Am I a STEM Professional? 
Self-Authorship and Student Professional Identity Development

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Abstract
Development of professional identity is a critical juncture. To explore STEM student professional identity development we assessed STEM students using a lens of self-authorship. Our results indicate that several proxy questions may be useful for assessing STEM student professional identity development and their engagement in learning partnership activities.

Methods
Research Questions:
- How can we assess undergraduate STEM students levels of professional identity?
- How effective are items focused on learning and academic interactions for assessing level of professional identity?
- What are the levels of professional identity development of undergraduate STEM students?

Participants
- 194 completed surveys
- Average age of 25.31 years (SD = 7.86)
- 34% female and 66% male
- 14.3% freshman, 21.4% sophomores, 32.3% juniors, and 30.5% seniors and 1.5% graduate students
- Average of 3.23 years of college (SD = 1.6)
- 64% engineering majors, 17% biology, 6% math, and 13% physical and geological sciences
- 30% had engaged in service learning, 24% in an internship, and 55% in paid work experiences
- 37% were involved in clubs related to their major or minor, 25% had engaged in related research

Instrument
We developed a 27-item survey to capture levels of students’ professional identity development, which included items to assess:
- Preferences for learning
- Engagement in extracurricular activities
- Justification for pursuing a STEM career
- Description of professional interaction – e.g. communication with faculty members.

Results
- Misalignment between perceptions of level of professional development and professional behaviors indicating students may overestimate their levels of professional identity
- Students perceptions of themselves as STEM professionals was correlated with their comfort with talking with faculty (r = .24, p < .01), years of college education (r = .15, p < .05).
- Student perceptions of themselves as STEM professionals correlated (r = .16, p < .05) with why they are STEM major (coded using SA framework)
- Marginally non-significant correlation with description of how they interact with STEM faculty
- Level of professional identity associated with preference for learning (F = 1.93, p < .05) shifting to more interactive forms of learning such as classroom discussion.

Discussion
- Students perceive they have more advanced professional development than their professional behaviors indicate.
- Our research indicates ways in which students interact with STEM faculty and engagement in professional activities (e.g. research) are associated with level of professional identity.
- This finding suggests that students who have more advanced professional identity are likely to be more comfortable with engaging in STEM learning conditions that involve situations of ambiguity and contribution to learning.
- With experience student reasons for being a STEM major shifted from more external references (financial reward) to more internal references (making a difference, enjoyment), suggesting that as professional identity become more developed, students internalize the reasons for being a STEM professional, as predicted by self-authorship.

Ongoing Research
- Developing a method for rapidly assessing the Learning Partnership Model
- Examining level of professional identity development and engagement in an REU
- Examining professional identity development and role as a Learning Assistant
- Examining course structure, preferences for a course, goal orientation, and success with learning