Progress through the Basic Skills Sequence

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Introduction

Success in college level course work depends on a certain level of literacy and numeracy. Incoming students, however, are often unprepared for college level courses. This report presents a compilation recent data that examines the basic skills pipeline at Cabrillo College.

A student centric view

Course success is possibly the most frequently examined measure at the college. Course success represents the outcomes from one classroom from one semester. Therefore, course success speaks to curriculum and to teaching. Student success, on the other hand, ought to take a longer view. Students may fail or withdraw in any single semester, and may repeat. A more interesting measure looks at what happens to individual students over several semesters.

A longitudinal study looks at individual students’ progress over time. Usually, individual students are grouped into cohorts according to their start-year. Then, in order to be able to compare different cohorts with different start-years, a time window must be imposed. For example, outcomes are examined after three years for all cohorts\(^1\). This way, it becomes possible to compare the outcomes from various cohorts, even though they have different start-years. It also means that all cohorts must be allowed time to reach the endpoint of the time window.

Methodology

For this study, cohorts were assembled around the year of a student’s first math or English class\(^2\) and around the level of that course. Cohorts were thus assembled from enrollment records. Next, the members of these cohorts were ‘followed’ for three years, with each subsequent enrollment in English or math examined and tracked.

Student Assessment/Placement records were also incorporated into the study. These records include equivalency credit for prerequisite courses taken at another institution. Thus, in combination with the

\(^1\) Most individual student activity in the sequence is concluded within three years, either through completion, or by stopping out at one of the levels along the way.

\(^2\) To establish first-time-in-subject, enrollment records were examined back to fall 2000.
enrollment records, it becomes possible to ascertain how a student became eligible for enrollment in a particular course.

The cohorts examined in this study are data cohorts, formed for research convenience. For the most part, students from the several entry-cohorts did not attend together. The average classroom will consist of students who are at one point or another in their journey through the sequence.

Students entering the sequence from the lowest level may do so without undergoing assessment testing; these students may therefore be regarded has having self-assessed. But from the next level forward, enrollment is controlled, and restricted to students meeting the prerequisite – either by the assessment, an equivalency from another institution, or by way of promotion, having passed the prerequisite course.

Enrollment in an average classroom for courses in the sequence may consist of students who are in one of four categories:

- the student qualifies via assessment/placement
- the student qualifies by way of an equivalency
- the student passed the prerequisite course
- the student is repeating the course

Figure 2a (English) and Figure 2b (math) illustrate the mix of Students that might be expected in the average section English and math basic skill sequence courses. Data are from 2007-08 through 2010-11.

**Attrition points**

The length or number of levels in a sequence has implications for longitudinal attrition. There are two opportunities for attrition at each level. Attrition obviously occurs when students (after possibly multiple attempts) do not satisfactorily pass a course. The second opportunity for attrition involves abstention, procrastination, or possible difficulty in enrolling in the next course in the sequence. Many students who are otherwise eligible for the next course in the sequence will stop out.

Some amount of attrition is inevitable, even natural. The effects of attrition multiply with the number of opportunities. Imagine, for

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3 Sections set aside for Learning Communities are a possible exception
example, a program where 80% of the cohort move forward at each attrition opportunity - a very successful program! After three levels (and six opportunities for attrition), only about one quarter of the original cohort would remain. The chart below illustrates how, even with an extremely enviable rate of progress to the next level, the throughput is small.

<table>
<thead>
<tr>
<th>Continuation Rate</th>
<th>Result</th>
</tr>
</thead>
<tbody>
<tr>
<td>80%</td>
<td>100 students in the entry cohort</td>
</tr>
<tr>
<td>80%</td>
<td>80 pass level 1, eligible to move ahead</td>
</tr>
<tr>
<td>80%</td>
<td>64 enroll level 2</td>
</tr>
<tr>
<td>80%</td>
<td>51 pass level 2, eligible to move ahead</td>
</tr>
<tr>
<td>80%</td>
<td>41 enroll level 3</td>
</tr>
<tr>
<td>80%</td>
<td>33 pass level 3</td>
</tr>
<tr>
<td></td>
<td>26 enroll in College level</td>
</tr>
</tbody>
</table>

Figure 1a (English) and Figure 1b (math) show the actual attrition rates for Cabrillo College entry-cohorts in math and English. Students are grouped according to the level of their first course in the sequence and by year of entry. These data are averages from the four cohorts from academic year 2004-05 through 2007-08.

**More detail on progress through the sequence**

Table 1a (English) and Table 1b (math) reveal much more detail regarding the entry-cohorts and their progress through the developmental sequence. The following questions are answerable from the detail datasets.

- How many students are entering at a particular level each academic year?
- How many [and what percent] of the entry-cohort successfully complete coursework at this level?
- On average, how many separate enrollments were observed at this level? In other words, what is the average number of repeats within this level?  

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4 In math, there may be two courses within one level. Students have the option of completing Essential Math in two semesters: one semester each of MATH-254A and MATH-254B. This study glosses over the distinction between repeats in MATH-254, and initial enrollments/repeats in MATH-254A/B. In other words, all enrollments within this level are counted as attempts. Further research might examine the efficacy of the MATH-254A/B pathway.
• How many [and what percent] of those who took courses in one level enroll in the next level in the sequence?

Following the progress of the cohort from the start-year at the left, and moving across, left to right, these questions can be answered at each level. The headcount numbers (highlighted columns) show the actual number of cohort members persisting at each level in the sequence.

For example, from Table 1b (Math), one might focus on the 2007-08 entry-cohort starting at 3 levels below transfer. The entry-cohort consists of 736 individuals. Of these, 61.3% (451) are successful after one or more enrollments at this level, and are eligible for the next course. However, only 44.6% (328) students attempt Elementary Algebra. The individual success rate in Elementary Algebra (after one or more attempts) for these students is 73.8%. Thus, 242 students successfully complete the course, and are eligible for Intermediate Algebra. However, only 145 continue in Intermediate Algebra, and so on. When it comes to transfer-level math, only 73 students from the original entry-cohort enroll. Thus, from the 2007-08 entry-court starting from three levels below, about one in ten enroll in transfer level math (within three years).

**Summary**

Student success in a course sequence is not just about what happens in the classroom, but is also about persisting to the next level. Sequenced courses ought to be examined sequentially, using longitudinal cohort analysis of student progress. Perhaps greater attention should be focused on the attrition opportunities between completion of one level and enrollment in the next.
Progress through the Basic Skills Sequence

Figure 1a

Students starting 2 levels below transfer: [ENGL-255] Basic English

<table>
<thead>
<tr>
<th>Passed Basic English</th>
<th>Enrolled Elements of Writing</th>
<th>Passed Elements of Writing</th>
<th>Enrolled Transfer level English</th>
</tr>
</thead>
<tbody>
<tr>
<td>74%</td>
<td>55%</td>
<td>45%</td>
<td>29%</td>
</tr>
</tbody>
</table>

Starting from 100%, the percent of the entry cohort remaining is shown at each attrition opportunity.

Data cohorts are from 2004-05 through 2007-08. Outcomes are examined after three years.
Figure 1b

Students starting 3 levels below transfer: [MATH-254] Essential Math

Starting from 100%, the percent of the entry cohort remaining is shown at each attrition opportunity.

Data cohorts are from 2004-05 through 2007-08. Outcomes are examined after three years.
### Table 1a.

#### Students, and their progress in the English core sequence

Cohorts formed around students’ starting level

<table>
<thead>
<tr>
<th>Academic Year</th>
<th>Basic English</th>
<th>Elements of Writing</th>
<th>Transfer level English</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Headcount (each student counted once)</td>
<td>Individual (after one or more attempts) Success Rate</td>
<td>Average number of repeats</td>
</tr>
<tr>
<td>2004/05</td>
<td>299</td>
<td>77.6%</td>
<td>1.3</td>
</tr>
<tr>
<td>2005/06</td>
<td>513</td>
<td>77.0%</td>
<td>1.3</td>
</tr>
<tr>
<td>2006/07</td>
<td>497</td>
<td>72.6%</td>
<td>1.3</td>
</tr>
<tr>
<td>2007/08</td>
<td>515</td>
<td>68.5%</td>
<td>1.2</td>
</tr>
</tbody>
</table>

#### Students starting 2 levels below transfer [ENGL-255]

Data is compiled 3 years from starting the first course in the sequence.

<table>
<thead>
<tr>
<th>Academic Year</th>
<th>Elements of Writing</th>
<th>Transfer level English</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Headcount (each student counted once)</td>
<td>Individual (after one or more attempts) Success Rate</td>
</tr>
<tr>
<td>2004/05</td>
<td>1,150</td>
<td>78.8%</td>
</tr>
<tr>
<td>2005/06</td>
<td>1,021</td>
<td>78.3%</td>
</tr>
<tr>
<td>2006/07</td>
<td>962</td>
<td>78.0%</td>
</tr>
<tr>
<td>2007/08</td>
<td>1,062</td>
<td>78.1%</td>
</tr>
</tbody>
</table>

#### Students starting 1 level below transfer [ENGL-100]

Cohorts formed around the level and year of the student's first English enrollment.

Outcomes within three years of first English enrollment.

<table>
<thead>
<tr>
<th>Academic Year</th>
<th>Transfer level English</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Headcount (each student counted once)</td>
</tr>
<tr>
<td>2004/05</td>
<td>1,008</td>
</tr>
<tr>
<td>2005/06</td>
<td>1,056</td>
</tr>
<tr>
<td>2006/07</td>
<td>950</td>
</tr>
<tr>
<td>2007/08</td>
<td>1,101</td>
</tr>
</tbody>
</table>

#### Students starting at transfer level

Data is compiled 3 years from starting the first course in the sequence.
### Students, and progress in the Math core sequence

**Cohorts formed around students’ starting level**

<table>
<thead>
<tr>
<th>Academic Year</th>
<th>Essential Math</th>
<th>Elementary Algebra</th>
<th>Intermediate Algebra</th>
<th>Transfer Level Math</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Headcount (each student counted once)</td>
<td>Individual (after one or more attempts) Success Rate</td>
<td>Average number of attempts at this level</td>
<td>% of cohort who attempt the next Level</td>
</tr>
<tr>
<td>2004/05</td>
<td>798 73.4% 1.3 51.3%</td>
<td>706 73.4% 1.3 51.3%</td>
<td>706 73.4% 1.3 51.3%</td>
<td></td>
</tr>
<tr>
<td>2005/06</td>
<td>698 72.7% 1.3 54.0%</td>
<td>663 72.7% 1.3 54.0%</td>
<td>663 72.7% 1.3 54.0%</td>
<td></td>
</tr>
<tr>
<td>2006/07</td>
<td>700 69.9% 1.3 54.2%</td>
<td>632 69.9% 1.3 54.2%</td>
<td>632 69.9% 1.3 54.2%</td>
<td></td>
</tr>
<tr>
<td>2007/08</td>
<td>736 67.4% 1.3 54.4%</td>
<td>706 67.4% 1.3 54.4%</td>
<td>706 67.4% 1.3 54.4%</td>
<td></td>
</tr>
</tbody>
</table>

Data is compiled 3 years from starting the first course in the sequence.

**Students starting 3 levels below transfer [MATH 254]**

Data is compiled 3 years from starting the first course in the sequence.

**Students starting 2 levels below transfer [MATH154]**

Cohorts formed around the level and year of the student's first math enrollment. Outcomes within three years of first math enrollment.

*The two-semester versions, MATH-254A/B are treated as separate attempts within the same level.
Progress through the Basic Skills Sequence

Figure 2a. Average classroom composition

**English 255**
- Placed: 64%
- Repeated: 13%
- Equivalency: 1%
- Unknown: 23%

**English 100**
- Placed: 54%
- Repeated: 19%
- Promoted: 18%
- Equivalency: 3%
- Unknown: 6%

**English 1A**
- Placed: 35%
- Promoted: 37%
- Equivalency: 8%
- Repeated: 16%
- Unknown: 4%

Unknown: For the first course in the sequence, "Unknown" may be interpreted as "self-placed".

Placed = the student qualifies via assessment/placement
Equivalency = the student qualifies by way of an equivalency from another institution
Promoted = the student passed the prerequisite course
Repeated = the student is repeating the course

Based on enrollments from four recent years: AY 2007-08 through AY 2010-11.
Source: Cabrillo College Research Data Warehouse.
Progress through the Basic Skills Sequence

Figure 2b.

Average classroom composition

<table>
<thead>
<tr>
<th>Course</th>
<th>Placed</th>
<th>Equivalency</th>
<th>Promoted</th>
<th>Repeated</th>
<th>Unknown</th>
</tr>
</thead>
<tbody>
<tr>
<td>Math 254</td>
<td>62%</td>
<td>6%</td>
<td>22%</td>
<td>16%</td>
<td>21%</td>
</tr>
<tr>
<td>Math 154</td>
<td>39%</td>
<td>6%</td>
<td>22%</td>
<td>30%</td>
<td>2%</td>
</tr>
<tr>
<td>Math 152</td>
<td>34%</td>
<td>7%</td>
<td>28%</td>
<td>30%</td>
<td>2%</td>
</tr>
</tbody>
</table>

Unknown: For the first course in the sequence, "Unknown" may be interpreted as "self-placed".

Placed = the student qualifies via assessment/placement
Equivalency = the student qualifies by way of an equivalency from another institution
Promoted = the student passed the prerequisite course
Repeated = the student is repeating the course

Based on enrollments from four recent years: AY 2007-08 through AY 2010-11.
Enrollments in two-semester sequence MATH-254A/B and MATH 154A/B were excluded.

Source: Cabrillo College Research Data Warehouse.