Testing the combined effect of learning space and faculty perceptions of self-efficacy to use student-centered practices on teaching experiences and student engagement

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21st Century Students

- Students need to develop:
  - innovation
  - information and media technology
  - life and career
  - global awareness
  - financial literacy
  - problem solving
  - communication
  - creative thinking
  - collaboration skills

(Brandt, 2010; Pearlman, 2010)
Student Centered Practices

- Learning is enabled through strong social relationships and collaboration with fellow students and their instructor, and problem based, hands on learning

- Use of student-centered practices predict:
  - Improved:
    - test scores
    - attendance
    - attitudes
    - engagement and connectedness to others
    - ownership over education
  - Reduced failure rates

(Armbruster, Patel, Johnson, & Weiss, 2009; Beichner, 2007; Brooks, 2011; Brooks et al., 2014; Freeman, 2014; Hains & Smith, 2012; Hunley & Schaller, 2009; Weiman, 2014)
Learning Spaces

- Traditional Learning Spaces
  - Fixed desks
  - Student attention forward
  - Instructor movement is restricted
  - Use and access to technology is prohibitive

- Active Learning Spaces
  - Reconfigurable tables and chairs
  - Instructor movement is enabled
  - Internet connectivity, power outlet access, and ample workspace

(Beichner, 2007; Brooks, 2014; Hannafin & Land, 1997; Petersen, 2014; Uduku, 2015)
Active Learning Spaces

The use of active learning spaces is associated with:

- Improved
  - test scores
  - grade point averages
  - engagement
  - conceptual understanding
  - enriching experiences
- Reduction in failure rates

The concurrent use of student-centered practices in active learning spaces yield the greatest benefit for students

Social Cognitive Theory

- Self-efficacy: the belief that one can successfully execute the behavior required to produce a certain outcome
  - Self-efficacy is dependent on situation specific factors including time, place and task
- Faculty self-efficacy for student-centered practices
Mixed findings on the benefits of and how faculty behave in active learning spaces

Social cognitive theory indicates that behavior and feelings of efficacy are context dependent

Self-efficacy to use student-centered practices have not been examined across active learning and traditional learning spaces
Purpose

- Examine faculty perceptions of self-efficacy to use student-centered practices in active and traditional learning spaces
Test the degree to which self-efficacy predicts:
- faculty perceptions of their self-efficacy for student-centered interactions, engaged student behaviors, satisfaction with their teaching, and use of student-centered practices.
Hypotheses

**ACTIVE LEARNING SPACES**

- Self-efficacy for student-centered practices
  
  +

  Perceptions of:
  - Teaching
  - Student Experiences

**TRADITIONAL LEARNING SPACES**

- Self-efficacy for student-centered practices
  
  +

  Perceptions of:
  - Teaching
  - Student Experiences
Hypotheses

Self-efficacy for student-centered practices

Perceptions of:
Teaching
Student Experiences

Self-efficacy for student-centered practices

Perceptions of:
Teaching
Student Experiences
Method

Participants

148 faculty who taught in an active learning space during the previous two academic years

Teaching experience:

- 6% teaching less than 2 years
- 6% teaching 3 to 5 years
- 20% teaching 5 to 10 years
- 68% teaching more than 10 years

39% ($n = 57$) completed IMPACT training
Measures

- Self-efficacy for student-centered practices
  - Active learning spaces (11 items; $\alpha = .89$)
  - Traditional learning spaces (11 items; $\alpha = .87$)

EXEMPLARY ITEM

- Self-efficacy for student-centered interactions
  - Active learning spaces (5 items; $\alpha = .90$)
  - Traditional learning spaces (5 items; $\alpha = .89$)

EXEMPLARY ITEM
Measures

- Satisfaction with teaching
  - Active learning spaces (2 items; $\alpha = .67$)
  - Traditional learning spaces (2 items; $\alpha = .70$)

- Engaged student behaviors
  - Active learning spaces (3 items; $\alpha = .73$)
  - Traditional learning spaces (3 items; $\alpha = .89$)

- Descriptive
  - Years teaching and participation in IMPACT
Data analysis

- Preliminary analysis
  - Data screening
  - Means and standard deviations
  - Correlations
  - Cronbach’s Alphas
  - Confirmatory factor analysis

- Main analysis
  - Structural equation modeling
Results of Preliminary Analysis

Trends of significant correlations within learning spaces and across learning spaces

<table>
<thead>
<tr>
<th>Variable</th>
<th>Within traditional spaces</th>
<th>Across learning spaces</th>
<th>Within active learning spaces</th>
</tr>
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<tbody>
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<td>Parallel variable</td>
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<td>Self-efficacy</td>
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<td>Student-centered interactions</td>
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<td>Teaching satisfaction</td>
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<td>Technology use satisfaction</td>
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<td>Student engagement behavior</td>
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<td>Peer engagement</td>
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<td>Student preparation</td>
<td>+</td>
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<td>Use of student centered practices</td>
<td>-</td>
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</table>

Note: + = positive correlation; - = negative correlation; n.s. = non-significant correlation; n/a = not applicable.
Results

Significant paths ($p < .05$) represented by solid lines and non-significant paths represented by dashed lines. $R^2 = \text{variance explained.}$ RMSEA = .05 (90% CI = .04 -.06, CFI = .23) CFI = .93; TLI = .91.
Significant paths ($p < .05$) represented by solid lines and non-significant paths represented by dashed lines. RMSEA = .06 (90% CI = .05-.07, CFit = .06) CFI = .92; TLI = .89.
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Significant paths ($p < .05$) represented by solid lines and non-significant paths represented by dashed lines. TS = traditional spaces, ALS = active learning spaces, $R^2 = $ variance explained. RMSEA = .06 (90% CI = .05-.07, CFI = .15) CFI = .92; TLI = .90.
Significant paths ($p < .05$) represented by solid lines and non-significant paths represented by dashed lines. TS = traditional spaces, ALS = active learning spaces, $R^2$ = variance explained. RMSEA = .06 (90% CI = .05-.07, CFit = .15) CFI = .92; TLI = .90.
Discussion

- Space dependent self-efficacy
  - Cannot assume that perceptions of effective use of student-centered strategies are consistent across learning spaces
  - New training programs should provide strategies to use student-centered practices across learning spaces

- Faculty perceptions of space specific self-efficacy may serve as a mechanism in the effective use of learning spaces
  - New training programs should target and assess change in self-efficacy

- Active learning spaces facilitate the use of student-centered practices
  - Traditional learning spaces can be creatively modified to enable the use of student-centered practices
Discussion

- Faculty have learning-space preferences
  - Institutions can make efforts to better accommodate faculty needs through new space assignment policies

- Encourage and support faculty who are new to active-learning spaces
  - Experienced and effective teachers in traditional learning spaces may encounter challenges in active-learning spaces
Discussion

Future research

- Include instructor space specific self-efficacy as a:
  - Target of new trainings
  - Mechanism for the effective use of active-learning spaces
  - Indicator of faculty perspectives

- Improve room assignment policies
THANK YOU
### Table 2

**Descriptive statistics and correlations**

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**M**                                            | 4.44  | 4.84  | 4.09  | 5.01  | 3.72  | 3.22  | 3.72  | 5.67  | 5.77  | 5.42  | 5.46  | 5.35  | 5.75  | 4.30  | 6.02  |

**SD**                                           | .92   | 1.30  | 1.93  | 1.59  | 1.44  | 1.49  | 1.41  | .79   | 1.05  | 1.48  | 1.35  | 1.34  | 1.09  | 1.39  | 1.22  |

*Note: TS = traditional spaces, ALS = active learning spaces. All items were measured on scale from 1-7.*

*p < .05, **p < .01.