Identifying and Alleviating Bottleneck Courses

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Academic Performance Solutions

Leading Today's Session

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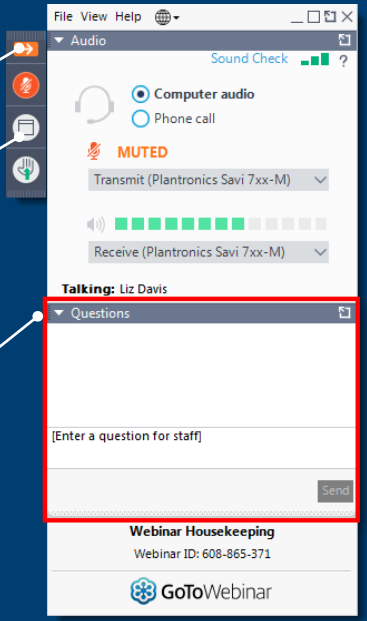

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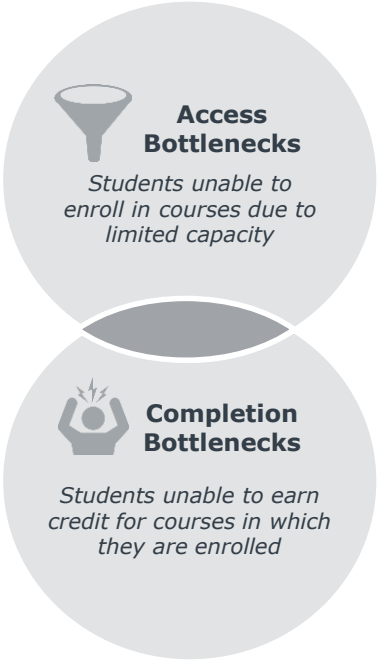
Bottleneck: A Point of Congestion or Blockage

Where Are There Blockages to Student Progress?



26%
Undergraduate courses are over 90% full[1]

8%
Undergraduate courses have below 80% completion[1]

1) Weighted averages by total attempted student credit hours at the institution; n=49 institutions; undergraduate courses only; excluded courses with maximum capacity = 0; Academic Year 2016-2017.

Source: Academic Performance Solutions data and analysis, 2018.

Negative Impacts of Bottlenecks on Students

Potential Impacts of Access Bottlenecks

- Harder to get into the right classes
- Students register for unnecessary courses
- Popular majors increasingly difficult to enter
- Students paying more, but struggling to graduate in desired major

Potential Impacts for Completion Bottlenecks

- Less likely too be retained
- Longer time to degree
- Potential to lose financial aid or scholarships
- Paying for unearned credit

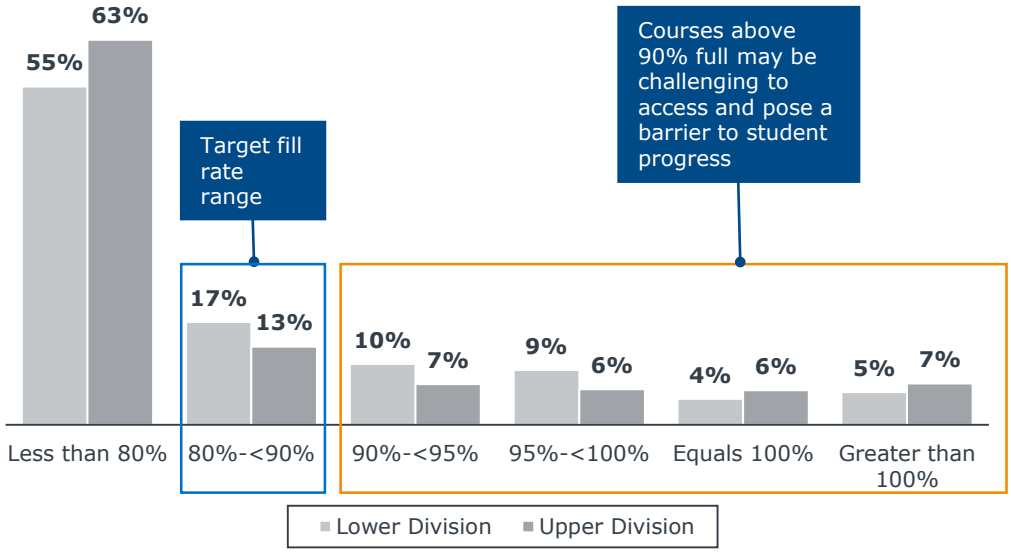
Source: Academic Affairs Forum, *Instructional Capacity Playbook* and *Course Completion Playbook*.

Few Courses at Target Fill Rate

Quantifying Capacity Limitations

Distribution of Undergraduate Courses by Fill Rate[1]

n=49 institutions



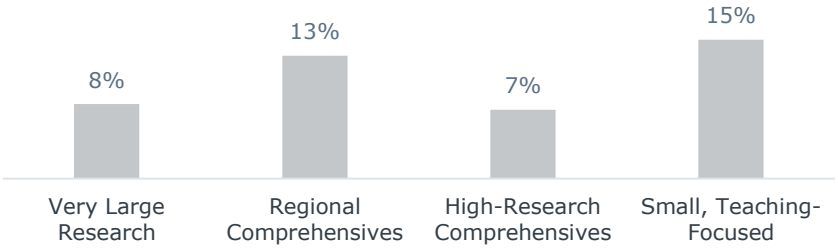
1) Weighted averages by total attempted student credit hours at the institution; n=49 institutions; undergraduate courses only; excluded courses with maximum capacity = 0; Academic Year 2016-2017.

Source: Academic Performance Solutions data and analysis, 2018.

A Closer Look at Over-Filled Courses

Percent of Lower Division Courses at or above 100% Capacity by Cohort[1]

n=49 institutions



- *Engineering*
- *Nursing*
- *Agricultural Sciences*

- *Electrical and Computer Engineering*
- *Visual and Performing Arts*
- *Philosophy*

- *Liberal Arts and Related Studies*
- *Geological, Natural, and Earth Sciences*
- *Social Work*

- *Education*
- *Communication and Journalism*
- *Philosophy*

No clear trend among departments with highest rate of lower division courses at or above capacity

1) Weighted averages by total attempted student credit hours at the institution; n=49 institutions; undergraduate courses only; excluded courses with maximum capacity = 0; Academic Year 2016-2017.

Source: Academic Performance Solutions data and analysis, 2018.

Bringing Demand into the Equation

Do Changes in Demand Match Changes in Capacity?

Trends Across the Collaborative[1]

Education

3.1%

Attempted SCH

3 Year Average Annual Growth Rate

0.1%

Available Seats[2]

3 Year Average Annual Growth Rate

Social Work

3.8%

Attempted SCH

3 Year Average Annual Growth Rate

0.9%

Available Seats[2]

3 Year Average Annual Growth Rate

Next Step

- Use APS to identify areas of growth at your institution
- Determine if there is already sufficient capacity or need plan to meet new demand

1) Trends are annual average change from academic year 2015 to academic year 2017; n=49 institutions; undergraduate courses only; excluded courses with maximum capacity = 0; Academic Year 2016-2017.
2) Available seats is calculated as the total capacity for all undergraduate courses.

Source: Academic Performance Solutions data and analysis, 2018.

Ensuring Sufficient Access

Strategies to Realign Resources

Track and Predict Changing Student Demand

Demand patterns and the changing mix of credits students bring in mean enrollments are less constant across terms and years, and adjusting capacity becomes more difficult close to course start dates.

Sample Tactic:

Central Course Wait Lists

- To account for demand changes during the registration periods, allow an unlimited number of students to wait list themselves for each course
- Limit the number of wait lists each student may join
- Open new sections when the waitlist reaches minimum section size

Expand Capacity in High-Demand Areas

In programs with high and growing student demand, not only are students unable to register for courses, but faculty are often overloaded and unit leaders must hire adjuncts to teach courses.

Sample Tactic:

Overflow Capacity During Off-Peak Summer or Winter Sessions

- Create capacity for high-demand courses during summer, winter sessions; online; and in accelerated, late-start format
- Provides more flexibility for faculty and students and can be a revenue generator for academic units

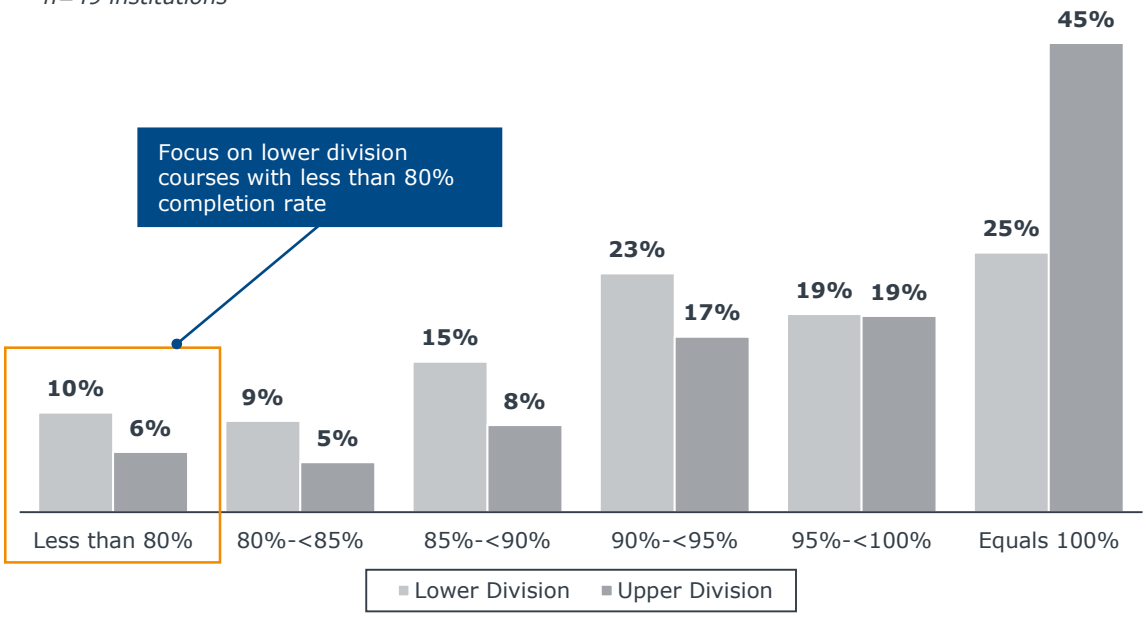
Resource Available: Instructional Capacity Playbook

Source: Academic Affairs Forum, *Instructional Capacity Playbook*.

Getting In, But Not Getting Credit

Distribution of Undergraduate Courses by Completion Rate[1]

n=49 institutions



1) Averages weighted by total attempted student credit hours at the institution; Academic Year 2016-2017.

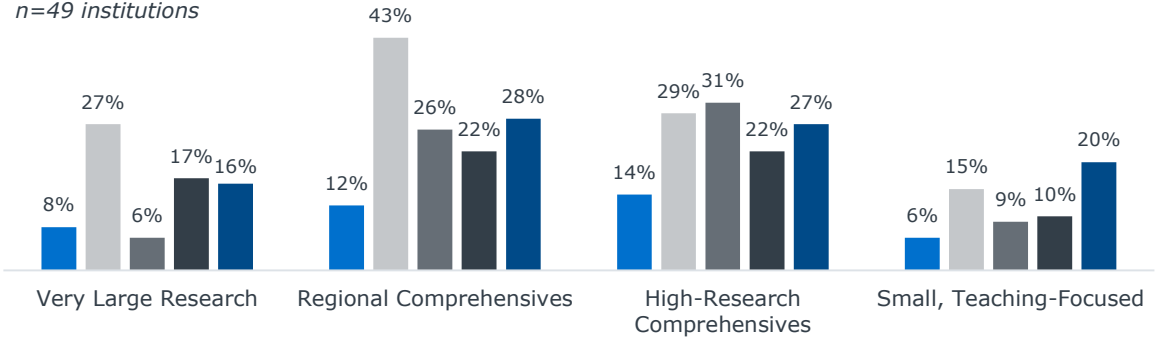
Source: Academic Performance Solutions data and analysis, 2018.

Completion Bottlenecks Concentrated

Four Departments: 9% of Lower Division Courses, but 21% of Bottlenecks

Percent of Lower Division Courses at or below 80% Course Completion[1]

n=49 institutions



Next Step

Use APS to determine where your institution has the highest rate of completion bottlenecks.

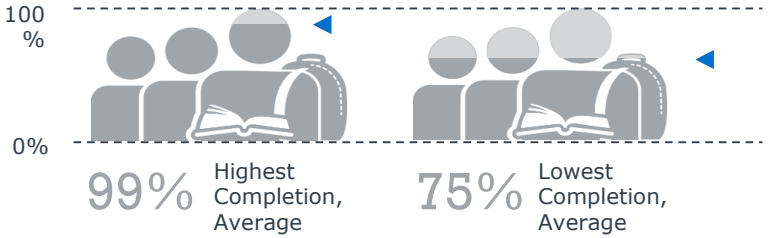
1) Averages weighted by total attempted student credit hours at the institution; undergraduate courses only; Academic Year 2016-2017.

Source: Academic Performance Solutions data and analysis, 2018.

Drilling into Multi-Section Courses

Range of Section Completion Rate: The difference between the highest and lowest completion rates for sections of the same course

Range of Section Completion Rates[1]



A Deeper Dive: Average Section Completion Rate Range in Gateway Courses[2]

Analysis of 34 institutions in the APS Collaborative found that **Calculus** and **English** have the greatest variation among sections of the same course.

Intro to Biology	23 pts	⚠ Calculus I	38 pts
Intro to Chemistry	23 pts	⚠ Intro to English	38 pts
Intro to Psychology	25 pts		

1) Averages weighted by total attempted student credit hours at the institution; undergraduate courses only; Academic Year 2016-2017; n=49 institutions.
2) Methodology: Identified introductory courses at each institution, then calculated average range of completion rate for each course with two or more sections at each school in the collaborative. Academic Year 2015-2016; n=34.

Source: Academic Performance Solutions data and analysis.

Supporting Course Completion

Strategies to Address the Root Cause of Low Completion

Early and Frequent Low-Stakes Assessment

Students are often unable to measure their progress until the first summative assessment, typically a midterm exam.

Strategy

- Use frequent, low-stakes learning assessments so students can check their progress early and often
- Can take a wide range of forms, from simple conversations in class, to written quizzes, to fully adaptive online learning tools

Shared Use of Materials and Standardized Assessments

Lack of coordination and standardization across course sections leads to widely varied experiences and results for students.

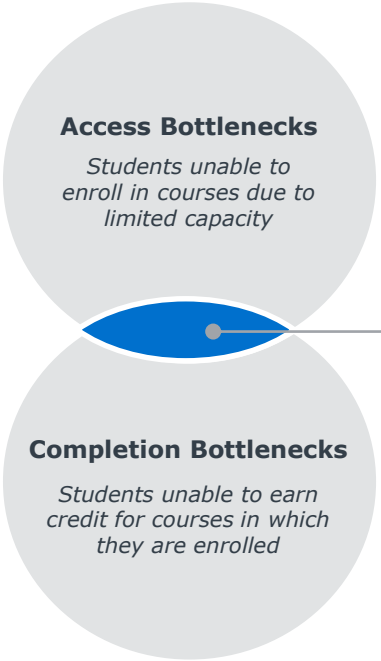
Strategy

- Establish clear learning outcomes and a set of shared materials and assessments across course sections to support a common standard for student achievement
- Ensure assessments test the same knowledge and skills across sections

Resource Available: Course Completion Playbook

Source: Academic Affairs Forum, *Course Completion Playbook*.

Addressing Capacity and Completion



Identifying Courses with Limited Capacity and Low Completion[1]

1.4%

of undergraduate courses are both over 90% full and have a completion rate below 80%

- **56%** of these courses are lower division
- **10%** of undergraduate Mathematics and Statistics courses are both types of bottlenecks

1) Averages weighted by total attempted student credit hours at the institution; undergraduate courses only; Academic Year 2016-2017.

Source: Academic Performance Solutions data and analysis, 2018.

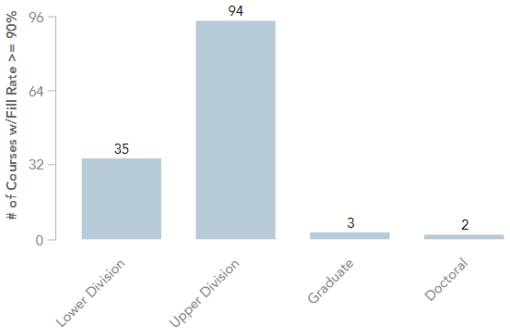
Your Next Steps in APS

Two Reports to Identify Bottlenecks

Access Bottlenecks

Find on the Students tab

Number of Bottleneck Courses by Course Division (Fill Rate >=90%)



Completion Bottlenecks

Find on the Students tab

Courses with the Highest Unearned Credit Hours

Course Code	Attempted Credits	Unearned Credits	Completion Rate [%]
MATH162M	5,547	1,449	73.9%
STAT130M	6,210	1,293	79.2%
MATH103M	5,031	1,272	74.7%
COMM101R	8,478	1,104	87.0%
MATH211	3,556	1,000	71.9%
HIST104H	5,388	903	83.2%
ENGL112L	8,169	849	89.6%
PHIL110P	4,848	741	84.7%
CHEM121N	3,450	714	79.3%

Source: Academic Performance Solutions

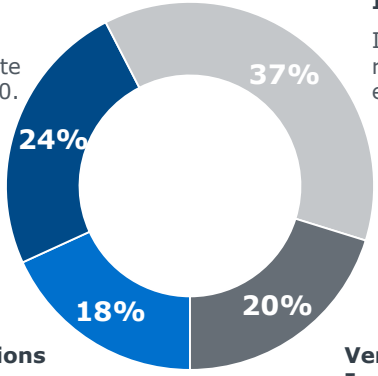
Appendix

49 Institutions Grouped into Four Cohorts[1]

APS Benchmarking Cohort Distribution[2]
(N = 49)

High-Research Comprehensive Institutions

Institutions with more than $10M in research activity and an undergraduate enrollment between 5,000 and 10,000.



Regional Comprehensive Institutions

Institutions with less than $10M in research activity and an undergraduate enrollment around 10,000.

Small, Teaching-Focused Institutions

Institutions with little to no research activity and an undergraduate enrollment less than 5,000.

Very Large Research-Intensive Institutions

Doctoral institutions with high to very high research activity and an undergraduate enrollment greater than 10,000.

1) The four APS Benchmarking Cohorts are derived using undergraduate student population size, research activity, and Carnegie Classification.
2) Percentages may not add up to 100 due to rounding.

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