 0.9 |  | 0.99 |  | 0.81 |  | 0.36 |  |
| Stdev | 0.7 | 0.69 | 0.7 | 0.7 | 0.7 | 0.6 | 0.6 | 0.7 |
| 2016 | Existing | New | Existing | New | Existing | New | Existing | New |
| Count | 854 | 104 | 262 | 55 | 342 | 32 | 250 | 17 |
| Max | 5 | 5 | 5 | 5 | 5 | 5 | 5 | 5 |
| Min | 1 | 1.71 | 2 | 1.7 | 1 | 3.4 | 2.8 | 3 |
| Mean | 4.3 | 4.1 | 4.3 | 4.1 | 4.1 | 4.2 | 4.4 | 4.1 |
| Difference | 0.14 |  | 0.2 |  | -0.1 |  | 0.3 |  |
| P-Values | 0.03 |  | 0.04 |  | 0.28 |  | 0.08 |  |
| Stdev | 0.63 | 0.65 | 0.6 | 0.7 | 0.6 | 0.5 | 0.6 | 0.7 |
| 2017 | Existing | New | Existing | New | Existing | New | Existing | New |
| Count | 889 | 79 | 294 | 32 | 369 | 29 | 233 | 18 |
| Max | 5 | 5 | 5 | 5 | 5 | 5 | 5 | 5 |
| Min | 1.54 | 1 | 2 | 2.7 | 2.2 | 1 | 1.5 | 3 |
| Mean | 4.3 | 4.2 | 4.3 | 4.4 | 4.2 | 4 | 4.3 | 4.3 |
| Difference | 0.07 |  | -0.1 |  | 0.2 |  | 0.1 |  |
| P-Values | 0.45 |  | 0.87 |  | 0.19 |  | 0.64 |  |
| Stdev | 0.56 | 0.77 | 0.6 | 0.7 | 0.5 | 0.9 | 0.6 | 0.5 |
| 2018 | Existing | New | Existing | New | Existing | New | Existing | New |
| Count | 793 | 80 | 282 | 21 | 331 | 36 | 180 | 23 |
| Max | 5 | 5 | 5 | 5 | 5 | 5 | 5 | 5 |
| Min | 1.58 | 2 | 1.6 | 2.7 | 2.1 | 2.8 | 2.3 | 2 |
| Mean | 4.3 | 4.2 | 4.3 | 4.2 | 4.2 | 4.2 | 4.4 | 4.3 |
| Difference | 0.1 |  | 0 |  | 0 |  | 0.1 |  |
| P-Values | 0.69 |  | 0.83 |  | 0.9 |  | 0.54 |  |
| Stdev | 0.6 | 0.57 | 0.6 | 0.6 | 0.6 | 0.5 | 0.6 | 0.7 |

Table 7. Comparison of means for Q17, T-Test.

|  | University |  | CAS |  | COBA |  | COED |  |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
| All Years | Existing | New | Existing | New | Existing | New | Existing | New |
| Count | 5,423 | 610 | 1,708 | 217 | 2,212 | 263 | 1,503 | 130 |
| Max | 5 | 5 | 5 | 5 | 5 | 5 | 5 | 5 |
| Min | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1.3 |
| Mean | 4.4 | 4.3 | 4.4 | 4.3 | 4.3 | 4.3 | 4.4 | 4.3 |
| Difference | 0 |  | 0.1 |  | -0.1 |  | 0.1 |  |
| P-Values | 0.21 |  | 0.06 |  | 0.25 |  | 0.18 |  |
| Stdev | 0.7 | 0.7 | 0.7 | 0.8 | 0.8 | 0.7 | 0.7 | 0.8 |
| 2012 | Existing | New | Existing | New | Existing | New | Existing | New |
| Count | 530 | 60 | 166 | 26 | 204 | 16 | 160 | 18 |
| Max | 5 | 5 | 5 | 5 | 5 | 5 | 5 | 5 |
| Min | 1 | 1 | 1 | 1 | 1 | 2.6 | 1 | 2 |
| Mean | 4.3 | 4.3 | 4.4 | 4.2 | 4.2 | 4.3 | 4.4 | 4.3 |
| Difference | 0.07 |  | 0.2 |  | -0.1 |  | 0.1 |  |
| P-Values | 0.54 |  | 0.24 |  | 0.48 |  | 0.62 |  |
| Stdev | 0.82 | 0.83 | 0.8 | 0.9 | 0.9 | 0.7 | 0.8 | 0.9 |


| 2013 | Existing | New | Existing | New | Existing | New | Existing | New |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
| Count | 804 | 88 | 241 | 15 | 309 | 54 | 254 | 19 |
| Max | 5 | 5 | 5 | 5 | 5 | 5 | 5 | 5 |
| Min | 1 | 1.33 | 1 | 2.3 | 1 | 2 | 1.4 | 1.3 |
| Mean | 4.3 | 4.2 | 4.4 | 4.2 | 4.2 | 4.1 | 4.4 | 4.3 |
| Difference | 0.13 |  | 0.1 |  | 0 |  | 0.1 |  |
| P-Values | 0.18 |  | 0.54 |  | 0.7 |  | 0.58 |  |
| Stdev | 0.79 | 0.83 | 0.8 | 0.8 | 0.8 | 0.8 | 0.7 | 1 |
| 2014 | Existing | New | Existing | New | Existing | New | Existing | New |
| Count | 730 | 59 | 216 | 22 | 329 | 19 | 185 | 18 |
| Max | 5 | 5 | 5 | 5 | 5 | 5 | 5 | 5 |
| Min | 1 | 1.25 | 1 | 1.3 | 1 | 3.7 | 1 | 2.3 |
| Mean | 4.3 | 4.3 | 4.3 | 4.1 | 4.1 | 4.6 | 4.4 | 4.4 |
| Difference | -0.07 |  | 0.2 |  | -0.4 |  | 0.1 |  |
| P-Values | 0.53 |  | 0.4 |  | 0 |  | 0.68 |  |
| Stdev | 0.88 | 0.78 | 0.9 | 1 | 0.9 | 0.4 | 0.7 | 0.7 |
| 2015 | Existing | New | Existing | New | Existing | New | Existing | New |
| Count | 823 | 140 | 247 | 46 | 335 | 77 | 241 | 17 |
| Max | 5 | 5 | 5 | 5 | 5 | 5 | 5 | 5 |
| Min | 1 | 1.92 | 1 | 1.9 | 1 | 2.5 | 1 | 2 |
| Mean | 4.3 | 4.5 | 4.4 | 4.5 | 4.2 | 4.5 | 4.4 | 4.6 |
| Difference | -0.15 |  | -0.1 |  | -0.2 |  | -0.2 |  |
| P-Values | 0.007 |  | 0.57 |  | 0 |  | 0.32 |  |
| Stdev | 0.79 | 0.57 | 0.8 | 0.6 | 0.9 | 0.5 | 0.7 | 0.8 |
| 2016 | Existing | New | Existing | New | Existing | New | Existing | New |
| Count | 854 | 104 | 262 | 55 | 342 | 32 | 250 | 17 |
| Max | 5 | 5 | 5 | 5 | 5 | 5 | 5 | 5 |
| Min | 1 | 2.17 | 1 | 2.3 | 1 | 3.2 | 1.9 | 2.2 |
| Mean | 4.4 | 4.2 | 4.5 | 4.2 | 4.3 | 4.3 | 4.5 | 3.9 |
| Difference | 0.21 |  | 0.2 |  | 0 |  | 0.6 |  |
| P-Values | 0 |  | 0.03 |  | 0.98 |  | 0.03 |  |
| Stdev | 0.65 | 0.73 | 0.6 | 0.7 | 0.7 | 0.5 | 0.6 | 1 |
| 2017 | Existing | New | Existing | New | Existing | New | Existing | New |
| Count | 889 | 79 | 294 | 32 | 369 | 29 | 233 | 18 |
| Max | 5 | 5 | 5 | 5 | 5 | 5 | 5 | 5 |
| Min | 1.33 | 1 | 2 | 2.9 | 1.3 | 1 | 1.4 | 3 |
| Mean | 4.4 | 4.4 | 4.5 | 4.5 | 4.4 | 4.1 | 4.4 | 4.5 |
| Difference | 0 |  | 0 |  | 0.2 |  | -0.2 |  |
| P-Values | 0.76 |  | 0.73 |  | 0.23 |  | 0.28 |  |
| Stdev | 0.6 | 0.78 | 0.5 | 0.6 | 0.5 | 1 | 0.7 | 0.5 |
| 2018 | Existing | New | Existing | New | Existing | New | Existing | New |
| Count | 793 | 80 | 282 | 21 | 331 | 36 | 180 | 23 |
| Max | 5 | 5 | 5 | 5 | 5 | 5 | 5 | 5 |
| Min | 1 | 1 | 1 | 1 | 1.7 | 3 | 2.5 | 2 |
| Mean | 4.4 | 4.3 | 4.5 | 4.3 | 4.4 | 4.3 | 4.5 | 4.3 |
| Difference | 0.1 |  | 0.1 |  | 0.1 |  | 0.2 |  |
| P-Values | 0.15 |  | 0.55 |  | 0.39 |  | 0.38 |  |
| Stdev | 0.61 | 0.76 | 0.6 | 0.9 | 0.6 | 0.6 | 0.6 | 0.6 |

Table 8. Comparison of means for Q18, T-Test.

|  | University |  | CAS |  | COBA |  | COED |  |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
| All Years | Existing | New | Existing | New | Existing | New | Existing | New |
| Count | 5,423 | 610 | 1,708 | 217 | 2,212 | 263 | 1,503 | 130 |
| Max | 5 | 5 | 5 | 5 | 5 | 5 | 5 | 5 |
| Min | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 |
| Mean Difference | 4.3 | 4.2 | 4.3 | 4.2 | 4.2 | 4.2 | 4.3 | 4.2 |
|  | 0.1 |  | 0.1 |  | 0 |  | 0.1 |  |
| P-Values | 0.01 |  | 0.04 |  | 0.53 |  | 0.15 |  |
| Stdev | 0.7 | 0.7 | 0.7 | 0.8 | 0.7 | 0.7 | 0.7 | 0.8 |
| 2012 | Existing | New | Existing | New | Existing | New | Existing | New |
| Count <br> Max <br> Min <br> Mean <br> Difference <br> P-Values <br> Stdev | 530 | 60 | 166 | 26 | 204 | 16 | 160 | 18 |
|  | 5 | 5 | 5 | 5 | 5 | 5 | 5 | 5 |
|  | 1 | 1.33 | 1 | 1.3 | 1 | 2.8 | 1 | 2 |
|  | 4.2 | 4.1 | 4.3 | 4.1 | 4.1 | 4.1 | 4.2 | 4.1 |
|  | 0.08 |  | 0.2 |  | 0 |  | 0.1 |  |
|  | 0.4 |  | 0.25 |  | 0.83 |  | 0.54 |  |
|  | 0.76 | 0.79 | 0.7 | 0.8 | 0.8 | 0.7 | 0.8 | 0.9 |
| 2013 | Existing | New | Existing | New | Existing | New | Existing | New |
| Count <br> Max <br> Min <br> Mean <br> Difference <br> P-Values <br> Stdev | 804 | 88 | 241 | 15 | 309 | 54 | 254 | 19 |
|  | 5 | 5 | 5 | 5 | 5 | 5 | 5 | 5 |
|  | 1 | 1.67 | 1 | 2.3 | 1 | 2.3 | 1.5 | 1.7 |
|  | 4.2 | 4 | 4.3 | 4 | 4.1 | 4 | 4.3 | 4.1 |
|  | 0.18 |  | 0.3 |  | 0.1 |  | 0.2 |  |
|  | 0.03 |  | 0.23 |  | 0.5 |  | 0.25 |  |
|  | 0.73 | 0.78 | 0.7 | 0.8 | 0.7 | 0.7 | 0.7 | 0.9 |
| 2014 | Existing | New | Existing | New | Existing | New | Existing | New |
| Count <br> Max <br> Min <br> Mean <br> Difference <br> P-Values <br> Stdev | 730 | 59 | 216 | 22 | 329 | 19 | 185 | 18 |
|  | 5 | 5 | 5 | 5 | 5 | 5 | 5 | 5 |
|  | 1 | 1.5 | 1 | 1 | 1 | 3.2 | 1.5 | 3 |
|  | 4.2 | 4.3 | 4.2 | 4.2 | 4.1 | 4.4 | 4.4 | 4.4 |
|  | -0.1 |  | 0 |  | -0.3 |  | 0 |  |
|  | 0.25 |  | 0.9 |  | 0.04 |  | 0.97 |  |
|  | 0.81 | 0.68 | 0.9 | 0.8 | 0.8 | 0.5 | 0.7 | 0.6 |
| 2015 | Existing | New | 0.9 | 0.8 | Existing | New | Existing | New |
| Count <br> Max <br> Min <br> Mean <br> Difference <br> P-Values <br> Stdev | 823 | 140 | 247 | 46 | 335 | 77 | 241 | 17 |
|  | 5 | 5 | 5 | 5 | 5 | 5 | 5 | 5 |
|  | 1 | 1 | 1 | 1 | 1 | 2.5 | 1 | 1.8 |
|  | 4.3 | 4.3 | 4.3 | 4.3 | 4.2 | 4.3 | 4.3 | 4.5 |
|  | -0.06 |  | 0 |  | -0.1 |  | -0.2 |  |
|  | 0.29 |  | 0.94 |  | 0.17 |  | 0.36 |  |
|  | 0.74 | 0.66 | 0.7 | 0.7 | 0.8 | 0.5 | 0.7 | 0.9 |
| 2016 | Existing | New | Existing | New | Existing | New | Existing | New |
| Count <br> Max <br> Min <br> Mean <br> Difference <br> P-Values <br> Stdev | 854 | 104 | 262 | 55 | 342 | 32 | 250 | 17 |
|  | 5 | 5 | 5 | 5 | 5 | 5 | 5 | 5 |
|  | 1 | 2.2 | 1 | 2.2 | 1 | 3.3 | 2.1 | 2.4 |
|  | 4.3 | 4.1 | 4.4 | 4.1 | 4.2 | 4.2 | 4.4 | 4 |
|  | 0.19 |  | 0.3 |  | 0 |  | 0.4 |  |
|  | 0 |  | 0.02 |  | 0.84 |  | 0.1 |  |
|  | 0.65 | 0.69 | 0.6 | 0.7 | 0.7 | 0.5 | 0.6 | 0.9 |


| 2017 | Existing | New | Existing | New | Existing | New | Existing | New |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
| Count | 889 | 79 | 294 | 32 | 369 | 29 | 233 | 18 |
| Max | 5 | 5 | 5 | 5 | 5 | 5 | 5 | 5 |
| Min | 1.31 | 1 | 1.8 | 2.6 | 1 | 1 | 1.3 | 3 |
| Mean | 4.3 | 4.3 | 4.4 | 4.4 | 4.3 | 4 | 4.3 | 4.4 |
| Difference | 0.1 |  | 0 |  | 0.3 |  | -0.1 |  |
| P-Values | 0.38 |  | 0.77 |  | 0.12 |  | 0.72 |  |
| Stdev | 0.59 | 0.78 | 0.6 | 0.6 | 0.5 | 1 | 0.7 | 0.6 |
| 2018 | Existing | New | Existing | New | Existing | New | Existing | New |
| Count | 793 | 80 | 282 | 21 | 331 | 36 | 180 | 23 |
| Max | 5 | 5 | 5 | 5 | 5 | 4.9 | 5 | 5 |
| Min | 1 | 1.33 | 1 | 1.3 | 1.6 | 2.3 | 2.4 | 1.5 |
| Mean | 4.3 | 4.2 | 4.4 | 4.2 | 4.3 | 4.1 | 4.4 | 4.2 |
| Difference | $0.1$ |  | 0.2 |  | 0.2 |  | 0.2 |  |
| P-Values | 0.04 |  | 0.44 |  | 0.08 |  | 0.3 |  |
| Stdev | 0.62 | 0.75 | 0.7 | 0.9 | 0.6 | 0.6 | 0.6 | 0.9 |

Table 9. Comparison of the difference of mean ratings for a faculty member for Q16, Paired TTest.

|  | University | CAS | COBA | COED |
| :---: | :---: | :---: | :---: | :---: |
| Count | 156 | 65 | 56 | 34 |
| Max (Diff) | 2.3 | 1.3 | 2.3 | 1.7 |
| Min (Diff) | -2.1 | -2 | -2.1 | -1.5 |
| Mean | 4.2 | 4.2 | 4.1 | 4.3 |
| Mean( Diff) | 0 | -0.1 | -0.2 | 0 |
| P-Values | 0.4 | 0.4 | 0.8 | 0.7 |
| Stdev | 0.6 | 0.5 | 0.6 | 0.6 |

Table 10. Comparison of the difference of mean ratings for a faculty member for Q17, Paired TTest.

|  | University | CAS | COBA | COED |
| :--- | ---: | ---: | ---: | ---: |
| Count | 156 | 65 | 56 | 34 |
| Max (Diff) | 2.6 | 1.4 | 2.6 | 2.2 |
| Min (Diff) | -2.1 | -2.1 | -1.7 | -1.7 |
| Mean | 4.4 | 4.4 | 4.3 | 4.4 |
| Mean( Diff) | 0 | 0 | 0 | 0 |
| P-Values | 0.8 | 0.9 | 0.7 | 0.8 |
| Stdev | 0.6 | 0.5 | 0.6 | 0.6 |
|  |  |  |  |  |

Table 11. Comparison of the difference of mean ratings for a faculty member for Q18, Paired TTest.

|  | University |  | CAS | COBA |
| :--- | ---: | ---: | ---: | ---: |
| Count | 156 | 65 | 56 | COED |
| Max (Diff) | 2.9 | 1.5 | 2.9 | 34 |
| Min (Diff) | -2 | -2 | -2 | 2 |
| Mean | 4.3 | 4.3 | 4.2 | -2 |
| Mean( Diff) | 0 | 0 | 0 | 4.3 |
| P-Values | 0.5 | 0.6 | 0 |  |
|  |  | 0.9 | 0.5 | 0.7 |
|  |  | 0.6 | 0.5 | 0.7 |

