

**Examining if the NSF INCLUDES Aspire Alliance Teaching Practicum Improved
Community College STEM Teaching Among Underrepresented Graduate Mentees**

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Introduction

Improving academic program diversity and inclusion in higher education training programs can be accomplished by preparing and retaining underrepresented groups ([UR] ethnic minorities, women, people from low-income backgrounds, and those with disabilities) for faculty teaching positions (Chaparro et al., 2022). Consequently, several strategies exist to increase the number of teachers from UR in STEM fields (e.g., Chaparro et al., 2022). A mentored teaching practicum is one way to help teachers succeed and advance in their careers (Crawford & Smith, 2005). Correspondingly, exposing UR graduate students to various career paths and opportunities available in community colleges (CC) and universities can help achieve the United States' goal of increasing the representation of UR in higher education (Crawford & Smith, 2005; Thomas et al., 2007). The NSF INCLUDES Aspire Alliance Regional Change Team (RC) works within regional collaborative partnerships (one in Iowa, two in Texas, two in California, and one in Florida, and three new ones in Ohio, Massachusetts, and Wisconsin) to recruit and prepare UR graduate students for STEM faculty positions through two-year-mentored CC teaching practicum (Aspire Alliance, n.d.). The goal is to expose and attract more UR graduates to CC STEM faculty positions.

Conceptual Framework

This study followed Bandura's (1997) social cognitive theory of self-efficacy and Patton's (2010) developmental, formative, and summative evaluation approaches to determine the program's impact, including self-efficacy development. The study quantitatively examined the impact of the CC-mentored teaching practicum on UR graduate mentees' CC teaching outcomes, including confidence, skill application, and efficacy development.

Methods

The study sample ($N = 102$) comprised PhD ($n = 37$) and master's ($n = 39$) graduate students purposively recruited from four collaborative regions, including Iowa ($n = 21$), West Texas ($n = 34$), North/East Texas ($n = 16$) and Southern California ($n = 44$) following their participation in the Aspire RC teaching practicum. Some participants ($n = 39$) did not indicate their graduate-degree level. The survey design guided the examination of the cumulative impact of Aspire mentored teaching practicum on the graduate mentees' CC teaching outcomes. Four cohorts of respondents were surveyed retrospectively via Qualtrics between 2019 to 2022. The survey had two pre-post questions on career confidence, each measured on a six-point scale (1 = not at all confident to 6 = extremely confident). The second set of questions examined the impact levels of seven CC teaching efficacy sources on a six-point scale (1 = a little impactful to 6 = extremely impactful). The third question contained one item measuring mentees' likelihood to apply learned skills in future practice measured categorically on a six-point scale (1 = not at all, 2 = a little, 3 = somewhat, 4 = moderately, 5 = very, and 6 = extremely confident). Paired sample *t*-Test, means scores, Chi-square goodness of fit, and profile plots were conducted. The study sample comprised whites ($n = 20$), Black African/ American ($n = 10$), Hispanics ($n = 23$), and other races grouped, including Asian/ Asian Americans, Pacific Islanders, I prefer not to respond, and Global citizen ($n = 22$). The rest ($n = 40$) did not identify with any race.

Results

RO1 examined the effect of the RC mentored teaching practicum on mentees' career confidence. Data presented as mean, standard deviation with an alpha level of .05, a two-tailed paired samples *t*-test was significant, $t(18) = 8.41, p < .001$, indicating that the mean difference (2.14 ± 1.44) between mentees' confidence to teach in a CC before (3.03 ± 1.32) and after ($5.18 \pm .94$) teaching practicum was significantly different from zero. Similarly, paired samples *t*-test was significant, $t(18) = 8.41, p < .001$ for making a career decision, indicating that the mean difference (1.31 ± 1.09) between mentees' confidence to make CC faculty career decisions before (3.71 ± 1.23) and after ($5.02 \pm .94$) teaching practicum was significantly greater than zero. The mean differences were positive for the two career items, indicating that the Aspire teaching practicum and mentorship enhanced mentees' CC career decisions and teaching confidence.

RO2 described the impact levels of the sources of CC teaching efficacy. Data presented as means and standard deviations—the sources of teaching efficacy with the highest rating of five and above were observing at least one class of a mentor's teaching (5.30 ± 1.12), using at least one observation form during a classroom visit (5.20 ± 1.33), and supporting a mentor's classroom management needs (5.04 ± 1.45). The next highest included reviewing a mentor's course syllabus as an exemplar (4.90 ± 1.45), using at least one observation form during a classroom visit (4.73 ± 1.72), and supporting a mentor's classroom management needs (4.64 ± 1.65) while the least rated was observing other teachers in a CC teaching (3.77 ± 2.47).

RO3 examined the likelihood that the UR graduate mentees would apply teaching skills after the teaching practicum. The Chi-square goodness of fit test was significant at an alpha value of .05, $\chi^2(4) = 104.33, p < .001$, indicating significant differences in the likelihood that mentees will use mentoring skills in the future. Over 80% of the participants reported they were extremely ($n = 54$) or very ($n = 23$) likely to apply the skills in the future. A few participants ($n = 10$) also reported they were moderately likely to use the skills in the future, while only one reported they were not at all likely to do so.

Conclusions and Recommendations

The results were a subset of data collected from four regional collaboratives collected after the fact between 2019 and 2022. A complete analysis, including data from the class of 2023, will be completed and presented at future conferences. The results showed that mentees' confidence in CC teaching and career-related decisions improved. Furthermore, all mentorship efficacy sources were perceived to contribute to the UR graduate mentees' CC teaching efficacy significantly. Finally, over 80% of mentees said they were very likely or highly likely to use their mentoring skills in the future. The positive attributions of the Aspire teaching practicum on mentees indicate that increasing the diversity of the UR in agricultural education/ communication programs can be achieved through a well-thought-out, intentional recruitment and mentoring of UR graduate students for STEM faculty positions. Future evaluation research should involve more participants from UR in each prospective cohort and determine the role of mentorship relations in the process.

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