Adaptive Student-Driven Paths Through Developmental Mathematics

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Summary

• Learn about mathematics placement redesign at the University of New England which provides students with a multitude of options rather than a single high-stakes test. Pre-test review, independent bridge, and traditional classroom opportunities are all accessible to students as they progress from developmental through college-level mathematics.

Student Academic Success Center, Division of Student Affairs. Non-academic department. Administrative Faculty contract.
About UNE

• Four year private university.
• 600 – 650 first year students.
• Regardless of major, all students are required to take statistics and biology.
• 80% are admitted to a science or health science major.
• Science and health science majors require statistics, precalculus, calculus I and/or calculus II; biology, chemistry, and/or physics.
Concerns

• Remediation causes students to fall behind in their program. Minimum mathematics levels exist for all science courses. The lowest level math placement does not allow students to enroll in any college level math course nor any science courses. Students placing at the developmental level who are in math and science ‘heavy’ majors are immediately behind in their program.

• Students are unrealistic & lack ‘good student skills’. Students were/are often surprised by the depth of study and the rapid pace of college level math and science courses and are unrealistic about their own abilities.

• Marginally prepared students. Some students who achieve a college level mathematics placement are considered marginal and struggled with precalculus and chemistry.

• Retention. Retention rates for developmental placers was/is unacceptable.
Mathematics Placement Before Redesign

Single high stakes test:
• Administered to all students at June orientation
• Considered in combination with Math SAT, and high school math courses and grades.
• High school GPA and intended major also considered.
• First semester schedule is determined by mathematics placement and revealed to student during advising session on day 3 of orientation.
• 20% of all students place at the developmental level. UL2 and UL3.
• Required to enroll in one or two developmental level courses.
• 10% of students are considered marginal UL4 placers.
The Big Reveal!

About 20% of first year students (120-140) are required to enroll in one or perhaps two Developmental Mathematics courses.
Philosophical Shift –
There are many paths to graduation.

• Placement as a process
• Series of opportunities
• Student driven
Priorities in Math Placement Redesign

• Place students in an appropriate math class.

• Provide opportunities to complete developmental level coursework prior to arriving on campus.

• Address concerns about marginal placers.
Math Placement: Non-Testers and Testers

• Automatic placement into college level coursework for qualified students: Math SAT $\geq 550$; ACT $\geq 23$ (about 50% of incoming students).

• Remaining students are required to sit for a mathematics placement exam which is considered in combination with Math SAT; high school math courses and grades; and intended major.
So what’s new?


• Preplacement Bridge Opportunity (New in 2015).

• Post Placement Precalculus Bridge Opportunity (non-developmental) (New in 2015).
Marketing Placement & Bridge

- **Website** for prospective and accepted students.
  [http://www.une.edu/studentlife/biddeford/sasc/math-writing-placement](http://www.une.edu/studentlife/biddeford/sasc/math-writing-placement)

**New Student Orientation**

Start your life as a Nor’easter!

You will:

- Meet with your academic advisor from your department and register for classes.
- Experience the beautiful, ocean-front campus.
- Meet with the Office of Multicultural and Diversity Services and learn about cultural diversity and staff.
- Meet with the Office of Disability Support Services team and learn about accommodations.
- Meet with other incoming UNB students to socialize.

**Additional Info**

- Placement Testing
- Summer FAQs
- What to Bring
- Leader Program
- Medical Forms
Presence at Accepted Students day. Promotional materials distributed.
Social Media

Facebook, blogs, twitter.
Institutionalization

• Admissions staff
• Orientation staff
• Professional and Faculty advisors
• Postcard sent home.

**Mathematics Placement at UNE**
**Prepare for Success!**

- UNE’s placement process begins with a review of your Math SAT score and high school curriculum and grades.
- If your Math SAT is less than 550 (ACT 23), you **will** be required to sit for the Accuplacer test during new student orientation.
- For some students with a Math SAT of 550 or higher, the Accuplacer test may be recommended.
- You are encouraged to become informed about mathematics placement and consider a mathematics review. Sample questions are available at [https://accuplacer.collegeboard.org/students](https://accuplacer.collegeboard.org/students)

**For more information about math placement and how you can prepare**

*Enrollment in math & sciences courses depends on your math placement level!*

If you have questions concerning math placement, please contact Lori Wall by e-mail at lwall@une.edu or by phone at 207-602-2443
Bridge Invitation & Promotion

• Bridge invitations distributed to individual students at advising.

• Reminder mailing sent two weeks after orientation.

An Invitation to participate in Summer Bridge Opportunity
Your fall schedule depends on it!
Importance of the Nudge!

• 2014 cohort: Ninety-fours students were invited to UL3 Bridge. 35 students enrolled. Additional 34 students enrolled after a letter was sent to their home.

• 2015: Weekly emails sent through the course to each participant providing encouragement and information.

Did we address the concerns?

Provided many opportunities for students to get and stay on track with their program and graduate in four years. Including those who change majors from a soft science to a hard science.

- Summer Bridge
- Winter Bridge for continuing students
- Summer Bridge for continuing students
- Preplacement Bridge
- Bridge to Calculus
Accelerate students through developmental coursework and enrolled in their college level math and science courses as soon as possible.

About 50% of UL2 placers finish Bridge. 15 students

About 45 - 55% of UL3 placers finish Bridge. 40 – 60 students
Ensure that marginal placers have an opportunity to prepare for the rigors of college coursework before arriving on campus.
**Bonus:** Reduced number of Developmental Course sections from 10 per year to 5 per year.

**Bonus:** Allowed us more time to support students in Statistics and Precalculus.
<table>
<thead>
<tr>
<th>Participated in Bridge - 2013</th>
<th>UL2</th>
<th>UL3</th>
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</thead>
<tbody>
<tr>
<td>71.1% (14 students &amp; 45 courses)</td>
<td>88.5% (41 students &amp; 116 courses)</td>
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<thead>
<tr>
<th>Did not participate in Bridge - 2013</th>
<th>UL2</th>
<th>UL3</th>
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<tbody>
<tr>
<td>72.7% (14 students &amp; 22 courses)</td>
<td>67.5% (48 students &amp; 83 courses)</td>
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For UL2 placers, 71.4% (10 of 14) Bridge students were enrolled in 'hard' science majors as compared to 35.7% (5 of 14) non-bridge students.

For UL3 placers, 87.8% (36 of 41) Bridge students were enrolled in 'hard' science majors as compared to 60.9% (28 of 46) non-bridge students.

- **Student success in math and science coursework.**

88.5%
## Retention Rates for Bridge Participants and Non-Participants

<table>
<thead>
<tr>
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<th>Two &amp; Three Year Retention Rate for UL2 Placers</th>
<th>Two &amp; Three Year Retention Rate for UL3 Placers</th>
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</thead>
<tbody>
<tr>
<td>Participated in Bridge 2012 or 2013</td>
<td>53.3%</td>
<td>63.2%</td>
</tr>
<tr>
<td>Did not participate in Bridge 2012 or 2013</td>
<td>51.7%</td>
<td>53.8%</td>
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Two year retention rate for UL2 & UL3 placers 2006 - 2011

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<td>43.9%</td>
<td>55.5%</td>
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Improved retention rates for underprepared students.
Student Satisfaction

• Choices
• Flexibility
• Second chance
• Confidence
• Success
Going Forward....

Developmental course redesign

- One developmental level, two courses. One for soft-science and one for hard-science.

- Math placement ‘tweaks’. Further reduce the number of students required to sit for a math placement exam perhaps by a Transcript Evaluation model.