Active Learning: Obstacles to implementation and sustainability

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Transforming Post-Secondary Education in Mathematics

2 August 2016
Post-secondary education in mathematics will enable any student, regardless of his or her chosen program of study, to develop the mathematical knowledge and skills necessary for productive engagement in society and in the workplace.

We believe that a collective effort by the mathematical sciences community will be required to achieve that vision.
Narrow the gap between today’s mathematics and the mathematics students study in college.

Make each mathematics departments essential partners in improving quantitative education in all disciplines.

Ensure that post-secondary mathematics education gives all students a platform for success (toward college completion and achieving aspirations).
Some surprising statistics

- How much more likely are women than men to choose not to continue beyond Calc 1, even when Calc 2 is required for their major?
- What % of bachelor’s degrees in math are earned by women?
- What % of PhDs in math+stats are earned by women?
- What % of postdocs in math went to women?
- What % of tenured faculty in doctoral math departments are women?
- What % in top 50 research departments?
Some surprising statistics

- How much more likely are women than men to choose not to continue beyond Calc 1, even when Calc 2 is required for their major? About twice as likely.
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Some surprising statistics

- How much more likely are women than men to choose not to continue beyond Calc 1, even when Calc 2 is required for their major? *about twice as likely*

- What % of bachelor’s degrees in math are earned by women? *41%

- What % of PhDs in math+stats are earned by women?

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- What % in top 50 research departments?
Some surprising statistics

- How much more likely are women than men to choose not to continue beyond Calc 1, even when Calc 2 is required for their major? *about twice as likely*
- What % of bachelor’s degrees in math are earned by women? 41%
- What % of PhDs in math+stats are earned by women? 32%
- What % of postdocs in math went to women?
- What % of tenured faculty in doctoral math departments are women?
- What % in top 50 research departments?
Some surprising statistics

- How much more likely are women than men to choose not to continue beyond Calc 1, even when Calc 2 is required for their major? **about twice as likely**
- What % of bachelor’s degrees in math are earned by women? 41%
- What % of PhDs in math+stats are earned by women? 32%
- What % of postdocs in math went to women? 25%
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- What % of bachelor’s degrees in math are earned by women? *41%*
- What % of PhDs in math+stats are earned by women? *32%*
- What % of postdocs in math went to women? *25%*
- What % of tenured faculty in doctoral math departments are women? *14%*
- What % in top 50 research departments?
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- What % of PhDs in math+stats are earned by women? 32%
- What % of postdocs in math went to women? 25%
- What % of tenured faculty in doctoral math departments are women? 14%
- What % in top 50 research departments? 4%
Some surprising statistics

- What % of undergraduate students attend 2-year colleges?
- What % 4-year college students had enrolled in a 2-year college?
- What % of low-income students attend a 2-year college?
- What % of high-income students attend a 2-year college?
Some surprising statistics

- What % of undergraduate students attend 2-year colleges? 42%
- What % 4-year college students had enrolled in a 2-year college?
- What % of low-income students attend a 2-year college?
- What % of high-income students attend a 2-year college?
Some surprising statistics

- What % of undergraduate students attend 2-year colleges? 42%

- What % 4-year college students had enrolled in a 2-year college? 46%

- What % of low-income students attend a 2-year college?

- What % of high-income students attend a 2-year college?
Some surprising statistics

- What % of undergraduate students attend 2-year colleges? 42%
- What % 4-year college students had enrolled in a 2-year college? 46%
- What % of low-income students attend a 2-year college? 44%
- What % of high-income students attend a 2-year college?
Some surprising statistics

- What % of undergraduate students attend 2-year colleges? 42%
- What % 4-year college students had enrolled in a 2-year college? 46%
- What % of low-income students attend a 2-year college? 44%
- What % of high-income students attend a 2-year college? 15%
Some surprising statistics

- What % of students attending 2-year colleges take math courses that are not credit-bearing? > 60%
- What % of those never complete a math course? > 70%
Some surprising statistics

- What % of students attending 2-year colleges take math courses that are not credit-bearing? > 60%
- What % of those never complete a math course? > 70%

Over 40% of students who start at a 2-year college never finish simply due to the math barrier.
Coherent pathways (lower division)

*The challenge:* Disjointed pathways among institutions create barriers to college completion for an increasingly mobile student population.

Enhanced/Alternative pathways (upper division)

*The challenge:* The ever expanding use of mathematics in the workplace creates the need for new course offerings, developed in partnership with other disciplines, to better meet students’ academic and career goals.

New Teaching Strategies

*The challenge:* Economic pressures on students and institutions create the imperative for new instructional strategies to improve student success rates and deliver education cost effectively without sacrificing quality.

Graduate Education

*The challenge:* Disjointed pathways among institutions create barriers to college completion for an increasingly mobile student population.
TPSEMath Strategic Priorities

Coherent pathways (lower division)

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Enhanced / Alternative pathways (upper division)

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New Teaching Strategies

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Graduate Education

The challenge: Disjointed pathways among institutions create barriers to college completion for an increasingly mobile student population.
TPSEMath Key Activities

- Regional meetings
- Strategic planning
- Inaugural MAG meeting
- Organizational set-up
- Chairs+1 Meeting – 6-8 October 2016
Growth versus Fixed Mindset

- Can mathematical success be achieved through hard work, or only with innate talent?

- “Smart” label can reinforce fixed mindset.

- Factor by which a white public school students is more likely than a black student to be labeled “gifted”?

Harper's Index, May 2016.
Growth versus Fixed Mindset

- Can mathematical success be achieved through hard work, or only with innate talent?

- “Smart” label can reinforce fixed mindset.

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Growth versus Fixed Mindset

- Can good teaching be achieved through hard work, or only with innate talent?
- “Smart” label can reinforce fixed mindset.
- Factor by which a white public school students is more likely than a black student to be labeled “gifted”? 2.4

Harper's Index, May 2016.
Looking forward

- Efficient sharing of materials and resources
- Public relations
- Connections with the policy world
- Cultural shift in value placed on teaching
Let’s work together .....

Thank you!!

http://www.tpsemath.org/

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Send me a postcard!