ACUE Association of College and University Educators

# Evaluation of the Student Impact of ACUE's Course in Effective Teaching Practices at Delta State University

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## Executive Summary

While years of research on teaching and learning have led to the identification of evidence-based teaching practices that improve student outcomes, college faculty are rarely trained in these pedagogical practices, and little research is available to fully assess the impact that faculty development programs designed to teach these practices have on student outcomes. The Association of College and University Educators (ACUE) developed and offers online faculty development courses in effective teaching practices based on a thorough review of the research on teaching and learning, as well as conversations with experts in the scholarship of teaching and learning. The foundational Course in Effective Teaching Practices was offered to a group of faculty at Delta State University during the 2017-2018 academic year.

This evaluation focuses on the impact of the ACUE foundational Course in Effective Teaching Practices on students at Delta State University during the 2017-2018 academic year, in terms of course completion, grades, course evaluations, self-efficacy, growth mindset, perceptions of classroom practices, and overall impressions of the course and instructor. We evaluated course completion, grades, and course evaluations through comparing outcomes in course sections taught by ACUE-credentialed faculty to course sections taught by matched faculty who did not yet participate in the ACUE course. We assessed the impact on self-efficacy, growth mindset, and student perceptions of courses and instructors through a student questionnaire that was administered at the end of the fall 2017 and spring 2018 semesters to students of faculty participating in the ACUE course.

Our evaluation showed that course sections taught by ACUE-credentialed faculty had higher rates of success—defined as As, Bs, and Cs in graded courses and credit in nongraded courses—compared to course sections taught by matched faculty. Similarly, the same course

sections taught by ACUE-credentialed faculty had lower DFW rates (students who received Ds, Fs, and NCs, and students who withdrew from courses) compared to course sections taught by matched faculty. In addition, students of ACUE-credentialed faculty in the spring 2018 semester reported higher growth mindset compared to students of the same faculty in the fall 2017 semester.

This evaluation was completed while faculty were engaged in and finishing their ACUE coursework. Further research will be done to evaluate the continued impact on students in the years after faculty earn their credential, as well as the impact on students and institutional-level outcomes as the course is scaled to reach more faculty and more students.

**Evaluation of the Student Impact of ACUE's Course in Effective Teaching Practices at Delta State University**

The Commission on the Future of Undergraduate Education (2017), in its recent report *The Future of Undergraduate Education: The Future of America*, argued that "institutions need to devote far more attention to and support for the quality of teaching and the teaching workforce" as a key driver toward achieving the goal that "students in every program and institution receive the education they need to succeed in the twenty-first century" (p. 5). In addition, decades of research from the scholarship of teaching and learning have identified specific evidence-based teaching practices that improve student outcomes (Armbruster, Patel, Johnson, & Weiss, 2009; Burrowes, 2003; Freeman, Haak, & Wenderoth, 2011; Hattie, 2009; Kember & Gow, 1994; Marton, Hounsell, & Entwistle, 1997; Mazur, 2009; Prosser & Trigwell, 2006; Zimmerman, 2002). At the same time, faculty, while experts in their discipline and research methods, rarely receive formal and comprehensive training in those evidence-based practices shown to improve student motivation, engagement, persistence, and learning. In addition, despite the sizable research connecting specific instructional practices to improved student learning, there is less research that fully connects the dots between faculty development designed to improve instructional practices and the consequent impact on student-level outcomes (Devlin, 2008; Hénard & Roseveare, 2012; Hines, 2007), notwithstanding some emerging research (Condon, Iverson, Manduca, Rutz, & Willett, 2016; Seidman, 2012).

In an effort to catalog the evidence-based teaching practices that improve student achievement, ACUE reviewed over 300 citations from the scholarship of teaching and learning and engaged with teaching and learning experts across the country to develop the ACUE

Effective Practice Framework©. The Framework was independently validated by the American Council on Education (ACE; 2017) and serves as a consensus statement of the teaching skills and knowledge that every college educator should possess in order to teach effectively, regardless of discipline (ACUE, 2016). ACUE developed and offers courses in effective teaching practices that are fully aligned to the Framework's five major units of study: designing an effective course and class, establishing a productive learning environment, using active learning techniques, promoting higher order thinking, and assessing to inform instruction and promote learning. ACUE's foundations Course in Effective Teaching Practices recommends over 200 evidence-based teaching approaches. The foundations course is offered online and certified by Quality Matters (see ACUE, 2017). To satisfy course requirements, faculty engage with content, are required to implement evidence-based practices, and write rubric-aligned reflections on their implementation, including citing changes in student behaviors. Faculty who satisfy course requirements for at least 25 modules earn a Certificate in Effective College Instruction endorsed by ACE. During the 2017-2018 academic year, a cohort of 22 faculty at Delta State University participated in ACUE's Course in Effective Teaching Practices, with 17 faculty earning the ACUE credential.

ACUE developed a six-level accountability method to evaluate the impact of faculty development on teaching practices and student outcomes (MacCormack, Snow, Gyurko, & Candio Sekel, 2018). The six levels are (a) faculty engagement, (b) faculty learning, (c) faculty implementation, (d) student engagement, (e) course-level student outcomes, and (f) institutional outcomes. The current study focuses on evaluating the impact of the ACUE Course in Effective Teaching Practices at Delta State University on levels 4 and 5: student outcomes.

## Method

### Participants and Procedures

This evaluation focuses on the 17 faculty at Delta State University who completed the ACUE Course in Effective Teaching Practices during the 2017-2018 academic year. One faculty member finished the last five modules of the course during the summer following the 2018 spring semester. Delta State University identified a matched control faculty member for each faculty member in the ACUE course. Matching was based on courses taught during 2017-2018, rank, and years of experience at Delta State University. Faculty could not always be matched on all of these criteria; however, there were no significant differences between ACUE-credentialed and matched faculty in terms of tenure, $\chi^2$ (2, $N$ = 34) = 2.33, $p$ =.311; whether faculty were full-time or part-time, $\chi^2$ (1, $N$ = 34) = 1.03, $p$ = .310; and rank, $\chi^2$ (3, $N$ = 34) = 3.82, $p$ =.282 (see Table 1). Since Delta State University specifically targeted new faculty for the ACUE course, there was a significant difference between the ACUE-credentialed and matched faculty in years of experience at Delta State University, $F$ (1, 32) = 12.09, $p$ = .001, with the ACUE-credentialed faculty having an average of .65 years of experience ($SD$ = 1.27, range = 0–4) and the matched faculty having an average of 7.06 years of experience ($SD$ = 7.50, range = 1–23).

The evaluation analyzed grades and completion data for all students enrolled in the 144 course sections taught by ACUE-credentialed faculty and 170 course sections taught by the matched faculty during the 2017-2018 academic year, representing a total of 4,602 student enrollments. A two (ACUE participation) by two (term) factorial MANOVA, with observations weighted by total enrollments, indicated a significant difference between the fall and spring course sections in students' class year, $F$ (4, 07) = 3.17, $p$ = .014, with univariate tests showing that the spring course sections had significantly fewer freshmen, $F$ (1, 310) = 7.26, $p$ = .007, and

sophomores, $F$ (1, 310) = 5.03, $p$ = .036, and significantly more graduate students, $F$ (1, 310) = 5.32, $p$ = .022, compared to the fall course sections (see Table 2). Additionally, we analyzed 1,730 official course evaluations for the 264 course sections (130 taught by ACUE faculty and 134 taught by matched faculty) that had at least one course evaluation response.

In addition, faculty participating in the ACUE course distributed the ACUE student questionnaire to students in their courses at the end of the fall 2017 and spring 2018 semesters. We received 820 responses from students of the 11 ACUE-credentialed faculty who had responses for both the fall and spring semesters: 393 responses in the fall and 427 in the spring. There was a significant difference between semesters in respondents' self-reported class year, $\chi^2$ (5, $N$ = 809) = 40.22, $p$ < .001. As shown in Table 3, more of the spring respondents are freshmen. There was no difference between semesters in respondents' enrollment status, $\chi^2$ (1, $N$ = 807) = 0.57, $p$ = .452 (see Table 3).

**Measures**

**Course data.** Course data were analyzed for completion and student grades. Course noncompletion encompasses students who dropped or withdrew from a course or were cut from a course for exceeding the allowable number of absences. The success rate encompasses students receiving As, Bs, and Cs and students who received credit in nongraded courses. The DFW rate encompasses students who received Ds and Fs, those who did not receive credit in nongraded courses, and students who withdrew from courses.

**Course evaluations.** Eleven items from the course evaluations were averaged together to form one scale ($\alpha$ = .960), since a principal components factor analysis indicated that the items comprised a single factor, with all 11 items having high factor loadings. Several items related to textbooks and starting class on time were excluded because these items had large

amounts of missing data or not applicable responses. Students responded to all items on a 5-point *strongly agree* to *strongly disagree* Likert scale.

**Student questionnaire.** The classroom perceptions scale ($\alpha$ = .973) comprises the first part of the student questionnaire. The 17 items on this scale are directly tied to the content of the ACUE course and assess students' perceptions of the extent to which their instructors are engaging in these evidence-based classroom practices. Students respond to each item on a 5-point *strongly agree* to *strongly disagree* Likert scale. The second part of the student questionnaire includes a single item on growth mindset taken from a longer, widely used scale (Dweck, 2000) that generally shows very high reliability, with each item highly correlated with the overall scale score. The second part also includes an academic self-efficacy scale (adapted from The College System of Tennessee, n.d.), which is composed of two subscales: academic self-monitoring (e.g., keeping up-to-date with schoolwork) and academic communications (e.g., asking a question in class). The self-monitoring subscale includes 4 items ($\alpha$ = .835), and the communications subscale includes 3 items ($\alpha$ = .775). Students respond to these items on a 5-point Likert scale from *not at all confident* (1) to *extremely confident* (5). The third part of the student questionnaire includes demographic questions as well as two items on students' overall impression of the instructor and the course. One item asks students to indicate on a 5-point Likert scale how likely they are to recommend their instructor to a friend, and the other asks students how the course compares to other courses they have taken—whether it is better, worse, or about the same.

## Results

### Data Analysis Plan

All analyses of course data involved two (ACUE participation) by two (term) factorial ANOVAs, with observations weighted by the number of students enrolled in each course section, in order to examine student-level impact using course-level data.[1] Since response rates for course evaluations varied widely by section, course evaluation responses were aggregated to the course level and then analyzed in the same way as course data, but with the number of students completing the course rather than the number of students enrolled as the weighting variable.

Since students of the matched faculty did not receive the student questionnaire, analyses compared student responses at the end of the fall semester, when ACUE-credentialed faculty were about halfway through the course, to student responses at the end of the spring semester, about 1 to 2 weeks after ACUE-credentialed faculty were supposed to have completed the ACUE course requirements.

### Course Data

**Course completion.** There were no significant main effects of ACUE participation, $F$ (1, 310) = 0.40, $p$ = .526, or term, $F$ (1, 310) = 0.97, $p$ = .325, on course completion, nor was the interaction between ACUE participation and term significant, $F$ (1, 310) = 0.04, $p$ = .837. There was a significant effect of term on the proportion of students dropping courses, $F$ (1, 310) = 6.77, $p$ = .010, with higher dropout rates in the fall 2017 semester ($M$ = 1.50%, $SD$ = 14.60%)

[1] Analyses were also run with students' class year as a control variable, since there was a significant difference between terms in students' class year. The only meaningful difference in results was that when class year was included as a control variable, there was a significantly higher DFW rate in the spring 2018 semester than in the fall 2017 semester, $F$ (1, 309) = 4.02, $p$ = 046.

than in the spring 2018 semester (*M* = 0.59%, *SD* = 7.93%). The effect of ACUE participation on the proportion of students dropping courses was not significant, *F* (1, 310) = 0.03, *p* = .865, nor was the interaction between ACUE participation and term, *F* (1, 310) = 0.47, *p* = .494. There was a significant effect of term on the proportion of students who withdrew from courses, *F* (1, 310) = 4.53, *p* = .034, with higher withdrawal rates in the spring 2018 semester (*M* = 3.64%, *SD* = 26.22%) than in the fall 2017 semester (*M* = 2.33%, *SD* = 16.52%). The effect of ACUE participation on withdrawal was not significant, *F* (1, 310) = 1.26, *p* = .262, nor was the interaction between ACUE participation and term, *F* (1, 310) = 1.45, *p* = .229.

**Course grades.** There was a significant main effect of ACUE participation on the success rate, *F* (1, 310) = 4.08, *p* = .044, with higher success rates in courses taught by ACUE-credentialed faculty (*M* = 86.53%, *SD* = 51.47%) than in courses taught by matched faculty (*M* = 82.80%, *SD* = 68.81%). The effect of term on success rate was not significant, *F* (1, 310) < 0.01, *p* = .962, nor was the interaction between ACUE participation and term, *F* (1, 310) = 0.19, *p* = .663. There was a significant main effect of ACUE participation on the DFW rate, *F* (1, 310) = 4.11, *p* = .043, with lower DFW rates in courses taught by ACUE-credentialed faculty (*M* = 11.83%, *SD* = 48.17%) than in courses taught by matched faculty (*M* = 15.31%, *SD* = 64.99%). The effect of term on the DFW rate was not significant, *F* (1, 310) = 0.06, *p* = .811, nor was the interaction between ACUE participation and term, *F* (1, 310) = 0.05, *p* = .827.

**Course Evaluations**

There was a marginally significant main effect of term on course evaluations, *F* (1, 260) = 3.82, *p* = .052, with instructors receiving somewhat more positive course evaluations in the spring 2018 semester (*M* = 4.38, *SD* = 1.91) than in the fall 2017 semester (*M* = 4.25, *SD* = 2.25).

The effect of ACUE participation was not significant, $F$ (1, 260) = 0.34, $p$ = .562, nor was the interaction between ACUE participation and term, $F$ (1, 260) = 0.20, $p$ = .656.

**Student Questionnaire**

There was a significant effect of term on students' growth mindset, $F$ (1, 770) = 7.45, $p$ = .006, with students who completed the questionnaire at the end of the spring 2018 semester having a higher growth mindset ($M$ = 3.06, $SD$ = 1.22) than those who completed the questionnaire at the end of the fall 2017 semester ($M$ = 2.82, $SD$ = 1.21).

There was no difference between semesters in students' perceptions of classroom practice, $F$ (1, 818) = 0.05, $p$ = .824, their academic self-monitoring, $F$ (1, 812) = 0.19, $p$ = .662, or their academic communications, $F$ (1, 811) = 0.17, $p$ = .683. There was also not a significant difference between semesters in students' likelihood of recommending their instructor, $F$ (1, 806) = 0.04, $p$ = .852, or their perception of the course overall compared to other courses, $F$ (1, 806) = 0.11, $p$ = .738.

## Discussion

Even though ACUE-credentialed faculty had fewer years of experience at Delta State University compared to the faculty with whom they were matched, their students were more successful; they were more likely to earn As, Bs, Cs, and CRs and less likely to earn Ds, Fs, Ws, and NCs. In fact, 88 more students received As, Bs, Cs, or CRs than would have if the success rate for the ACUE sections were the same as the success rate for the matched faculty.

Interestingly, these impacts on grades occurred despite no difference in course evaluations, possibly indicating that student engagement is not a necessary precursor for impacts on student academic outcomes. However, another possibility is that the lack of significant difference in course evaluations is due to a ceiling effect (the overall average course evaluation was 4.38 on a 1 to 5 scale), which did not occur for grades. The other main finding is that growth mindset was higher among spring 2018 students of ACUE faculty compared to fall 2017 students of the same faculty.

These results are one piece of an ongoing evaluation of the impact of ACUE's Course in Effective Teaching Practices at Delta State University, representing outcomes that occurred while faculty were completing the course. Longitudinal evaluation is needed to follow up on faculty during the year or years after they have earned their credential. This is particularly important because the course is comprehensive, including over 200 techniques, and thus it may be difficult for faculty to implement all the techniques that they would like to during the first year. In fact, data collected from the faculty at Delta State University who participated during the 2017-2018 academic year indicate that while typical course completers implemented 27 new practices while they were taking the course, they planned to implement 45 additional practices. In addition, faculty members' implementation of the techniques they learned in the

ACUE course may improve as they continue to use and adjust them. Thus, it is possible that student impacts could be greater in the academic year following faculty members' completion of the ACUE course.

Furthermore, Delta State University plans to credential their entire faculty. This means that, over time, students at Delta State University could be taught by multiple ACUE-credentialed faculty, and, down the road, it is possible that every student at Delta State University will take at least one course, or even all their courses, with ACUE-credentialed instructors. Once this level of scale is achieved, there is the potential for institutional outcomes, specifically improvements in graduation and retention rates (MacCormack et al., 2018). In addition, such scale would allow for an examination of questions of "dosage" on students. In other words, how many courses does a student need to take with ACUE-credentialed faculty to impact their outcomes outside of those specific courses, such as their grades in other courses or likelihood of graduating? Future evaluation efforts, in partnership with Delta State University and other institutions, aim to answer such questions.

**Table 1**

*Demographics of ACUE and Matched Faculty*

| | | ACUE faculty | Matched faculty |
|---|---|---|---|
| Tenure | | | |
| | Not tenured | 7 (41.18%) | 5 (29.41%) |
| | Tenure-track | 10 (58.82%) | 10 (58.82%) |
| | Tenured | - | 2 (11.76%) |
| Status | | | |
| | Full-time | 17 (100%) | 16 (94.12%) |
| | Part-time | - | 1 (5.88%) |
| Rank | | | |
| | Instructor | 7 (41.18%) | 4 (23.53%) |
| | Assistant professor | 10 (58.82%) | 10 (58.82%) |
| | Associate professor | - | 1 (5.88%) |
| | Professor | - | 2 (11.76%) |

**Table 2**

*Demographics of Students Enrolled and Course Sections Taught by ACUE and Matched Faculty*

| | ACUE faculty | | Matched faculty | |
|---|---|---|---|---|
| | Fall 2017 | Spring 2018 | Fall 2017 | Spring 2018 |
| Freshmen | 147 (12.36%) | 117 (9.87%) | 233 (19.16%) | 71 (7.02%) |
| Sophomores | 189 (15.90%) | 167 (14.08%) | 168 (13.82%) | 79 (7.81%) |
| Juniors | 289 (24.31%) | 284 (23.95%) | 254 (20.89%) | 201 (19.88%) |
| Seniors | 454 (38.18%) | 478 (40.30%) | 499 (41.04%) | 471 (46.59%) |
| Graduate students | 110 (9.25%) | 140 (11.80%) | 62 (5.10%) | 189 (18.69%) |

**Table 3**

*Demographics of Student Survey Respondents*

| | | Fall 2017 | Spring 2018 |
|---|---|---|---|
| Class year | | | |
| | Freshmen | 3 (0.76%) | 35 (8.20%) |
| | Sophomores | 60 (15.27%) | 73 (17.10%) |
| | Juniors | 151 (38.42%) | 151 (35.36%) |
| | Seniors | 155 (39.44%) | 120 (28.10%) |
| | Graduate students | 18 (4.58%) | 40 (9.37%) |
| | None of the above | 2 (0.51%) | 1 (2.34%) |
| | No response | 4 (1.02%) | 7 (1.64%) |
| Enrollment | | | |
| | Full-time | 369 (93.89%) | 403 (94.38%) |
| | Part-time | 19 (4.83%) | 16 (3.75%) |
| | No response | 5 (1.27%) | 8 (1.87%) |

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