Science, Technology, Engineering, and Mathematics (STEM) fields are increasingly important to U.S. economic growth and competitiveness (United States Department of Labor, 2007). Retention in STEM remains a persistent problem.

One way to enhance retention in STEM is for students to develop an identification with their field while in college (Hunter et al., 2007). In the workforce, engagement in professional development (PD) is linked with professional identification, career success and retention (Maurer et al., 2008).

By applying Social Cognitive Career Theory (SCCT), we developed a model of antecedents and outcomes associated with PD among computer science and engineering majors.

SCCT Model:
- Emphasizes personal agency in career development, while recognizing importance of individual differences and environmental influences.
- Extensive empirical support (e.g., Lent et al., 2001, 2003, 2005; Noe & Wilk, 1993).

Antecedents:
- SCCT model recognizes that intentions to engage in PD are the most immediate precursor to PD actions.
- Antecedents of intentions include self-efficacy, outcome expectations, supports, and barriers.

Outcomes: Persistence intentions, major involvement, affective commitment, and continuance commitment.

Method

198 computer science or engineering students recruited during fall semester from two universities who received course credit or cash payment ($20/survey). Completed two online surveys, one at recruitment and another at end of semester.

Mean age = 20.44 (SD = 4.28), and the majority were male (96.3%) engineering majors (67.3%). Of those reporting ethnicity, 43.7% were White, 34.7% were Black, 5.5% were Hispanic, 5.5% were Asian, and 8.5% were of another race.

Survey 1: PD self-efficacy and PD intentions (Mauer et al., 2003); outcome expectations, support, and barriers (Lent et al., 2003; Noe & Wilk, 1993).

Survey 2: PD actions (Mauer et al., 2003); persistence intentions; major involvement (Kanungo, 1982); and affective and continuance commitment (Wessel et al., 2008).

Results

Used EQS 6.1 to test fully latent structural equation model. Chi-square, CFI, SRMR, and RMSEA were used to assess model fit.

Initially hypothesized model yielded reasonable fit, $\chi^2 (970) = 1534.87, p < .001$, CFI = .90, SRMR = .08, RMSEA = .06.

After examining modification indices, changes made to improve fit & non-normality: dropped non-significant paths between (1) continuance commitment & major involvement (2) continuance commitment & affective commitment and (3) PD self-efficacy and PD intentions

Final Model: $\chi^2 (972) = 1540.75, p < .001$, CFI = .94, SRMR = .09, RMSEA = .06.

Robust statistics: mean and variance adjusted $\chi^2 (48) = 63.63$, n.s., CFI = .98, RMSEA = .04.

Discussion

Major findings of SCCT model of undergraduate PD:
1. Extended workplace literature to the undergraduate context, demonstrating that students’ engagement in PD is a viable way to anchor students to STEM majors.
2. Supported role of both individual differences and environmental factors in intentions to engage in PD.

3. Failure to support direct effects of PD self-efficacy and barriers is likely due to suppression, as suggested by follow-up analyses that were conducted.

Future research should investigate how perceptions of supports and barriers influence trends in professional development over the course of a student’s academic career.