Academic Confidence Mediates Informal Socialization and Professional Identity of STEM Doctoral Students in the United States

PNW-COSMOS SSRG[1]
Que N. Tran; Carrie B. Myers; Scott M. Myers; Catherine M. Johnson

BACKGROUND

Central to doctoral students' success is their interactions with advisors, faculty, and others (Curtin, Malley, & Stewart, 2016). Tao and Gloria (2019) suggested STEM departments develop early opportunities for research collaborations and foster an early sense of accomplishment that would lead to students' persistence. Graduate students who are successfully socialized to the profession, department, and academic rigor are more likely to complete their degree (Gardner & Gopaul, 2012; Pifer & Baker, 2016).

Professional identity-building happens more readily when socialization activities align with pivotal times. Ruud et al. (2018) found that graduate students' academic and social interactions with faculty contributed to students' professional preparation and career choice. This finding is important as career preparation occurs through professional identity development.

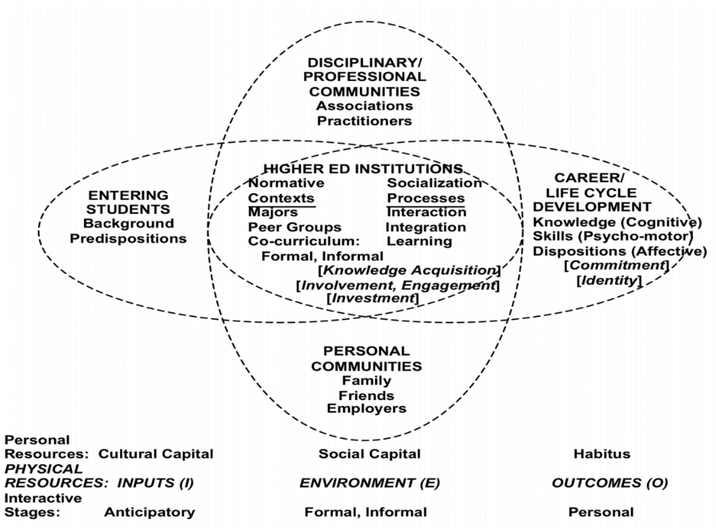
Doctoral students' career choice is "influenced by active interactions with various individual and environmental factors" such as faculty, peers, advisor, external career support outside departments (Seo, Ahn, Huang, Makela, & Yeo, 2020). Those interactions support doctoral students embracing diversified career opportunities either academic or beyond academic careers (Hancock & Walsh, 2016; Heflinger & Doykos, 2016), professional identity development (E. George, Saclarides, & Lubienski, 2018), and career aspirations (Gibbs Jr & Griffin, 2013).

Research Question

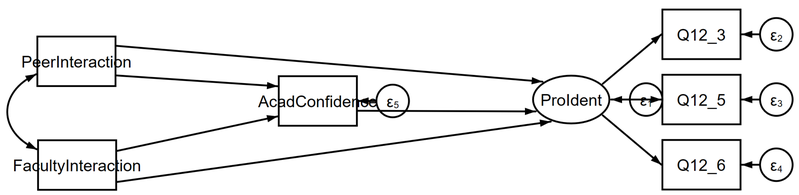
RQ1. To what extent do STEM doctoral students' academic confidence affect by peer and faculty interactions?
RQ2. Does Academic Confidence mediate socialization and Professional Identity among STEM doctoral students?

Theoretical Framework

Henkel's (2002, 2009) framework on professional identity and Weidman-Twale-Stein's model of graduate student socialization (2001) guide this investigation of doctoral students' informal interactions with faculty and peer and if these can predict students' perceptions of professional identity and STEM fields.



Conceptual Model



METHOD

Quantitative path analysis.

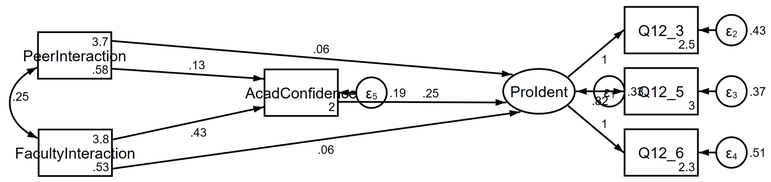
Constructs

- ✓ Peer interactions (Cronbach alpha = .88)
- ✓ Faculty interactions (Cronbach alpha .91)
- ✓ Academic confidence (Cronbach's alpha: .85)
- ✓ Professional identity (Cronbach's alpha: .76)

Data:

- ✓ Sample n = 2,126 (out of 4,012 respondents in master & PhD programs), collected in the academic year 2015/16 at 13 institutions

RESULTS



$\chi 2(6) = 39.01$; CFI = 0.99; TLI = 0.97; RMSEA = 0.05; SRMR =.02, AIC = 26647.45/ BIC = 26766.35. R2 = .42.

- ✓ The higher peer and faculty interactions, the more likely STEM doctoral students have academic confidence.
- ✓ The more academic confidence students hold, the more professional identity they are.
- ✓ Academic confidence mediates part of the relationship between peer, faculty interactions and professional identity

REFERENCES (selected)

- Gardner, S. K., & Gopaul, B. (2012). The part-time doctoral student experience. *International Journal of Doctoral Studies*, *7*(12), 63-78.
- Pifer, M. J., & Baker, V. L. (2016). Stage-based challenges and strategies for support in doctoral education: A practical guide for students, faculty members, and program administrators. *International Journal of Doctoral Studies*, *11*(1), 15-34.
- Seo, G., Ahn, J., Huang, W. H., Makela, J. P., & Yeo, H. T. (2020). Pursuing careers inside or outside academia? Factors associated with doctoral students' career decision making. *Journal of Career Development*, 0894845320907968.
- Tao, K. W., & Gloria, A. M. (2019). Should I stay or should I go? The role of impostorism in STEM persistence. *Psychology of Women Quarterly*, *43*(2), 151-164.
- Weidman, J. C., & DeAngelo, L. (Eds.). (2020). *Socialization in higher education and the early career: Theory, research and application* (Vol. 7). Springer Nature.

The primary sponsor for PNW-COSMOS is the National Science Foundation (NSF), Directorate for Education and Human Resources (EHR), Division of Human Resource Development (HRD). The project is supported by: Collaborative Research: The Pacific Northwest Alliance to develop, implement and study a STEM Graduate Education Model for American Indians and Native Alaskans. This is an AGEP-T: Alliance for Graduate Education and the Professoriate-Transformation under HRD grants #1432932 (Washington State University), #1432910 (University of Idaho), #1432694 (University of Montana), and #1431773 (Montana State University). Any opinions, findings, and conclusions or recommendations expressed in this material are those of the author(s) and do not necessarily reflect the views of the National Science Foundation.