Transitioning to Math Emporium, the Impact on Student Motivation
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Math Emporium

• What is it?
  – The development of it
  – The transition at the target university
    • Facilities
    • Faculty
    • Courses

Motivation

• Theories of motivation
  – Self-efficacy (Bandura)
  – Expectancy task value (Eccles & Wigfield)

• Variables included
  – Self-efficacy
  – Ability beliefs
  – Value
  – Task Difficulty
  – Required Effort

Participants

• N = 856
  • Males = 218, Females = 390
  • Mean age = 19.4 years, range 18-46 years
  • 93% ethnically white
  • Math ACT subject score mean = 22.64
    – Standard deviation = 4.55

Participant Enrollment in Course by Semester

<table>
<thead>
<tr>
<th></th>
<th>Spring 2010</th>
<th>Fall 2010</th>
<th>Spring 2011</th>
</tr>
</thead>
<tbody>
<tr>
<td>Basic Algebra</td>
<td>17</td>
<td>43</td>
<td>23</td>
</tr>
<tr>
<td>Intermediate</td>
<td>105</td>
<td>100</td>
<td>39</td>
</tr>
<tr>
<td>College Algebra</td>
<td>172</td>
<td>309</td>
<td>48</td>
</tr>
</tbody>
</table>

Methodology

• Data Collection

  Scales
  • Self-efficacy: Patterns of Adaptive Learning Scales (Midgley et al., 2000)
    – 5 questions, 5 point Likert
  • Task Value and Expectancy (Eccles & Wigfield, 1995)
    – 3-7 questions on subscales, 7 point Likert
Motivation in Basic Algebra

<table>
<thead>
<tr>
<th>Sum of Squares</th>
<th>df</th>
<th>Mean Square</th>
<th>F</th>
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</thead>
<tbody>
<tr>
<td>Self-efficacy</td>
<td>Between</td>
<td>7.54</td>
<td>2</td>
</tr>
<tr>
<td>Within</td>
<td>91.08</td>
<td>80</td>
<td>1.14</td>
</tr>
<tr>
<td>Total</td>
<td>98.62</td>
<td>82</td>
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<tr>
<td>Ability beliefs</td>
<td>Between</td>
<td>18.43</td>
<td>2</td>
</tr>
<tr>
<td>Within</td>
<td>144.6</td>
<td>80</td>
<td>1.81</td>
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<tr>
<td>Total</td>
<td>163.03</td>
<td>82</td>
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</tr>
<tr>
<td>Value</td>
<td>Between</td>
<td>8.34</td>
<td>2</td>
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<tr>
<td>Within</td>
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<td>1.24</td>
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<tr>
<td>Total</td>
<td>107.64</td>
<td>82</td>
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Motivation in Intermediate Algebra

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<tbody>
<tr>
<td>Self-efficacy</td>
<td>Between</td>
<td>6.45</td>
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<td>Within</td>
<td>181.28</td>
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Motivation in College Algebra

<table>
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</thead>
<tbody>
<tr>
<td>Task difficulty</td>
<td>Between</td>
<td>30.57</td>
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<tr>
<td>Within</td>
<td>1434.85</td>
<td>526</td>
<td>2.73</td>
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<tr>
<td>Total</td>
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<tr>
<td>Required effort</td>
<td>Between</td>
<td>23.65</td>
<td>2</td>
</tr>
<tr>
<td>Within</td>
<td>1406.44</td>
<td>526</td>
<td>2.67</td>
</tr>
<tr>
<td>Total</td>
<td>1430.09</td>
<td>528</td>
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Conclusions

- No significant changes in motivation of students before and after the transition to math emporium format for Intermediate and College Algebra.
- Three variables (self-efficacy, ability beliefs, & value) changed for Basic Algebra students following course redesign.
Limitations & Future Research

- Collect data a few years after the transition
- Limited participation
  - Encourage students to participate
  - Encourage students to share grades

References


Pajares, F., & Miller, M. D. (1994). In the mark of the iron. The structure of achievement task values and expectancy-values in high school. *Journal of Educational Psychology*, 87(4), 617-623.


Pintrich, P. R., & DeGroot, E. V. (1990). In the mark of the iron. The structure of achievement task values and expectancy-values in high school. *Journal of Educational Psychology*, 87(4), 617-623.

