Impacts of Faculty Development on Faculty's Mindsets and Self-Efficacy: Summary of Findings from the ACUE Faculty Mindset Research Project

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This is an abbreviated reporting of findings from the ACUE Faculty Mindset Research Project. For full details on the study, please email research@acue.org to request the full technical report.

INTRODUCTION

College and university faculty are subject matter experts, yet many lack comprehensive pedagogical training. Given that their job responsibilities include the essential task of educating college students, the absence of comprehensive formal training in effective teaching practices may hinder their capacity to fully realize their potential as educators. This glaring disparity between their disciplinary mastery and their pedagogical preparation also raises pressing concerns about the overall quality of education provided to students, as research connects specific effective teaching practices to students' academic outcomes (e.g., Freeman et al., 2011). To bridge this gap and enhance instructional quality, faculty development programs have emerged, aiming to provide faculty with the necessary information and skills to become more effective educators.

Faculty development programs can differ in their approaches. Some programs merely share information, while others recognize that to effectively enhance learning opportunities, it is important to also address psychological barriers to learning. The reverse is also true: addressing psychological obstacles to learning will only be effective when accompanied by actual learning opportunities (Walton & Wilson, 2018; see also Bandura & Schunk, 1981; Menec et al., 1994). Consequently, *comprehensive* faculty development aims to positively shift educators' beliefs, particularly regarding their teaching abilities, their role as educators, and their students. This may be achieved by incorporating opportunities for practice and reflection to support growth in self-efficacy and mindsets.

Self-efficacy, defined as an individual's belief in their ability to organize and execute actions leading to positive outcomes (Bandura, 1977), plays a crucial role in education. Students' self-efficacy influences their academic performance, motivation, and achievement, while instructors' self-efficacy influences their teaching practices and student outcomes (Allinder, 1994; Bandura & Locke, 2003; Berman et al., 1977; Gore, 2006; Multon et al., 1991; Tschannen-Moran & Hoy, 2001; Woolfolk & Hoy, 1990).

Additionally, mindset theory refers to an individual's beliefs about the malleability of personal qualities, such as intelligence (Dweck, 1999, 2006; Dweck & Leggett, 1988). Individuals with a growth mindset believe that abilities can be developed through effort and learning, and those with a fixed mindset believe that abilities are inherent and cannot be significantly changed. Students with a growth mindset exhibit higher academic achievement, motivation, and engagement (Blackwell et al., 2007; Dar-Nimrod & Heine, 2006; Dweck, 2006). Instructors' mindsets significantly influence instructional practices and student outcomes, with a growth mindset associated with more effective

teaching practices, a growth-oriented learning environment, and better educational outcomes for students (Canning et al., 2019; Huang, 2023; Muenks et al., 2020).

This paper summarizes our findings from the ACUE Faculty Mindset Research Project, a study on comprehensive faculty development courses developed and offered by the Association of College and University Educators (ACUE) that lead to certification in the Effective Teaching Practice Framework and aim to positively shift faculty beliefs, specifically their self-efficacy and mindsets. The primary research questions from the study were:

1. How effective is comprehensive faculty development focused on effective teaching practices at improving faculty self-efficacy and mindset?
2. To what extent are students' self-efficacy and growth mindset influenced when faculty members engage in faculty development focused on effective teaching practices?

Data for the study was collected by ACUE's research team from early spring 2022 to the end of spring 2023. The process for selecting institutions to participate in the study considered factors such as geographic diversity, institution type, size, and whether schools were minority-serving institutions, and resulted in a sample of 10 U.S. colleges and universities.

Participating Schools

School	Location	Number of undergraduates	Minority-serving institution type(s)	Number of cohorts
California State University, Northridge	Northridge, CA	32,181	HSI	3
Cincinnati State Technical and Community College	Cincinnati, OH	8,404	n/a	1
CUNY Borough of Manhattan Community College	New York, NY	17,444	HSI	3
Cuyahoga Community College District	Cleveland, OH	15,764	n/a	1
Georgia Southern University	Statesboro, GA	21,979	n/a	3
Ivy Tech Community College	Indianapolis, IN	89,705	n/a	3
Lorain County Community College	Elyria, OH	9,170	n/a	1
North Carolina A&T State University	Greensboro, NC	11,833	HBCU	3
University of Hawai'i at Mānoa	Honolulu, HI	14,198	ANNH	3
University of Houston	Houston, TX	37,943	AANAPISI, HSI	3

AANAPISI = Asian American and Native American Pacific Islander Serving Institutions
ANNH = Alaska Native and Native Hawaiian Serving Institutions
HBCU = Historically Black Colleges and Universities
HIS = Hispanic Serving Institutions

Faculty members teaching gateway courses—foundational classes with high enrollment but also high rates of students receiving Ds, failing, or withdrawing (Koch, 2017)—at the 10 colleges and universities were then recruited to participate in ACUE's comprehensive faculty development courses. The study

focused on faculty of and students in gateway courses because they significantly influence student retention and completion, especially for those facing systemic barriers (Koch, 2017); successful completion of these major-related courses in the first semester increases college persistence (Flanders, 2017). Despite their importance, gateway courses have often been neglected in previous student success efforts (Koch, 2017). By focusing on faculty development as a student success initiative, the study aims to enhance the success of those teaching gateway courses, potentially benefiting a large number of at-risk students (Flanders, 2017; Koch & Drake, 2018).

A total of 571 faculty members engaged in the ACUE courses. Both ACUE faculty participants and a comparison group of 1,062 faculty members who taught gateway courses at the same institutions but did not enroll in ACUE courses participated in four waves of surveys, covering the period from the beginning of the ACUE course to one semester after the course ended. The surveys aimed to assess changes in faculty self-efficacy in employing effective teaching practices and in their mindsets related to their role as educators. These changes in faculty beliefs were assessed using linear multilevel models. Student surveys were also administered to students of ACUE faculty members, aimed at assessing students' academic self-efficacy and growth mindset.

ACUE'S COMPREHENSIVE FACULTY DEVELOPMENT COURSES

ACUE developed the Effective Teaching Practice Framework—a consensus statement of the teaching skills and knowledge that every college educator should possess to teach effectively, regardless of discipline (ACUE, 2016). The framework consists of 25 evidence-based teaching competencies[1] organized into five major units of study and has been independently validated and endorsed by the American Council on Education (ACE, 2017).

[1] A detailed description of all 25 competencies and their learning objectives can be found here.

ACUE offers comprehensive courses and a four-course pathway that both lead to the Effective Teaching Practice Framework Certification. ACUE's faculty development courses are offered asynchronously online in a cohort-based model, typically with approximately 25–30 faculty per cohort. Faculty typically engage in comprehensive courses over an entire academic year. ACUE's courses are designed to improve instructional practices, and consequently impact student outcomes, through six levels of sequential outcomes (MacCormack et al., 2018): (1) faculty engagement, (2) faculty learning, (3) faculty implementation, (4) student engagement, (5) course-level student outcomes, and (6) institutional outcomes.

Each module in ACUE's courses includes the same components organized into five sections:

1. Engage: The introduction or opening questionnaire and learning objectives are designed to engage faculty, set clear learning goals, and activate prior knowledge.

2. Listen, Watch, and Learn: Course Demonstration videos show faculty effectively using the module practices in authentic learning environments, while Expert Insights videos/podcasts explain what the practices are and the rationale behind them. Implementation resources provide additional details on how to implement the practices, with all these components building foundational knowledge.

3. Deepen Thinking: Faculty deepen their understanding through application by reading about common challenges and misconceptions; observing developing practice, either through a video or document, where some module practices are implemented effectively while others need some adjustment; and then participating in discussions with the peers in their cohort about what they observed in response to prompts.

4. Practice and Reflect: Faculty choose at least one practice to implement and write a reflection detailing why they chose the practice(s); how they implemented the practice(s); what impact they observed on their students, if any; and how they might refine their practice in the future. They then respond to a short survey to capture their learning and implementation.

5. Closing Strong: Faculty solidify their learning by writing a "note to self," which they can easily access at the end of their course, and can take additional steps in their learning by delving into the references that informed the development of the module.

ACUE's learning design promotes improved self-efficacy and changes in mindset through various strategies. Notably, course demonstration videos serve a dual purpose: they instruct faculty on how to implement the effective teaching practices outlined in each module, and they present real-life examples of how other faculty successfully implement the practices, providing faculty participants with vicarious experiences of social models. The choice to feature other faculty, rather than experts, creates exposure to successful peers, which should boost faculty members' confidence in adopting these practices themselves by establishing a stronger sense of similarity and relatability, leading to a greater impact on self-efficacy (Bandura, 1994). In addition to learning, faculty go through a cycle of implementing evidence-based teaching practices, observing the positive student response, and reflecting on student impact. This process provides faculty with opportunities to gain mastery experiences, which, if they are successful, should significantly influence self-efficacy (Bandura, 1994). Even when faculty initially perceive their implementation of a practice as unsuccessful, the reflection assignment includes a "next steps" section that prompts them to consider what changes they could make to improve their implementation for better success in the future.

The expectation that faculty implement a practice in every module encourages faculty to try new practices, even if they do not yet believe that changing their teaching will impact their students' engagement or performance. Then, the requirement to reflect specifically on how students responded prompts faculty to reconsider their beliefs about the impact of their teaching on students and students' ability to improve, which should result in improved mindsets. Furthermore, the repetition of this process through every module creates a recursive self-enhancing cycle (Walton & Wilson, 2018) that can be initiated by the change in behavior (i.e., implementation of the recommended practices).

The current study builds upon prior research demonstrating significant improvements in faculty's self-efficacy and beliefs after earning the Effective Teaching Practice Framework Certification (Lawner et al., 2020), as well as multiple findings that certified faculty and those on the pathway to certification positively impact student achievement (e.g., Hecht, 2019; Lawner et al., 2021), including in gateway courses (Pippins et al., 2021a, 2021b). This study focuses on mindsets and self-efficacy among faculty who teach gateway courses and begins to address student mindsets and self-efficacy to better understand how self-efficacy and mindsets contribute to the relationship between comprehensive faculty development and improved student outcomes.

IMPACT ON FACULTY BELIEFS

Data and Methodology

The ACUE Faculty Mindset Research Project included a faculty sample of 1,633 unique faculty who taught gateway courses across the 10 participating institutions. Out of the total sample, 571 faculty engaged in the ACUE comprehensive courses (henceforth, "ACUE participants"), while 1,062 faculty served as the comparison group.

A 30-item Faculty Self-Efficacy scale measured faculty levels of self-efficacy in using various effective teaching practices, with three subscales: Effective Teaching Practices, Adjusting Instruction, and Clarity in Instruction. All the items used a 5-point Likert scale ranging from *strongly disagree* to *strongly agree*. Similarly, an 18-item Faculty Mindset scale measured faculty's attitudes and beliefs related to their role as educators, with five subscales: Perceived Teaching Effectiveness, Impact of Instruction on Students, Growth Mindset, Teaching Improvement Behaviors, and Teaching Enthusiasm. All items used a 5-point Likert scale ranging from *not at all* to *extremely*.

We used a linear multilevel (or mixed effects) model (Harville, 1977; Laird & Ware, 1982; see also Singer & Willett, 2003) within a longitudinal analytic framework to examine how faculty self-efficacy and mindsets about their students' capabilities and potential evolved throughout the ACUE course. We restricted our sample to ACUE faculty only, capturing how the mindsets and self-efficacy of individual faculty changed across four time points: spring 2022 (prior to participating in the ACUE course), summer 2022 (midway through the ACUE course), fall 2022 (at the end of the ACUE course), and spring 2023 (one semester after the end of the ACUE course).

The core assumption of the model was that faculty mindsets and beliefs would have remained relatively stable in the absence of the ACUE course and that no other concurrent events affected these outcomes. This was a plausible assumption given the relatively short timeframe in which surveys were administered. The assumption was tested using faculty survey data from the comparison group in a robustness test.

Self-Efficacy

Results from the multilevel model revealed significant improvements in Faculty Self-Efficacy over time (*p*'s < .001). Figure 1 displays the trend in average Faculty Self-Efficacy ratings based on the multilevel model. Notably, the magnitude of the effect observed at the endpoint was relatively larger compared to the midpoint and follow-up, indicating a more substantial impact on Faculty Self-Efficacy.

Figure 1

Changes in Overall Faculty Self-Efficacy Ratings

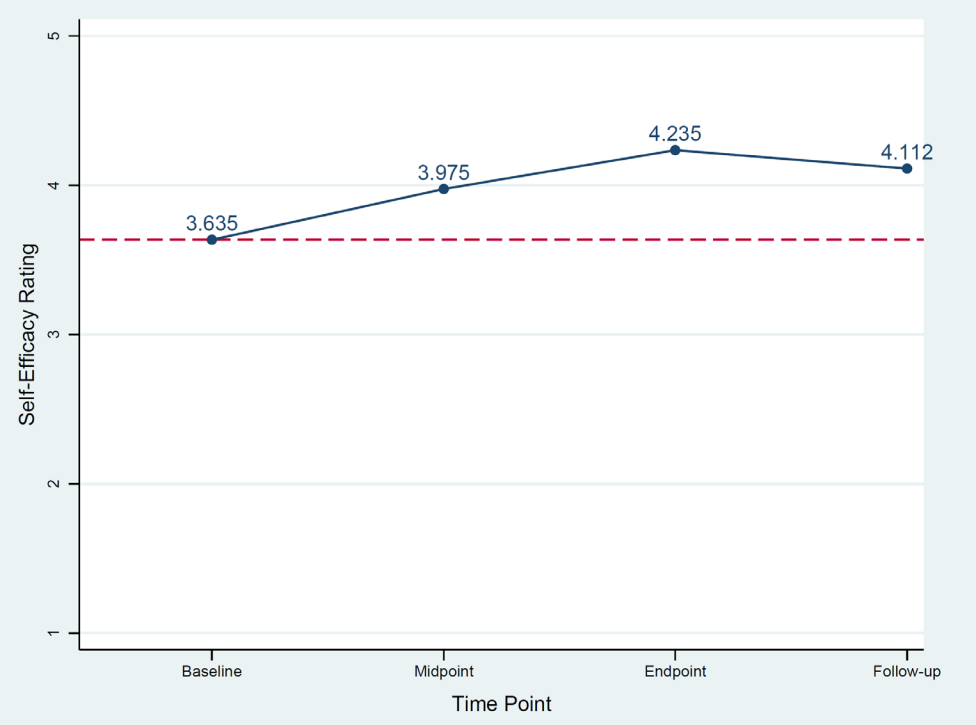
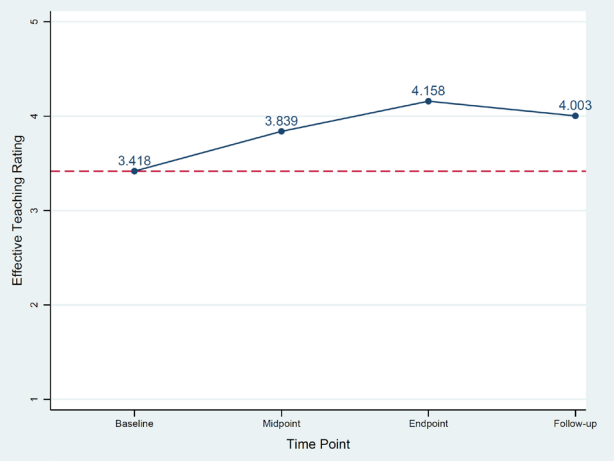


Figure 2, panels A–C display the trends in average ratings on the three Faculty Self-Efficacy subscales: Clarity in Instruction, Effective Teaching Practices, and Adjusting Instruction. Across all self-efficacy subscales, there were consistent increases in faculty ratings relative to baseline averages (*p*'s < .001). Effective Teaching Practices showed the largest increases at each time point relative to baseline.

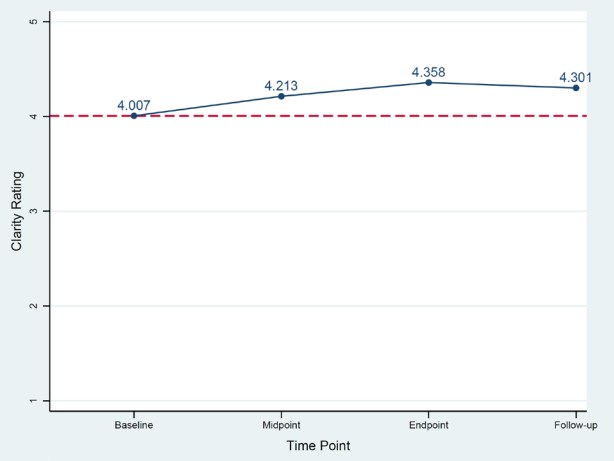
Figure 2

Changes in Faculty Self-Efficacy Subscale Ratings

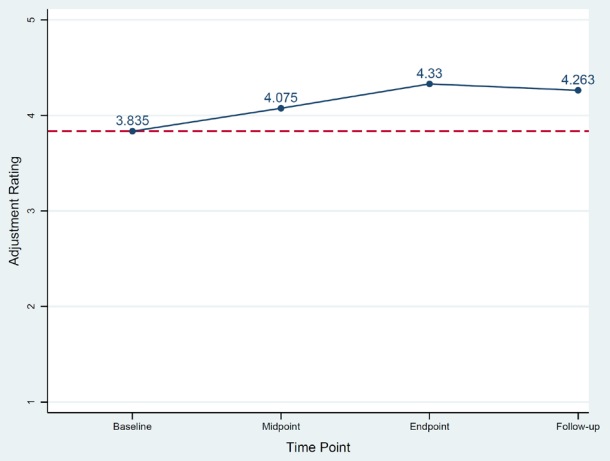
A. Effective Teaching Practices



B. Clarity in Instruction



C. Adjusting Instruction



For faculty teaching gateway courses, the findings from the linear multilevel model highlight the effectiveness of comprehensive faculty development in promoting positive shifts in faculty self-efficacy and mindsets. The examination of the Faculty Self-Efficacy scale revealed consistent improvements across all time points, with Cohen's d effect sizes ranging from medium (d = 0.61 at midpoint) to very large (d = 1.21 at endpoint). This means that the course had an important positive impact on faculty members' self-efficacy.

Furthermore, analyses of subscales showed improvements across all dimensions of Faculty Self-Efficacy—Effective Teaching Practices, Adjusting Instruction, and Clarity in Instruction—with a particularly strong impact on faculty's self-efficacy in implementing effective teaching practices. In other words, faculty became more confident in their ability to implement effective, evidence-based teaching practices in the classroom or online, including engaging and motivating students, facilitating discussions, and integrating active learning into their lessons. They also became more self-assured in their ability to adjust their instruction considering student understanding, achievements, and feedback. Likewise, they enhanced their confidence in their ability to provide clear explanations and directions to their students. The positive effect observed at follow-up indicates the potential long-term benefits of the course in promoting self-efficacy among faculty members.

Mindset

Results from the multilevel model revealed significant improvements in Faculty Mindset ratings over time (*p*'s < .001). Figure 3 displays the trend in average Faculty Mindset ratings based on the multilevel model. The similarity in magnitude of effect at the endpoint and follow-up suggests that the ACUE course had a sustained and stable effect on mindset over time.

Figure 3

Changes in Overall Faculty Mindsets

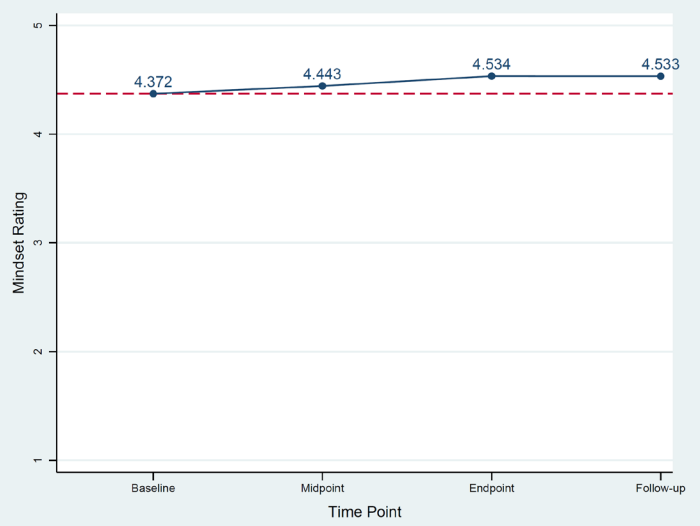
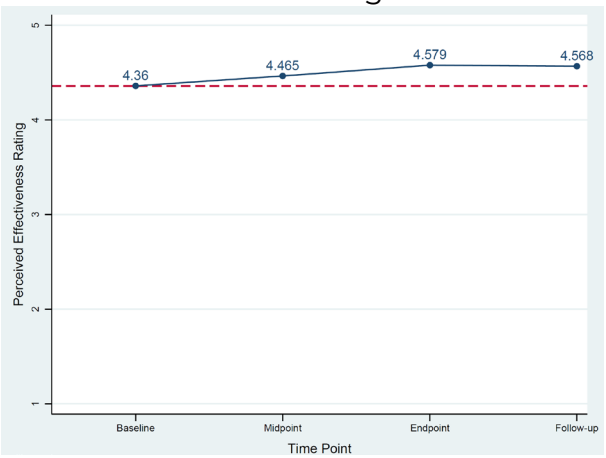


Figure 4, panels A–E display the trends in average ratings on the five Faculty Mindset subscales: Perceived Teaching Effectiveness, Impact of Instruction on Students, Growth Mindset, Teaching Improvement Behaviors, and Teaching Enthusiasm. From baseline to midpoint, there were statistically significant improvements (*p*'s < .001) in Perceived Teaching Effectiveness, Teaching Improvement Behaviors, and Enthusiasm. From the baseline to the endpoint, there was a significant increase in all mindset subscale ratings, except for Growth Mindset. Finally, from the baseline to the follow-up, there was a significant increase in all subscale ratings (*p*'s < .05). Teaching Improvement Behaviors demonstrated the largest increases across all time points.

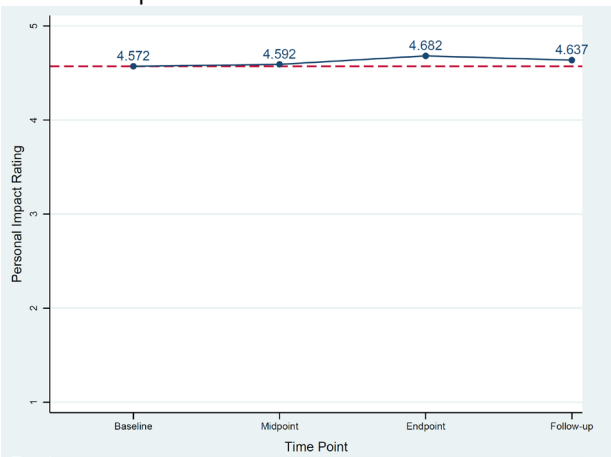
Figure 4

Changes in Faculty Mindset Subscales

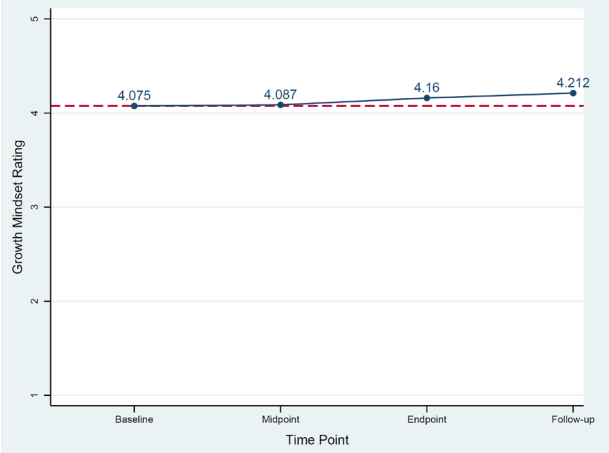
A. Perceived Teaching Effectiveness



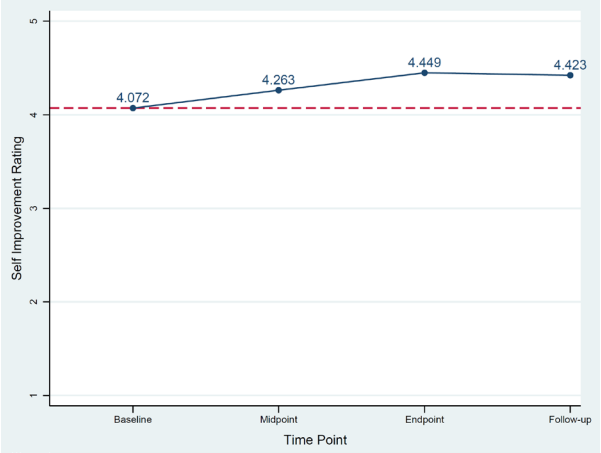
B. Impact of Instruction on Students



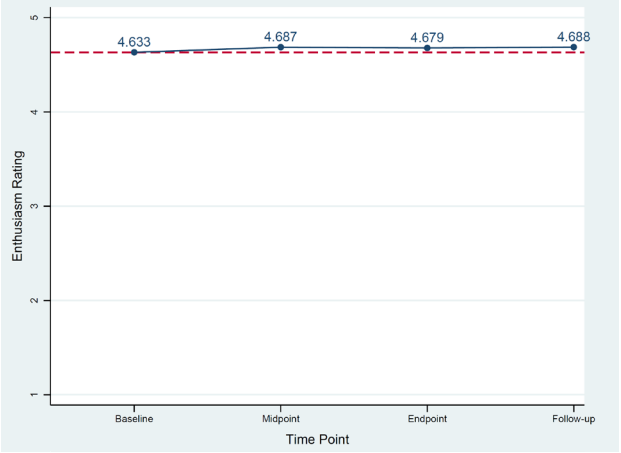
C. Growth Mindset



D. Teaching Improvement Behaviors



E. Teaching Enthusiasm



The results suggest the ACUE course led to significant improvements in faculty mindsets. There was a sustained and stable effect on average Faculty Mindset ratings over time, with Cohen's d effect sizes ranging from small (d = 0.22 at midpoint) to medium (d = 0.51 at endpoint). This indicates that comprehensive faculty development had a noticeable positive influence on faculty's mindsets. The positive increases in all Faculty Mindset subscales—Perceived Teaching Effectiveness, Impact of Instruction on Students, Growth Mindset, Teaching Improvement Behaviors, and Teaching Enthusiasm—particularly in the follow-up period, indicate a holistic transformation in faculty perceptions and attitudes towards students, teaching, and learning. The overall improvements observed across all dimensions of mindsets indicate that the course had a positive and sustained influence on faculty members' perception of their teaching effectiveness, awareness of the influence their teaching has on students' learning, growth mindset, adoption of teaching improvement behaviors, and their enthusiasm for teaching.

Use of Comparison Group Data

To examine our assumption that faculty self-efficacy and mindsets would have remained relatively stable over time and unaffected by any changes in circumstances while the study was taking place, we employed a differences-in-differences (DID) approach to compare changes over time between ACUE faculty and a group of faculty members who taught gateway courses but did not participate in the ACUE course (comparison faculty). We did not use this method as our main approach because of changes in the composition of the comparison sample, which could lead to biased results. The results for self-efficacy, mindset, and each of their subscales were largely similar to our main results, supporting the primary hypothesis that comprehensive faculty development is associated with improvements in faculty's mindsets and self-efficacy. The negligible differences in the estimates between the primary model and the DID specification further strengthened the reliability of the findings.

POTENTIAL IMPACT ON STUDENT BELIEFS

Data and Methodology

The ACUE Faculty Mindset Research project included a student sample comprised 2,977 students enrolled in gateway courses taught by ACUE faculty across the colleges and universities that participated in the study. Valid survey responses were obtained from 1,017 students at the end of the spring 2022 semester and from 1,960 students at the end of the fall 2022 semester.

The Academic Self-Efficacy scale (adapted from The College System of Tennessee, n.d.) assessed students' confidence in their abilities to perform various academic tasks, with two subscales—Communication and Self-Monitoring. Participants were asked to rate their confidence level with each of the behaviors presented on a 5-point Likert scale, ranging from 1 (*not at all confident*) to 5 (*extremely confident*).

The Growth Mindset scale measured students' beliefs about their intelligence and their potential for growth and change using three items from the most-used scale to measure growth mindset designed by Dweck (1999). Participants indicated their level of agreement with each statement on a 5-point Likert scale, ranging from 1 (*strongly disagree*) to 5 (*strongly agree*), which was reverse coded so higher scores reflected higher growth mindset.

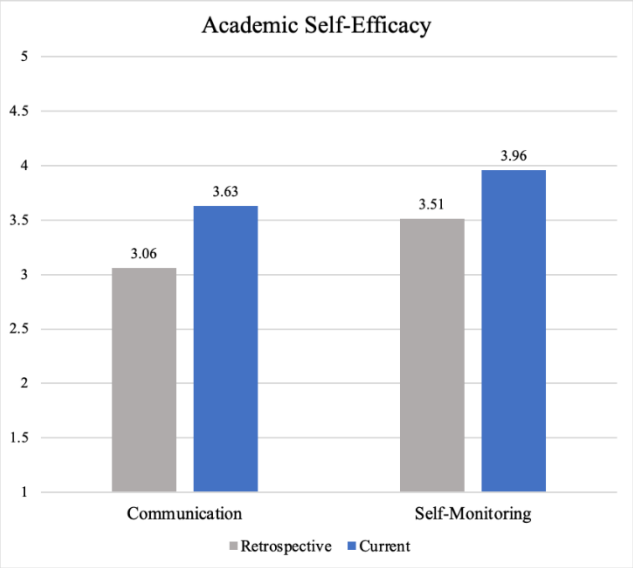
Both scales consisted of two sets of statements, each including the same items. In the first set of items, students were asked to respond according to their beliefs at the start of the semester (retrospective items) and, in the second set, they were asked to respond according to their beliefs at the time of taking the survey (current items).

Academic Self-Efficacy

As illustrated in Figure 5, students reported that they had greater self-efficacy in their Communication and Self-Monitoring at the end of the semester than they did at the beginning of the semester (*p*'s < .001).

Figure 5

Perceived Increase in Students' Academic Self-Efficacy

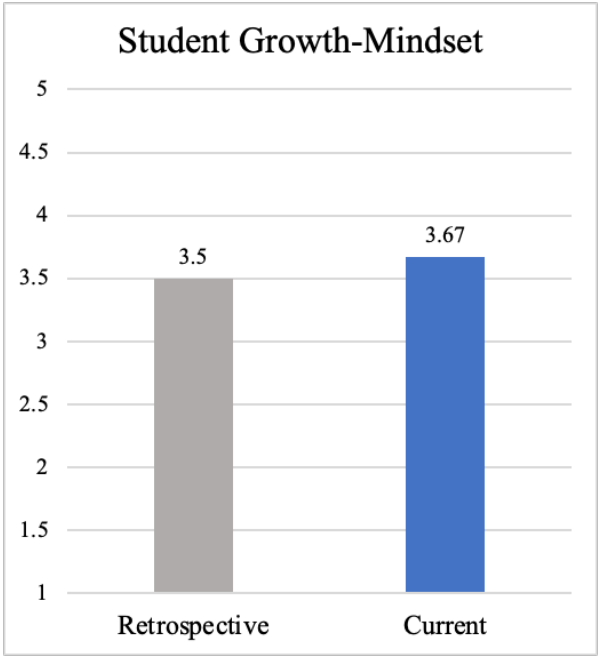


Growth Mindset

As shown in Figure 6, students reported that they had greater growth mindset at the end of the semester than they did at the beginning of the semester (*p* < .001).

Figure 6

Perceived Increase in Students' Growth Mindset



Analysis of the student survey demonstrated that students across both semesters perceived a significant increase in their growth mindset and academic self-efficacy from the start of the semester to the end of the semester. Since only students of ACUE faculty completed the student survey, we cannot compare these changes to those otherwise occurring in students enrolled in gateway courses at these institutions. However, the retrospective pre/post results on students' self-efficacy and growth mindset do suggest that ACUE faculty may have positively influenced their students' mindsets.

CONCLUSION

The findings of this study support the effectiveness of comprehensive faculty development, involving implementation of effective teaching practices and reflection on that implementation, in enhancing faculty self-efficacy and mindsets and provide preliminary evidence of positive impacts on student academic self-efficacy and growth mindset as well. Given the research linking students' self-efficacy and growth mindset to their achievement (e.g., Gore, 2006; Multon et al., 1991; Robins & Pals, 2002), we would expect the changes in faculty and student self-efficacy and mindsets to be followed by improvements in students' course performance. Furthermore, the significant effects one semester after the end of the ACUE course, particularly on faculty mindsets, demonstrates the sustained impact of comprehensive faculty development and the potential for faculty certified in the Effective Teaching Practice Framework to impact students for semesters to come. The trends in faculty self-efficacy and mindsets over time also support the notion that comprehensive faculty development can simultaneously impact faculty mindsets and improve use of effective teaching practices, rather than faculty mindset changes being a prerequisite for successfully engaging in faculty development.

While the current study focused specifically on ACUE's Effective Teaching Practice Framework Certification, the findings may apply to faculty development more broadly, so long as faculty development programs are comprehensive, include a focus on growth mindset, and use a learning design that supports changes in self-efficacy and mindset, such as through expectations to implement recommended practices and reflect on the student impact and areas for refinement. As such, these results contribute to the existing literature on faculty development, underscoring the importance of targeted faculty development initiatives in promoting effective teaching practices and fostering a growth-oriented mindset among faculty members.

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