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Center for Teaching Excellence  
Miami University



# The Impact of the Association of College and University Educators (ACUE) Certification on Instructor Evaluations and Student Success Rates

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*Professional development programs can help college instructors better incorporate evidence-based teaching practices. This study examines the impact of a well-known resource: the Association of College and University Educators (ACUE) Course in Effective Teaching Practices. ACUE advertises that its course has significant positive impacts on instructor evaluations and DFW rates; however, the evidence supporting these claims comes from studies either conducted in conjunction with ACUE or involving small sample sizes. This study largely corroborates existing research by studying a larger sample size and without financial or other incentives offered by ACUE.*

An abundance of evidence exists about what effective teaching looks like and why it works (Bonwell & Eison, 1991; Lang, 2021; Zakrajsek & Nilson, 2023). In particular, there is a great deal of evidence that active and student-centered teaching techniques lead to greater content mastery and course success for college students in a variety of disciplines (Freeman et al., 2011; Freeman et al., 2014; McCarthy & Anderson, 2000; Prince, 2004; Waitkus, 2006). The evidence, however, shows that such teaching is still not widely practiced (Lammers & Murphy, 2002; Lund et al., 2015; Sax et al., 1999; Stains et al., 2018; Stolzenberg et al., 2019). This demonstrates a need for impactful faculty professional development around teaching. This study looks at the impact of a well-known professional development resource for effective instruction in higher education: the Association of College and University Educators (ACUE) Course in Effective Teaching Practices. ACUE advertises that its course has significant positive impacts on both student success and satisfaction, and there is some evidence to back up these claims (ACUE 2024). However, the available studies are either conducted in conjunction with ACUE or else based on small sample sizes. This study aims to contribute to an understanding of the ACUE Course's impact with a large sample size and with no financial or other incentives offered by ACUE.

## Literature Review

Students are more successful when instructors use best practices in the design and delivery of their

courses. Undergraduate students master content and have higher success rates in highly structured courses where the instructor incorporates more active and student-centered learning (Freeman et al., 2011; Freeman et al., 2014; Prince, 2004). This is not only the case in STEM courses, but also in the humanities and social sciences (McCarthy & Anderson 2000; Waitkus, 2006). Despite the evidence, however, effective teaching practices are not necessarily the norm. Multiple studies have found that the traditional lecture remains the most common instructional strategy on college campuses across disciplines (Lammers & Murphy, 2002; Lund et al., 2015; Stains et al., 2018). Indeed, matters may be getting worse. The Higher Education Research Institute found that 50.3% of U.S. instructors at both two- and four-year institutions report using “extensive lecturing” in their undergraduate courses (Stolzenberg et al., 2017, p. 33), up from 47.2% in a previous survey (Sax et al., 1999). A recent review of the literature on lecturing in higher education finds that the use of recorded lectures has increased since the COVID-19 pandemic, but at the same time cautions that terminological discrepancies and differences in understanding about what a lecture is make it difficult to draw firm conclusions about the use and efficacy of lecturing in college classrooms (Crawford & Parsell, 2025). There appears to be a need for updated investigations of the extent to which teaching practices have evolved over the past couple of decades; however, the bulk of available evidence suggests a need for increased quality professional development in best practices for teaching college students.

Various organizations have developed resources to address this need. One prominent resource is the Association of College and University Educators Course in Effective Teaching Practices (ACUE Course), which is endorsed by the American Council on Education. The ACUE Course is evidence-based and structured around five units: course and class design, learning environments, active learning techniques, higher-order thinking, and assessment (Sekel, n.d.). These five units are covered in 25 online modules, each of which provides an opportunity to learn, implement, reflect, and discuss. A facilitator guides instructors through the course, encouraging them and providing feedback along the way. Faculty who satisfactorily complete all 25 modules receive their ACUE Credential, which is typically earned in one academic year (ACUE, 2024).

Some of ACUE's claims about the effectiveness of its courses are based on student success rates. These rates are measured by reduction in students dropping the course or receiving grades of D or F (commonly known as DFW rates). ACUE reports that completion of its course leads to a 3% reduction in DFW rates for courses taught by those instructors (ACUE, 2024). It also claims that students at institutions whose instructors participate in their courses are more inspired by their instructors (ACUE, 2024). Though ACUE does not specify where the data supporting these claims are collected, it does provide data through "case studies" and "impact reports" published on its website. These studies and reports suggest that the ACUE Course has a positive impact on student learning in a number of ways, but the relationship between these impacts and the overall claims on ACUE's website is unclear.

One study found significant impacts on student success one year after instructors completed the ACUE Course. Lawner et al. (2021) looked at passing rates, DFW rates, and course grades for courses taught in 2019-2020 at Broward College and found that, while students in both sets of courses showed significant improvement on these measures, the improvement was significantly larger for those taught by ACUE-trained instructors. Another study looked at the impacts on student success during the year instructors completed the course. Lawner and Snow (2018) examined course completion, course grades, DFW rates, and student evaluations for courses taught in 2017-2018 at Delta State University and found that there were significant effects of ACUE completion on DFW rates, reporting lower rates in courses taught by ACUE instructors than in those taught by non-ACUE instructors. At the same time, the researchers found no significant effect of ACUE completion on course evaluations.

A third study investigated the impacts on student success and course evaluations both during the year instructors completed the ACE Course and in the subsequent year. Lawner and Snow (2019) focused on course evaluations, student grades, and DFW rates at

the University of Nevada, Reno in the 2017-2018 and 2018-2019 academic years and found that student evaluations of ACUE instructors improved over time and were higher than those of non-ACUE instructors in the year after the ACUE instructors earned their credential. The researchers also found that average student grades for ACUE instructors were stable over time, whereas they fell for non-ACUE instructors. The researchers did not find as robust an effect of ACUE completion on DFW rates, although they did find that, mostly in the year after they earned their credential, ACUE instructors had significantly lower DFW rates in their courses compared to rates in courses taught by non-ACUE instructors in the spring 2018 term.

The foregoing studies addressed the impact of ACUE's academic year-long course. ACUE has also published studies regarding the impact of its microcredential courses, which cover a portion of the academic year-long course and may be stacked to gain the full credential. For example, three studies looked at data from the University of Southern Mississippi (USM), where instructors are offered three microcredential courses and, if they complete all three, receive the full credential earned through the academic year-long course. In one study, Lawner et al. (2021) examined completion rates, passing rates, success rates, and GPA for all courses taken between fall 2015 and spring 2020 at USM. They then assigned a "dosage" score for each student, calculated based on the number of courses taken with an instructor who had either completed or begun an ACUE microcredential. The more ACUE experience the instructor teaching the student had, the higher the student's dosage score. Results indicated that students with higher dosages had more success along all four measures above, and this result held for these students, even in courses taught by non-ACUE instructors. Thus, having been instructed by ACUE instructors appears to impact students' success even in *other* courses.

Two other studies looked specifically at gateway course outcomes at USM. Pippins et al. (2021a) focused on grades, DFW rates, completion rates, and passing rates in gateway courses at USM from fall 2016 to spring 2020, comparing these outcomes for courses taught by instructors who had taken an ACUE microcredential course during this time with those taught by instructors who had not. The researchers found that average course grades, passing rates, and DFW rates improved for students of ACUE instructors while they were taking the microcredential, and that passing rates and DFW rates also improved for students taking courses with ACUE instructors in the years after they had completed the microcredential. Pippins et al. (2021b) were concerned with course outcomes during the same time period for students who took a subsequent course in the same field *after* they had taken a gateway course at USM. Again, they compared the effects of taking a gateway course with an instructor who had completed

an ACUE microcredential with taking such a course with an instructor who had not. They found that course grades were “marginally better” and rates of DFW grades were significantly lower for students who had taken a gateway course with an ACUE instructor in a prior term.

This body of evidence suggests that some amount of instructor engagement with the ACUE Course has a positive impact on student success. In particular, the evidence suggests that instructors who complete the academic year-long ACUE Course have a positive impact on student success in two main ways: Students are more successful in their courses and evaluate them more highly. But a gap remains in the literature. It would be useful to have peer-reviewed studies run and published independently of ACUE to corroborate the claims that the ACUE Course has such positive impacts. It would be especially desirable if these studies were able to establish clearly the specific impacts cited by ACUE on its website. For example, how was the cited impact of a 3% reduction in DFW rates for course taught by ACUE instructors determined? Similarly, it would be valuable to know where the claim that ACUE leads to students being more inspired by their instructors comes from. This study aims to contribute to filling this gap in the literature.

The number of peer-reviewed studies looking at ACUE Course impact is much lower than the number of studies published by ACUE itself, but the peer-reviewed literature does suggest that ACUE Course completion may have a positive impact on both student success and satisfaction. Budziak et al. (2022) found that courses taught by ACUE instructors had 3.7% lower DFW rates than matched courses taught by non-ACUE instructors. This finding is promising and in the range of the impact on DFW touted by ACUE, but it rests on a small sample size of only 30 instructors over one semester.

Wang (2024) looked at course grades and student evaluations for a single course, comparing data from a semester when practices learned in the ACUE Course were implemented with the previous semester's data, before these practices were implemented. However, it is not clear when the instructor completed the ACUE Course; thus, it is unknown whether this study is testing impact *during* or *after* ACUE Course completion. This study found that students were more satisfied with the course and their experience in it for the semester in which ACUE practices were implemented than for the semester before; yet it also finds that the DFW rate for the ACUE semester was higher than for the previous one. Thus, the scant evidence from peer-reviewed studies of the ACUE Course's impact is mixed and largely derived from studies with small sample sizes.

## Significance of the Study

Overall, some evidence supports that the professional development training in the area of teaching

offered by ACUE has a positive impact on both student satisfaction and performance. But it is not clear how to interpret this evidence. For one thing, the available studies do not all examine the effects of the same product. Some studies measure the impact of the academic year-long course, whereas others measure the impact of the microcredentials. In addition, some studies look at impacts after instructors have earned the full credential or completed the microcredential, whereas others look at impacts while instructors are engaged in an ACUE Course. Moreover, even the studies funded and published by ACUE have serious, unacknowledged limitations—for example, Lawner and Snow (2018) compare ACUE instructors with less than a year of experience to non-ACUE instructors with, on average, just over seven years' experience. The peer-reviewed studies by Budziak et al. (2022) and Wang (2024) do not appear to have this sort of limitation, but they do have small sample sizes and mixed results. Finally, it is not clear how the evidence, even in the studies funded by ACUE itself, relates to the impacts ACUE claims on its own website. That is, it is not clear exactly how ACUE arrives at the claim that its course reduces DFW rates by 3% and leads to students being inspired by their instructors (ACUE, 2024).

This study seeks to fill a gap in the literature by evaluating the impact of instructor ACUE Course completion on student success and satisfaction. It was conducted at Sam Houston State University (SHSU), a public institution located in Huntsville, Texas, with a total enrollment of 21,612 students in fall 2021 (SHSU, n.d.). It is both founded on a large sample and conducted without any funding or other incentive from ACUE. The research was guided by the following research question: What are the effects of ACUE instructor training on students' evaluations of instructors and student success rates?

## Methodology

The purpose of this study was to examine the impact of ACUE Certification on instructor evaluations (the IDEA student evaluation instrument is deployed at the end of each term) and DFW rates for all courses taught at SHSU. The study also investigated the specific impact of ACUE Certification on introductory courses. This section provides the context, procedures, and plan for the data analyses used to detect differences between courses that are taught by ACUE instructors and those that are not. Because the treatment and control groups could not be randomized, the study used a quasi-experimental matched research design.

## Context

SHSU serves a diverse student body, with 48.24% identifying as White, 26.09% as Hispanic or Latino, 16.16% as Black or African American, 2.52% as Asian,

3.29% as two or more races, 0.61% as American Indian or Alaska Native, and 0.12% as Native Hawaiian or Other Pacific Islander (SHSU, n.d.). SHSU's designation as a Hispanic-Serving Institution (HSI) reflects its commitment to supporting historically underrepresented populations. The majority of students are drawn from the Greater Houston area and East Texas, and many are first-generation college students.

### *Participating Courses*

First, data were obtained from the university instructional research office that included information on all courses taught during the 2021-2022 academic year. These data were then coded to indicate whether or not the course was taught by a trained ACUE instructor. Of the 8,165 qualifying courses offered in 2021 and 2022, 860 of those courses were taught by ACUE instructors (ACUE, 2024). Propensity score matching was used to match ACUE Courses and other courses using college, rank, race, and gender as covariates. Using a distance caliper of 0.20, 854 ACUE instructors-taught courses were statically matched with 853 courses taught by other instructors (Control). Originally, mean difference effects exceeded the recommended cutoff of 0.20; however, these effects were negligible after the matching process, indicating better balance between groups (see Table 1).

Tables 2-5 report the descriptive data of the sample included after the matching process. The data summarize the instructor demographics for each course included in the analysis.

### *Procedures*

The ACUE Course is one among several professional development programs in the area of teaching offered at SHSU. Each spring, a call for applications is sent to instructors university-wide. (The ACUE Course is open not just to instructors, but also to instructional staff; the overwhelming number of participants are instructors.) Applicants complete a short survey indicating their rank, college, department, years of teaching experience at the institution, overall number of courses to be taught in the following academic year, ability to devote time to the ACUE Course, and a narrative statement about their interests and goals in taking the course. After a review of applications by a committee, acceptances are sent out over the summer for a cohort of up to 33 participants for the course that begins in the first week of September, about two weeks into the fall term. An instructor who completed the ACUE Course in an earlier cohort serves as an on-campus facilitator for the new cohort. The facilitator organizes in-person meetings about once a month for the entire academic year, sends weekly email reminders and encouragement, helps to track participants' progress, and holds group catch-up sessions each spring to encourage course completion.

All ACUE Course completers receive a stipend, as does the facilitator. Each fall, the university's Teaching and Learning Center hosts a pinning ceremony, to which all completers, their department chairs and deans, and the Provost and President are invited, along with those who have been accepted to the next cohort and an ACUE representative.

Students at SHSU fill out course evaluations at the end of each term using the IDEA Education long form instrument (IDEA, n.d.). Prior to the instrument's release date to students, instructors select from among a list of 13 objectives, marking them as Essential, Important, or Minor. In addition to rating the course on all 13 objectives (students do not know the instructor's importance rating for the objectives), students provide an Excellent Teacher and Excellent Course rating. Also, students provide ratings of various instructional strategies, their desire to take the course, and more. Each of these ratings is on a five-point scale. This study looked at the raw mean scores for Excellent Teacher, Excellent Course, and Summary, which is a weighted average of student ratings of the Essential and Important objectives as well as Teacher and Course.

This university calculates the DFW rate for a course by taking the number of students who received a grade of D, F, or NC or who dropped the course and dividing it by the total number of enrolled students after the census period, which is the 12<sup>th</sup> class day for 15-week courses. Students who transfer courses; drop before the census date; resign from the academic period; or receive an Audit, In Progress, or Incomplete grade are not included in either the numerator or denominator.

### *Data Analysis*

After balancing the groups, a multivariate analysis of covariance (MANCOVA) was used. The MANCOVA is an extension of the analysis of variance (ANCOVA) that examines the effect of independent variables on multiple dependent variables while controlling for covariates. It is used when there are multiple correlated outcome variables and researchers want to determine whether group differences exist while accounting for extraneous variables. A MANCOVA helps in assessing overall group effects while reducing error variance and increasing statistical power.

Subsequently, ANCOVAs were conducted to examine statistical differences between groups while controlling for the number of students who enrolled and completed the course. The enrollment covariate was controlled for in the analysis rather than with propensity scores because it was level two data. After conducting the ANCOVA, effect sizes were also computed. Effect size measures the magnitude of a relationship or difference in research, providing practical significance beyond *p*-values. It helps interpret the strength of findings, compare studies, and assess real-world impact.

Table 1  
Propensity Score Matching Summary of Balance

	<i>Unmatched (n = 8,165)</i>			<i>Matched (n = 1,707)</i>		
	<i>M ACUE</i>	<i>M Control</i>	<i>d</i>	<i>M ACUE</i>	<i>M Control</i>	<i>d</i>
College	6.11	5.46	0.30	6.09	6.04	0.02
Race	6.62	6.82	-0.09	6.65	6.55	0.04
Gender	1.38	1.48	-0.20	1.38	1.38	0.01

Table 2  
Faculty Race by Course

	<i>Control</i>		<i>ACUE</i>	
	<i>N</i>	<i>%</i>	<i>N</i>	<i>%</i>
African American	73	8.5	68	8.0
American Indian	10	1.2	10	1.2
Asian	52	6.1	52	6.1
Hispanic	64	7.5	45	5.3
International	42	4.9	45	5.3
Multiple Races	11	1.3	21	2.5
White	602	70.5	613	71.8

Table 3  
Faculty Gender by Course

	<i>Control</i>		<i>ACUE</i>	
	<i>N</i>	<i>%</i>	<i>N</i>	<i>%</i>
Female	530	62.1	526	61.6
Male	324	37.9	328	38.4

## Results

### Overall Impact on Courses

The descriptive statistics are summarized in Table 6. A one-way MANCOVA was performed on the dependent variables: IDEA raw mean, Excellent Teacher, Excellent Course, and DFW rates. According to Wilks' criterion, the combined dependent variables were significantly

different by group ( $F[4, 1,701] = 11.83, p < .001$ , Wilk's  $\Lambda = 0.97$ , partial  $\eta^2 = 0.03$ ) after controlling for the number of students in the course. To further investigate the dependent variables independently, univariate ANCOVAs were performed. After controlling for the number of students enrolled in the course, IDEA raw mean, Excellent Teacher, and Excellent Course were statistically significantly higher in ACUE Courses, and DFW rates were found to be significantly lower (see Table 7).

Table 4  
Faculty College by Course

	Control		ACUE	
	N	%	N	%
Arts and Media	64	7.5	59	6.9
Business Administration	98	11.5	89	10.4
Criminal Justice	88	10.3	88	10.3
Education	53	6.2	53	6.2
Health Sciences	72	8.4	82	9.6
Humanities and Social Sciences	311	36.4	314	36.8
Newton Gresham Library	2	0.2	13	1.5
Science and Engineering Technology	166	19.4	156	18.3

### Impact on Introductory Courses

Of the 2,408 introductory (1000- and 2000-level) courses offered at SHSU in 2021 and 2022, 222 of those courses were taught by ACUE instructors (ACUE). Propensity score matching was used to match ACUE Courses and other courses using college, rank, race, and gender as covariates. Using a distance caliper of 0.20, 223 introductory courses taught by ACUE instructors were statistically matched with 222 introductory courses taught by other instructors (Control). Originally, mean difference effects exceeded the recommended cutoff of 0.20; however, these effects were negligible after the matching process indicating better balance between groups.

The descriptive statistics are summarized in Table 8. A one-way MANCOVA was performed on the dependent variables: IDEA raw mean, Excellent Teacher, Excellent Course, and DFW rates. According to Wilks' criterion, the combined dependent variables were significantly different by group ( $F[4, 438] = 5.996, p < .001$ , Wilk's  $\Lambda = 0.948$ , partial  $\eta^2 = 0.052$ ) after controlling for the number of students in the course. To further investigate the dependent variables independently, univariate ANCOVAs were performed. After controlling for the number of students enrolled in the course, IDEA raw mean, excellent teacher, and excellent course were statistically significantly higher in ACUE Courses, and DFW rates were significantly lower (see Table 9).

### Summary of Results

The data preparation process involved using propensity score matching to balance groups and reduce

selection bias. This ensured that courses taught by ACUE instructors were compared to similar non-ACUE courses. MANCOVA and ANCOVA analyses were performed to examine differences between these groups. Results showed that courses taught by ACUE instructors had significantly higher IDEA Mean, Excellent Teacher, and Excellent Course scores. Additionally, these courses had significantly lower DFW rates, indicating improved student outcomes.

### Discussion

This study found that instructors taking the ACUE Course does, indeed, have a significant positive impact on student performance and satisfaction. ACUE instructors are rated significantly higher by students on IDEA, and DFW rates in their courses are significantly lower. ACUE instructors who teach introductory courses are rated significantly higher on IDEA and DFW rates are significantly lower than those instructors who teach introductory level courses and are not ACUE certified. These findings align with and extend the existing body of research on the impact of ACUE Courses on educational outcomes. Previous studies have demonstrated that ACUE Courses, which are designed to enhance teaching effectiveness through evidence-based practices, generally lead to improvements in student learning, engagement, and success (Budziak et al., 2022; Lawner et al., 2021; Lawner & Snow, 2018, 2019; Pippins et al., 2021a, b; Pippins et al., 2022; Wang, 2024).

Consistent with previous research, this study found that courses taught by instructors who completed ACUE certification received more positive evaluations from

Table 5  
Faculty Rank by Course

<i>Control</i>			<i>ACUE</i>		
<b>Rank</b>	<b>N</b>	<b>%</b>	<b>Rank</b>	<b>N</b>	<b>%</b>
Adjunct Faculty	20	2.3	Adjunct Faculty	23	2.7
Assistant Professor	161	18.9	Assistant Professor	282	33.0
Associate Professor	138	16.2	Assistant Professor/Assistant Dean	3	0.4
Associate Professor/Department Chair	8	0.9	Associate Professor	186	21.8
Clinical Assistant Professor	24	2.8	Associate Professor of Practice	3	0.4
Distinguished Professor	1	0.1	Associate Professor/Acting Chair	4	0.5
Lecturer	112	13.1	Associate Professor/Associate Dean	1	0.1
Lecturer-Pool Faculty	243	28.5	Clinical Assistant Professor	35	4.1
Professor	80	9.4	Clinical Associate Professor	22	2.6
Professor/Associate Dean	1	0.1	Clinical Professor	4	0.5
Professor/Department Chair	9	1.1	Lecturer	123	14.4
Teaching Assistant	34	4.0	Lecturer-Pool Faculty	77	9.0
Visiting Assistant Professor	23	2.7	Professor	69	8.1
			Professor/Acting Chair	2	0.2
			Professor/Associate Dean	4	0.5
			Professor/Department Chair	12	1.4
			Teaching Assistant	4	0.5

students. This study, specifically, found that courses taught by ACUE instructors received higher ratings for IDEA's raw mean score as well as Excellent Teacher and Excellent Course scores. This corroborates earlier findings that ACUE training equips educators with effective teaching strategies that positively influence student perceptions of their instructors' abilities and the overall course quality.

The lower DFW rates in ACUE Courses found in this study add to the evidence that ACUE training can lead to higher student retention and success rates. In fact, this study found that the reduction in DFW rate for ACUE Courses is 3.33% in general and 3.73% in introductory courses. These figures are very close to the 3% reduction in DFW rates advertised on the ACUE website and almost identical to the 3.7% reduction found by Budziak

et al. (2022). Interestingly, they also suggest that the increase in DFW rates for ACUE instructor courses found by Wang (2024) may be an outlier. This study supports the notion that effective teaching practices fostered by ACUE training can create more engaging and supportive learning environments, thereby reducing the likelihood of students dropping out or failing courses.

The study's use of propensity score matching to reduce selection bias, as well as MANCOVAs and ANCOVAs to control for the number of students in the course, ensures that the observed differences are not simply due to variations in class size or instructor demographics. This methodological rigor enhances the validity of the findings and is a strength compared to previous studies that may not have controlled for such confounding variables.

Table 6  
**ACUE Descriptive Statistics (N = 1,707)**

		<i>M</i>	<i>SD</i>	<i>N</i>
IDEA	Control	4.103	0.564	853
	ACUE	4.213	0.495	854
Teacher	Control	4.292	0.656	853
	ACUE	4.425	0.566	854
Course	Control	4.211	0.647	853
	ACUE	4.293	0.566	854
DFW	Control	16.066%	18.325%	853
	ACUE	12.735%	14.228%	854

The results of this study strengthen the evidence base for the positive impact of the ACUE Course on various educational outcomes. By demonstrating significant improvements in student evaluations of teaching, course quality, and reduced DFW rates, this study provides robust support for the effectiveness of ACUE training. These findings are consistent with and build upon previous research, affirming the value of ACUE's approach to professional development for educators.

### Limitations

One of the primary limitations of this quasi-experimental study is the absence of random assignment to the treatment and control groups. Without randomization, there is a higher risk of selection bias, which may affect the internal validity of the study. Differences between the groups prior to the intervention could influence the outcomes, making it challenging to attribute changes solely to the intervention. To help mitigate this limitation, propensity score matching was used.

The effectiveness of propensity score matching depends on the quality of the matches. While propensity score matching helps to balance observed covariates between treatment and control groups, it cannot account for unobserved variables that might influence the treatment assignment and outcomes. Because ethical and practical considerations often limit the ability to manipulate variables or control conditions as rigorously as in randomized controlled trials, propensity score matching was used in an attempt to better balance the treatment and control groups.

Some other limitations of this study arise in relation to its aim of investigating the findings of previous stud-

ies, including both those funded by ACUE and those that are independently peer-reviewed. These limitations suggest potentially fruitful avenues for further research.

First, as already mentioned, ACUE offers both the academic year-long course and microcredentials. This study focused only on the former. It would be helpful for other studies, with large sample sizes and run independently of ACUE, to look at the impacts of microcredentials. Second, this study occurred in a context where ACUE was not the only source of teaching-related professional development. Not only is it unclear whether this is the case at other institutions included in the above-mentioned studies, but it also makes it impossible to claim with certainty that the impacts found are due solely to completion of the ACUE Course. Further investigation should look at instructors who have completed only the ACUE Course as compared with instructors who have completed other teaching-related professional development programs at the university. Third, neither the measures nor populations studied here are isomorphic with the measures or populations of previous studies. For instance, this study focused on IDEA student evaluations, but this instrument was not used in any of the other studies to gauge student satisfaction with courses. And the populations of both instructors and students at the different institutions in which the various studies were conducted are themselves different. Some unobserved variables that might influence outcomes may be due to aspects of either or both the student and instructor populations at these universities, and differences in these populations may lead to differences in such variables. While it is not possible to control for this entirely, it may be worth conducting future studies that look at similar student

Table 7  
**ANCOVA Summary Table for ACUE**

<i>Source</i>		<i>Type III SS</i>	<i>df</i>	<i>MS</i>	<i>F</i>	<i>p</i>	$\eta_p^2$
Corrected Model	IDEA	7.422	2	3.711	13.243	0.000	0.015
	Teacher	8.242	2	4.121	10.988	0.000	0.013
	Course	3.264	2	1.632	4.417	0.012	0.005
	DFW	.858	2	0.429	16.072	0.000	0.019
Intercept	IDEA	11722.998	1	11722.998	41836.860	0.000	0.961
	Teacher	12748.981	1	12748.981	33992.923	0.000	0.952
	Course	12095.385	1	12095.385	32735.211	0.000	0.951
	DFW	10.396	1	10.396	389.370	0.000	0.186
Completed	IDEA	2.252	1	2.252	8.036	0.005	0.005
	Teacher	0.696	1	0.696	1.856	0.173	0.001
	Course	0.352	1	0.352	0.951	0.330	0.001
	DFW	0.385	1	0.385	14.410	0.000	0.008
ACUE	IDEA	5.052	1	5.052	18.029	0.000	0.010
	Teacher	7.465	1	7.465	19.903	0.000	0.012
	Course	2.877	1	2.877	7.786	0.005	0.005
	DFW	0.459	1	0.459	17.184	0.000	0.010
Error	IDEA	477.473	1704	0.280			
	Teacher	639.082	1704	0.375			
	Course	629.614	1704	0.369			
	DFW	45.494	1704	0.027			
Total	IDEA	29998.770	1707				
	Teacher	33073.433	1707				
	Course	31493.196	1707				
	DFW	81.748	1707				
Corrected Total	IDEA	484.895	1706				
	Teacher	647.324	1706				
	Course	632.878	1706				
	DFW	46.352	1706				

and instructor populations at other universities, as well as studies that look at interestingly different instructor and student populations. This would provide for a more well-rounded assessment of ACUE's impact.

#### *Further Research*

This study highlights the significant impact of the ACUE Course on student performance and satisfac-

Table 8  
ACUE Intro Courses Descriptive Statistics

	ACUE	M	SD	N
IDEA	Control	3.962	0.559	222
	ACUE	4.133	0.479	222
Teacher	Control	4.172	0.664	222
	ACUE	4.417	0.483	222
Course	Control	4.071	0.658	222
	ACUE	4.257	0.553	222
DFW	Control	25.21%	21.17%	222
	ACUE	21.48%	17.25%	222

tion, yet several avenues warrant further exploration to deepen our understanding of its effects. First, while this study focused solely on ACUE's year-long course, investigating the efficacy of ACUE's microcredentials could provide valuable insights into their comparative impact on teaching effectiveness and student outcomes. Research examining large, independent samples could further elucidate these dynamics.

Additionally, the context of concurrent professional development offerings at institutions may influence the observed outcomes. Future research should investigate the relative impacts of ACUE certification versus other teaching-related professional development programs. Such studies could clarify whether improvements in student outcomes are attributable specifically to ACUE training or to broader professional development efforts.

Another consideration is the variability in measures and populations across studies. This study employed IDEA evaluations, which differ from those used in prior research. Examining ACUE's effects across diverse institutions and utilizing varied assessment tools could offer a more comprehensive understanding of its impact. Future studies might benefit from comparing similar or contrasting instructor and student populations to identify factors contributing to differential outcomes.

In summary, while this study reinforces the positive effects of ACUE Courses, further research is needed to explore the nuances of ACUE's impact, including the effectiveness of its various components, comparisons with other professional development programs, and the role of institutional context. Such investigations could provide a more nuanced view of how ACUE and similar programs foster educational success.

## Conclusions

These findings suggest that the ACUE Course is associated with improved educational outcomes, including higher student evaluations of course quality and teaching excellence, as well as lower DFW rates. The significant differences observed after controlling for the number of students in the course highlight the potential benefits of ACUE Courses in enhancing the quality of education.

Overall, the results support the effectiveness of the ACUE Course in promoting better educational experiences and outcomes for students. They corroborate some of the claims made by ACUE itself, in studies funded by ACUE, and in studies published through peer review. While these studies all examined the ACUE Course or microcredentials. It is possible that other programs with similar goals, structures and time requirements could yield similar results. Future research should continue to explore the mechanisms through which ACUE Courses and other programs achieve these positive effects and investigate their long-term impact on student success. Of particular interest would be studies that helped to isolate factors that particularly contributory to these positive outcomes. Is it the content of the ACUE Course? Its structure? The accountability built into it? Its time-frame? Inquiring minds want to know.

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Table 9  
**ANCOVA Summary Table for ACUE Intro Courses**

Source		Type III SS	df	MS	F	p	$\eta_p^2$
Corrected Model	IDEA	3.734	2	1.867	6.904	0.001	0.030
	Teacher	6.693	2	3.347	9.911	0.000	0.043
	Course	3.898	2	1.949	5.258	0.006	0.023
	DFW	.156	2	0.078	2.085	0.125	0.009
Intercept	IDEA	2603.609	1	2603.609	9626.564	0.000	0.956
	Teacher	2857.646	1	2857.646	8462.658	0.000	0.950
	Course	2712.820	1	2712.820	7319.172	0.000	0.943
	DFW	8.292	1	8.292	221.923	0.000	0.335
Completed	IDEA	0.482	1	0.482	1.783	0.182	0.004
	Teacher	0.011	1	0.011	0.032	0.857	0.000
	Course	0.047	1	0.047	0.126	0.723	0.000
	DFW	0.002	1	0.002	0.040	0.841	0.000
ACUE	IDEA	3.420	1	3.420	12.645	0.000	0.028
	Teacher	6.607	1	6.607	19.567	0.000	0.042
	Course	3.892	1	3.892	10.502	0.001	0.023
	DFW	0.156	1	0.156	4.168	0.042	0.009
Error	IDEA	119.273	441	0.270			
	Teacher	148.916	441	0.338			
	Course	163.455	441	0.371			
	DFW	16.477	441	0.037			
Total	IDEA	7397.620	444				
	Teacher	8343.941	444				
	Course	7864.440	444				
	DFW	40.835	444				
Corrected Total	IDEA	123.008	443				
	Teacher	155.609	443				
	Course	167.352	443				
	DFW	16.633	443				

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