



EXPANDING STEM TALENT
through Upward Transfer



Does Active Learning Contribute to Transfer Intent Among Community Colleges Students Beginning in STEM?

Xueli Wang, Ning Sun, Seo Young Lee, & Brit Wagner
University of Wisconsin-Madison

*Presentation at Council for the Study of Community Colleges
58th Annual Meeting
Plano, Texas*

<http://stemtransfer.wceruw.org>

Funded by the National Science Foundation (Award No. DUE-1430642)





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Introduction and Research Focus

- Explore whether and how active learning contributes to transfer intent among first-year community college students beginning in STEM.
- Active learning: pedagogical approaches that “truly engage students intellectually and involves thinking, problem-solving, questioning, or analyzing information” (PCAST, 2012, p. 86).

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Background Literature

- **Prior research on active learning**
 - Promotes positive cognitive, motivational, and educational outcomes (e.g., Armbruster et al., 2009; Cherney, 2008; Watson et al., 1996), but research concentrating on 4-year.
- **Prior research on transfer intent**
 - Most important precursor to actual transfer → must understand what cultivates transfer intent (e.g., Rosenbaum, 2001), but only limited research (e.g., Laanan, 2003; Wang, 2013)
- **Potential linkage between active learning and transfer intent**
 - Active learning's academic, motivational, and social “benefits” are plausible contributors to transfer intent
 - May foster transfer intent by cultivating transfer self-efficacy



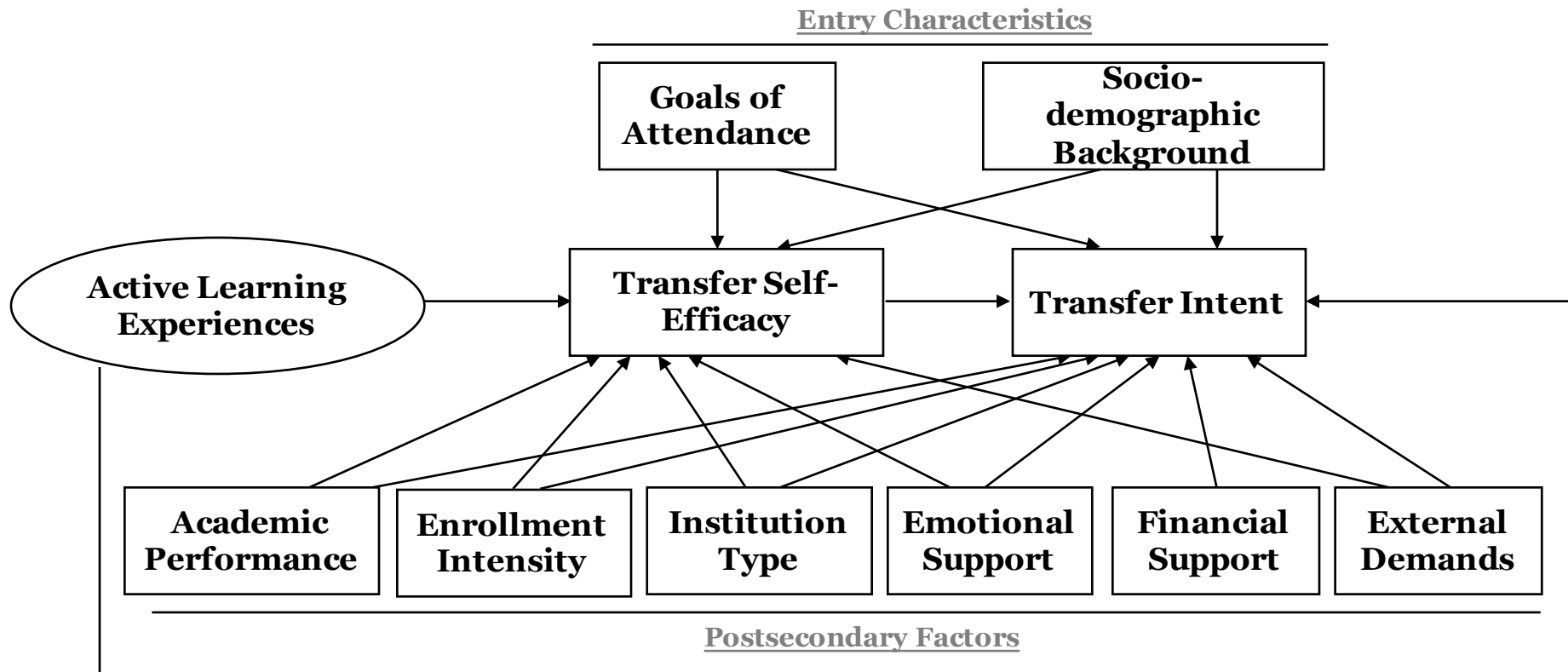


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Conceptual Framework

Social cognitive career theory (SCCT; Lent et al., 1994) and higher education literature



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Data and Sample

- Part of a longitudinal (2014-2018), mixed methods study seeking to examine what influences student transfer in STEM fields, supported by the NSF (DUE-1430642)
- Research sites including all public 2-year colleges/campuses with *upward transfer* as part of their institutional missions, located in a Midwestern state
- Target study sample drawn using two strata : race/ethnicity and STEM fields, and includes a cohort of roughly 3,000 first-year students beginning in STEM programs or courses
- Survey data: Expanding STEM Talent Survey (Wang, 2015)
- Final study sample size: 1,668 (for a response rate of 56.6%)
- Combined survey data with administrative data/transcript records

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Analytical Approaches

- Key dependent variable: transfer intent
 - measured by a multi-categorical variable: (1) intent to transfer into a STEM field, (2) intent to transfer into a non-STEM field, and (3) no transfer intent (reference category)
- Key independent variable: active learning experiences
 - measured by 15 survey items. Example items include
 - *Apply what have learned to real-life situation*
 - *Present what have learned to instructor or peers*
 - *Explore key concepts, data, beliefs, or values within small group*
 - *Think and discuss questions before instructor gives answer*

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Analytical Approaches

- Mediating variable: Transfer self-efficacy
 - measured by respondent's self-reported confidence about their ability to handle the process and requirements for transferring to a 4-year college or university.
- Control variables include student's entry characteristics and postsecondary factors.
- Used path analysis of mediation as the main analytical strategy

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Results

	<i>b</i>	S.E.	<i>p</i>	Delta P
Transfer self-efficacy ('DV')				
Active learning ('IV')	0.195***	0.042	0.000	
Intent to transfer to STEM majors vs. no transfer intent ('DV')				
Active learning ('IV')	0.313*	0.134	0.019	0.036
Transfer self-efficacy ('IV')	0.445***	0.088	0.000	0.053
Intent to transfer to non-STEM majors vs. no transfer intent ('DV')				
Active learning ('IV')	-0.064	0.146	0.664	
Transfer self-efficacy ('IV')	0.506***	0.099	0.000	0.096

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Discussion

- Active learning as a promising approach to remedy the leaky STEM pathways
- Broadening transfer access among community college students by boosting their transfer self-efficacy and cultivating aspirations to transfer
- Broadening community college students' pathways and options

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Implications for Policy and Practice

- Contextualize curriculum: recognizing the value of and engaging instructors' industry background
- Active learning should become a regular component of the discourse in community college teaching and curriculum development

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Direction for Future Research

- Inclusion of other variables related to transfer self-efficacy or transfer intent in the model
- In-depth interviews and classroom observations to capture more nuanced aspects of active learning in and outside of classroom

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Thank you! For more information, check out our Expanding STEM Talent study

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