



Teaching Makes the Difference: Higher Student Success Rates at Delta State University

*Elizabeth K. Lawner, PhD
Research Associate, ACUE*

*Meghan Snow, EdM, MEd
Executive Director, Research, ACUE*

Copyright © 2018 by the Association of College and University Educators (ACUE)

All rights reserved.

No part of this document may be disclosed to a third party without the prior written consent of ACUE.

EXECUTIVE SUMMARY

Although 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 prepared 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) is closing this gap by offering online faculty development courses in effective teaching practices based on a thorough review of the research on teaching and learning in collaboration with experts in the scholarship of teaching and learning.

The foundational Course in Effective Teaching Practices was offered to the first cohort 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. Course completion, grades, and course evaluations were evaluated by 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. The impact on self-efficacy, growth mindset, and student perceptions of courses and instructors were assessed 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.

The 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.

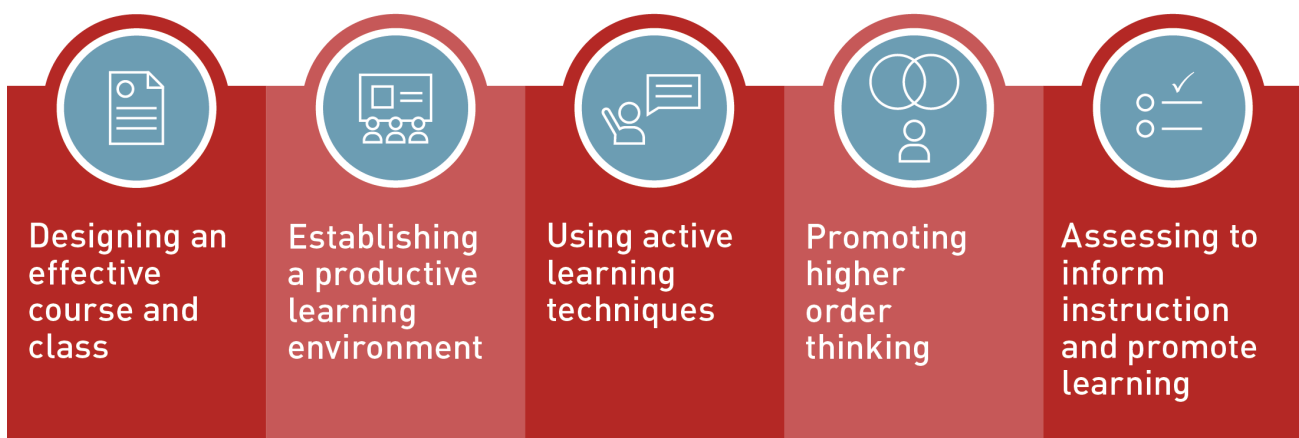
EVALUATION

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, although 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 impact on student engagement and learning. Faculty who satisfy course requirements for at least 25 modules earn a Certificate in Effective College Instruction endorsed by ACE. During

Figure 1

Five Major Units of Study

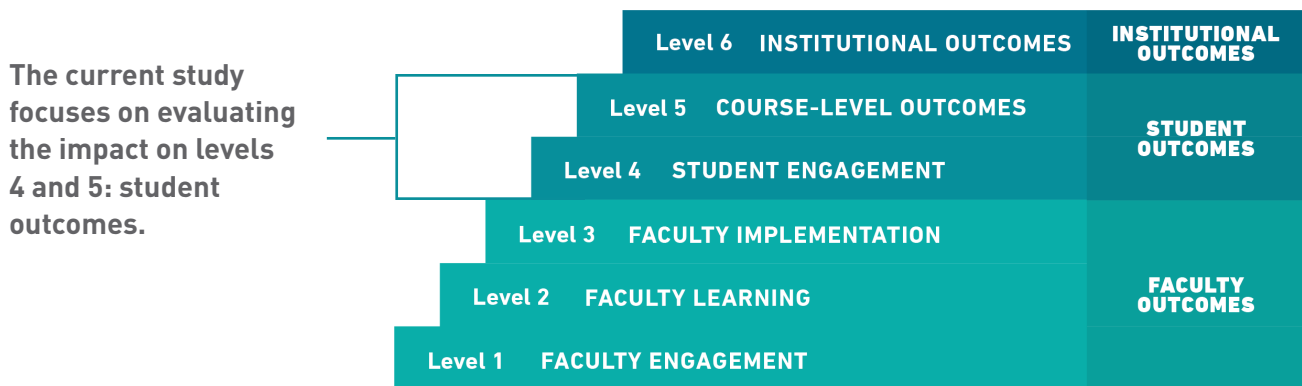


the 2017-2018 academic year, a cohort of 22 faculty at Delta State University participated in ACUE’s Course in Effective Teaching Practices, with 17 faculty earning the ACUE credential.

ACUE developed a six-level accountability method to evaluate the impact of faculty development on teaching practices and student outcomes (MacCormack, Snow, Gyrko, & 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.

Figure 2

Six-Level Accountability Method to Evaluate the Impact of Faculty Development on Teaching Practices and 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)

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%)

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 Figure 3). Additionally, 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 were analyzed.

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. A total of 820 responses were

received 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 Figure 4, 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 Figure 4).

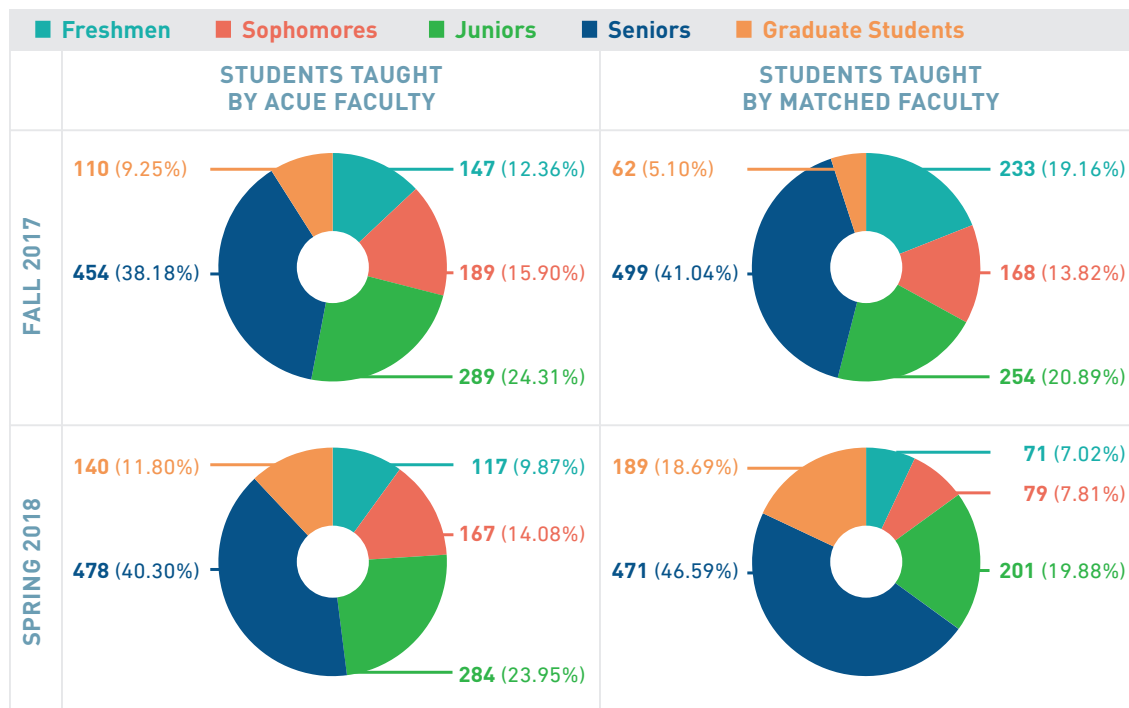
Figure 3*Demographics of Students Enrolled in Course Sections Taught by ACUE and Matched Faculty*

Figure 4

Demographics of Student Survey Respondents

FALL 2017

Class year:	FRESHMAN	SOPHMORE	JUNIOR	SENIOR	GRADUATE STUDENT
	0.76% (3)	15.27% (60)	38.42% (151)	39.44% (155)	4.58% (18)
NO RESPONSE: 1.02% (4) NONE OF THE ABOVE: 0.51% (2)					

Enrollment status:	FULL TIME	PART TIME
	93.89% (369)	4.83% (19)
NO RESPONSE: 1.27% (5)		

SPRING 2018

Class year:	FRESHMAN	SOPHMORE	JUNIOR	SENIOR	GRADUATE STUDENT
	8.20% (35)	17.10% (73)	35.36% (151)	28.10% (120)	9.37% (40)
NO RESPONSE: 1.64% (7) NONE OF THE ABOVE: 0.23% (1)					

Enrollment status:	FULL TIME	PART TIME
	94.38% (403)	3.75% (16)
NO RESPONSE: 1.87% (8)		

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 responses of "not applicable". 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

“...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”

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 approximately 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 ($M = 1.50\%$, $SD = 14.60\%$) 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, $F(1, 310) = 1.45, p = .229$.

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, $F(1, 309) = 4.02, p = .046$.

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, $F(1, 310) = 0.19, p =$

Students in course sections taught by ACUE-credentialed faculty had significantly higher success rates compared to students in course sections taught by matched faculty.

$.663$. 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, $F(1, 310) = 0.05, p = .827$.

Figure 5

Effect of ACUE Participation on Success Rate



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 ($M = 2.82, SD = 1.21$).

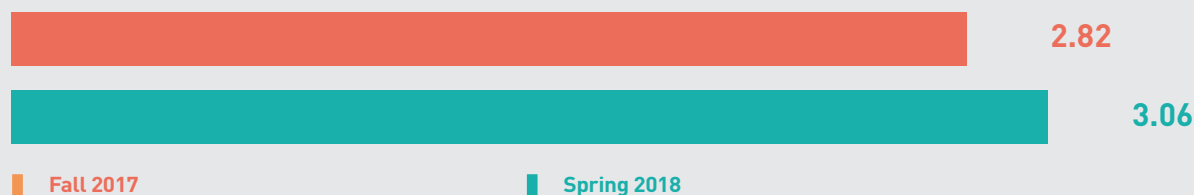
In the spring 2018 semester, students of ACUE-credentialed faculty reported having a significantly greater growth mindset compared to students of the same faculty in the fall 2017 semester.

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, $F(1, 806) = 0.11, p = .738$.

Figure 6

Effect of term on students' growth mindset

MEAN



DISCUSSION

Although 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. One 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 year they engage in the course. For this reason, faculty continue to have access to the course for one year following their completion. 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.

REFERENCES

- American Council on Education. (2017). Contributors to ACE's teaching and learning scholarship. Retrieved from <http://www.acenet.edu/news-room/Pages/Scholarship-of-Teaching-and-Learning-Contributors.aspx>
- Armbruster, P., Patel, M., Johnson, E., & Weiss, M. (2009). Active learning and student-centered pedagogy improve student attitudes and performance in introductory biology. *CBE Life Sciences Education, 8*, 203–213. <https://doi.org/10.1187/cbe.09-03-0025>
- Association of College and University Educators. (2016). *The essentials of college instruction: ACUE's Course in Effective Teaching Practices. A comprehensive bibliography*. New York, NY: Author.
- Association of College and University Educators. (2017, May 31). ACUE's learning design earns Quality Matters certification [Blog post]. Retrieved from <https://community.acue.org/blog/acue-learning-design-earns-quality-matters-certification/>
- Burrowes, P. A. (2003). A student-centered approach to teaching general biology that really works: Lord's constructivist model put to a test. *The American Biology Teacher, 65*, 491–502. <https://doi.org/10.2307/4451548>
- The College System of Tennessee. (n.d.) *Getting to know our students survey*. Retrieved from https://www.tbr.edu/sites/tbr.edu/files/media/2016/12/Getting%20to%20Know%20Our%20Students%20Survey_1.pdf
- Commission on the Future of Undergraduate Education. (2017). *The future of undergraduate education: The future of America*. Cambridge, MA: American Academy of Arts & Sciences.
- Condon, W., Iverson, E. R., Manduca, C. A., Rutz, C., & Willett, G. (2016). *Faculty development and student learning: Assessing the connections*. Bloomington: Indiana University Press.
- Devlin, M. (2008). Research challenges inherent in determining improvement in university teaching. *Issues in Educational Research, 18*, 12–25.
- Dweck, C. S. (2000). *Self-theories: Their role in motivation, personality and development*. Philadelphia, PA: Taylor & Francis.
- Freeman, S., Haak, D., & Wenderoth, M. P. (2011). Increased course structure improves performance in introductory biology. *CBE Life Sciences Education, 10*, 175–186. <https://doi.org/10.1187/cbe.10-08-0105>
- Hattie, J. (2009). *Visible learning: A synthesis of over 800 meta-analyses relating to achievement*. New York, NY: Routledge.
- Hénard, F., & Roseveare, D. (2012). *Fostering quality teaching in higher education: Policies and practices*. Retrieved from <https://www.oecd.org/edu/imhe/QT%20policies%20and%20practices.pdf>
- Hines, S. R. (2007). *An investigation of faculty development program assessment practices* (Doctoral dissertation). Retrieved from ProQuest Dissertations. (3358979)

- Kember, D., & Gow, L. (1994). Orientations to teaching and their effect on the quality of student learning. *Journal of Higher Education, 65*, 58–74. <https://doi.org/10.2307/2943877>
- Kember, D., Ho, A., & Hong, C. (2008). The importance of establishing relevance in motivating student learning. *Active Learning in Higher Education, 9*, 249–263. <https://doi.org/10.1177/1469787408095849>
- MacCormack, P., Snow, M., Gyurko, J., & Candio Sekel, J. (2018). *Connecting the dots: A proposed accountability method for evaluating the efficacy of faculty development and its impact on student outcomes*. New York, NY: Association of College and University Educators.
- Marton, F., Hounsell, D., & Entwistle, N. (Eds.). (1997). *The experience of learning: Implications for teaching and studying in higher education* (2nd ed.). Edinburgh, Scotland: Scottish Academic Press.
- Mazur, E. (2009). Farewell, lecture? *Science, 323*(5910), 50–51. <https://doi.org/10.1126/science.1168927>
- Prosser, M., & Trigwell, K. (2006). Confirmatory factor analysis of the Approaches to Teaching Inventory. *British Journal of Educational Psychology, 76*, 405–419. <https://doi.org/10.1348/000709905X43571>
- Seidman, A. (2012). *College student retention: Formula for student success* (2nd ed.). Lanham, MD: Rowman & Littlefield.
- Zimmerman, B. J. (2002). Becoming a self-regulated learner: An overview. *Theory Into Practice, 41*, 64–70. https://doi.org/10.1207/s15430421tip4102_2



About ACUE

The Association of College and University Educators (ACUE) believes that all college students deserve an extraordinary education and that faculty members play a critical role in their success. In partnership with institutions of higher education nationwide, ACUE supports and credentials faculty members in the use of evidence-based teaching practices that drive student engagement, retention, and learning. Faculty members who complete ACUE's Course in Effective Teaching Practices earn a Certificate in Effective College Instruction endorsed by the American Council on Education. ACUE's Community of Professional Practice connects college educators from across the country through member forums, podcasts, and updates on the latest developments in the scholarship of teaching and learning.

To learn more, visit acue.org.

Association of College and University Educators
85 Broad St., 17th Floor
New York, NY 10004
www.acue.org

