EAB

Recommended Readers

Deans, associate deans, department chairs, and other individuals who are users of the APS platform

Elevate Data Literacy to Achieve Data-Informed Decision-Making

APS Data Literacy Training Toolkit

Academic Performance Solutions

Academic Performance Solutions

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About EAB

EAB is a best practices firm that uses a combination of research, technology, and data-enabled services to improve the performance of more than 1,200 educational organizations. EAB forges and finds the best new ideas and proven practices from its network of thousands of leaders, then customizes and hardwires them into every level of member organizations, creating enduring value. For more information, visit eab.com.

About Academic Performance Solutions

Now more than ever, institutional success depends on university leaders taking a strategic, methodical approach to university management—and that starts with the right data. Academic Performance Solutions (APS) is a solution designed to empower academic and financial leaders with the department-specific performance and cost data—as well as reliable peer benchmarks—they need to make more effective decisions.

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Disclaimer: Content within this document is proprietary and confidential. For additional details, please see page 2.

Introduction

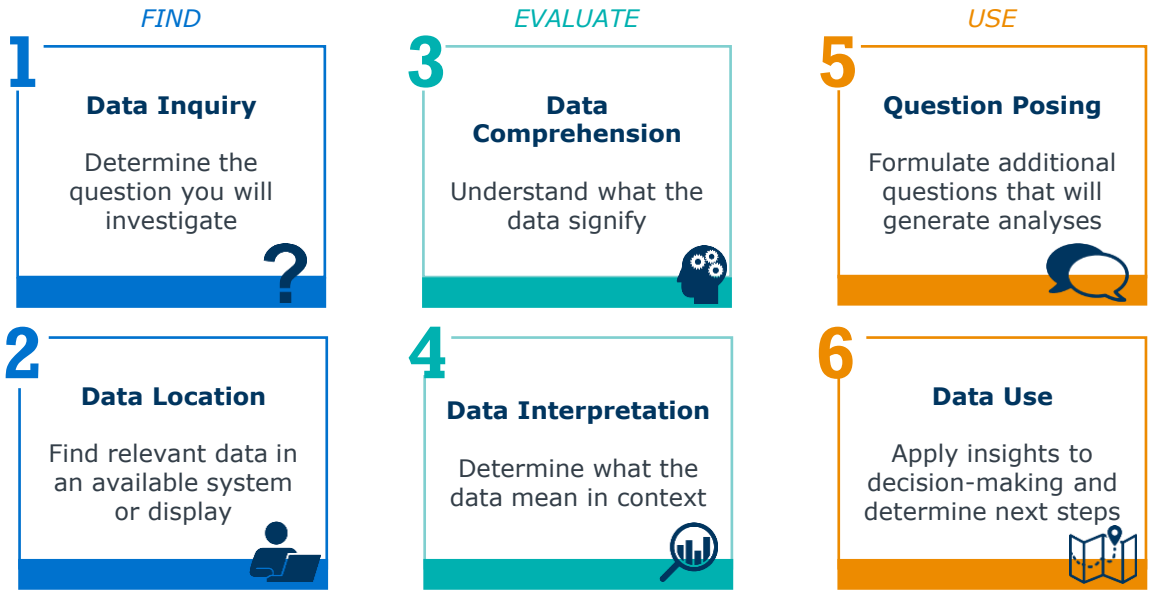
Introduction

Arming Leaders with Building Blocks to Create a Data-Informed Culture

As the higher education landscape continues to evolve, the necessity and importance of using data to make more informed decisions regarding resource allocation, student progress, course management, and more is more pressing than ever before. The shift toward transforming into a data-informed culture is critical for achieving institutional goals and supporting staff and students but is often difficult on unit leaders. While these individuals can be empowered with direct access to data to make informed decisions about academic units under their purview, access to data alone does not create data experts overnight. Some individuals may naturally take to data; others may not. Furthermore, being directed to use data without being provided with the necessary support is frustrating and disincentives compliance.

> The ability to read, write, and communicate data in context, including an understanding of data sources and constructs, analytical methods and techniques applied—and the ability to describe the use case, application, and resulting value.
>
> *Definition of data literacy from Gartner*

Data literacy is the cornerstone for successfully building data-informed cultures. Without strong data literacy, users are insufficiently armed with the necessary tools to use, interpret, and act on data. Through partner conversations and research conducted across the last decade by EAB, we have identified six skills essential to being a data literate individual.



This toolkit is designed to support users of the APS platform in laying the groundwork for data literacy by understanding basic statistics, data definitions, and methodology, as well as how to reconcile data incongruities and use data to tell a compelling story.

Recommendations: When to Use This Toolkit

- New user training/onboarding
- Pre-work if your institution has selected to host a Data Institute
- Refresher before training led by APS Strategic Leader or your institution's designated APS Trainer

Source: U.S. Department of Education report *Teachers' Ability to Use Data to Inform Instruction: Challenges and Supports (2011) ; Panetta, Kasey. (2019, February 6). A Data and Analytic Leader's Guide to Data Literacy. Retrieved from https://www.gartner.com/smarterwithgartner/a-data-and-analytics-leaders-guide-to-data-literacy;* EAB interviews and analysis.

Data Inquiry

SKILL 1

Defining Your Purpose for Data Use

Common Processes APS Data Support to Make Informed Requests and Decisions

Academic and financial leaders are responsible for innumerable decisions at their respective institutions. As the higher education landscape evolves, including student preferences, and resources become constrained, leveraging the power of data to inform decisions is not an option – it is a necessity. But data use is full of uncertainty when the *why* is not understood. Understanding *why* you are being asked to use, interpret, and apply data is an important component to laying a strong foundation for your data literacy journey.

Activities to Embed APS Data for Better Decision-Making

The APS platform provides leaders with easy access to college, department, program, and course-specific data to heighten insight into performance, resource use, and opportunities for enhanced efficiencies. While APS data can be used to support many activities, the four activities below are core to APS data use.

Activity	Sample APS Metrics to Use	Questions Answered by APS Data
Map Full-Time Instructional Staff Capacity to Student Demand *Assess true need for additional faculty, submit data-informed requests, and assign faculty accordingly*	• Total Attempted Student Credit Hour (SCH) • Sections Below, Within, or Above Recommended Fill Rate • Median SCH Workload per Instructor • Trends in Cost per SCH	• Is course demand trending towards needing more faculty? • How efficient are current course and section offerings? • Can instructional capacity meet course demand? • Is there a need to reallocate staff or add an additional faculty line?
Align Course Offerings with Student Demand *Effectively serve students and balance instructional workload by strategically planning course and section offerings*	• Comparison of Demand vs. Capacity by Department • Impact of Course Bottlenecks on Course Completion • Median Class Size Benchmark • Unique Students Registered • Courses with Forecasted Changes	• Are course and section offerings aligned with student demand? • Are there opportunities to reallocate resources from low to high-demand courses? • What courses/sections are at risk of under- or overfilling during course registration?

Resources

- APS Faculty Line Planning Overview Video
- Make Data-Informed Faculty Line Decisions; Example Faculty Line Request Template (APS platform, Help & Training dashboard, How-to Guides tab)

Resources

- APS Course Planning Overview Video
- Aligning Distinct Course Offerings with Student Demand; Matching Section Offerings with Demand; Measuring Student Demand for Courses (APS platform, Help & Training dashboard, How-to Guides tab)

Continues on next page

Activity	Sample APS Metrics to Use	Questions Answered by APS Data
Understand and Recognize Programs with Reform or Growth Opportunity *Frequently monitor department or program health and performance to ensure progress towards goals and efficient use of resources*	• Intercurricular Dependencies by Department • Fall-to-Fall Program Retention vs. 3-Year Trend in Program Enrollment • Percent of Classes with Size < 10 • Courses with Highest Unearned Credit Hours	• Is student demand being met? • Are there growing departments or programs that require additional resources? • Are students enrolled in the same course having similar experiences? • Is student progress supported?
	Resources • Manage Your Program Portfolio for Efficiency; Inform Your Unit's Review Process; Diagnose Student Demand and Progress Barriers (APS platform, Help & Training dashboard, How-to Guides tab)	
Improve Course Completion, Retention, and Equity *Identify courses for course completion and retention improvement to promote student progress*	• Completion Rate vs. Attempted Credit Hour Production by Course • Earned Credits and Final Grades by Course Code • Courses with the Highest Unearned Credit Hours	• Is there high section variation in course completion rates? • Are students receiving equitable, similar experiences across sections of the same course? • In which courses are students struggling to earn credit? • In which courses will course completion rate improvement efforts have an outsized effect?
	Resources • Diagnose Student Demand and Progress Barriers; Identifying Opportunities for Course Completion Improvement (APS platform, Help & Training dashboard, How-to Guides tab)	

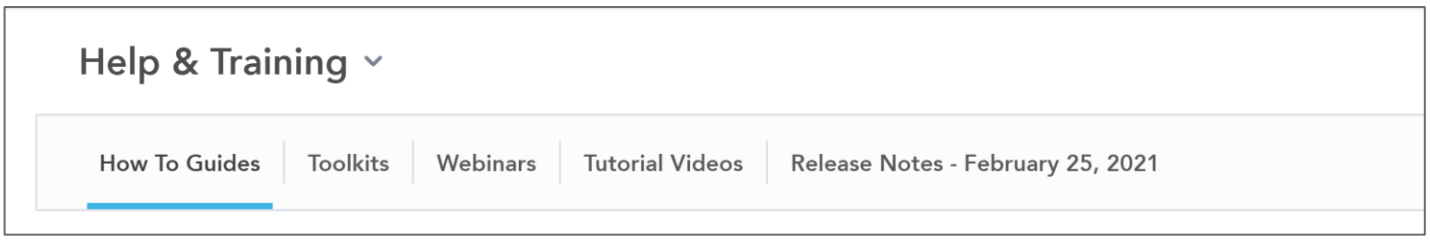
Resources to Support Smarter Decision-Making

Resource Roundup: APS Toolkits, How-to Guides, Tutorial Videos, and Webinars

The APS team has created resources, such as how-to guides and tutorial videos, that provide users with detailed guidance on how to use analyses in the APS platform to support decision-making.

Access Resources in the APS Platform

The Help & Training dashboard in the APS platform is organized by content. Each tab contains resources that align with the purposes for data use outlined in Defining Your Purpose for Using Data section of this document.



How-To Guides

APS Platform User Guide and how-to guides organized by strategic areas: Enrollment Growth, Cost Efficiency, and Student Outcomes.

- APS Platform User Guide: Brief overview of the APS platform
- How-to Guides: Step-by-step guidance to support your academic activities, such as course planning

Toolkits

Toolkits and related resources to support your institution's planning processes, like annual unit health check-ups.

- Toolkits: Guides for selecting and finding relevant data, along with communication templates (intended for individuals who hold APS project roles)
- Related Resources: EAB best practice research and strategies

Tutorial Videos

On-demand short videos that walk users through how to navigate the platform, as well as how to understand tab-specific reports and other concepts.

- Logging Into and Navigating the APS Platform
- Department Scorecard tab reports

Webinars

Live and on-demand sessions focused on topics, like using new platform features, embedding data in planning processes, and deploying strategies.

- Webinars and Other Virtual Events: Recorded sessions led by APS experts that teach users how to use specific data and platform features, as well as how to employ strategies to support use.

Data Location

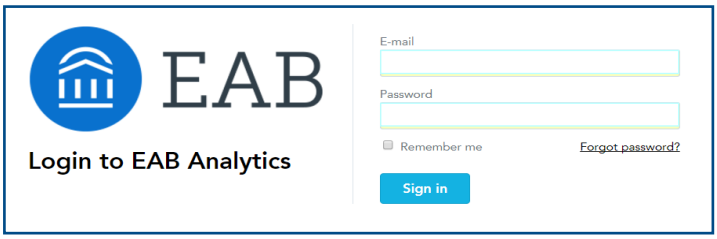
SKILL 2

Logging Into the APS Platform

User access to the APS platform is determined by the institution's APS Leadership Team. Most institutions grant access to a variety of users, including deans and department chairs.

1 Open the login page

https://reports.eabanalytics.com



2 Enter your institutional e-mail address and APS password[1].

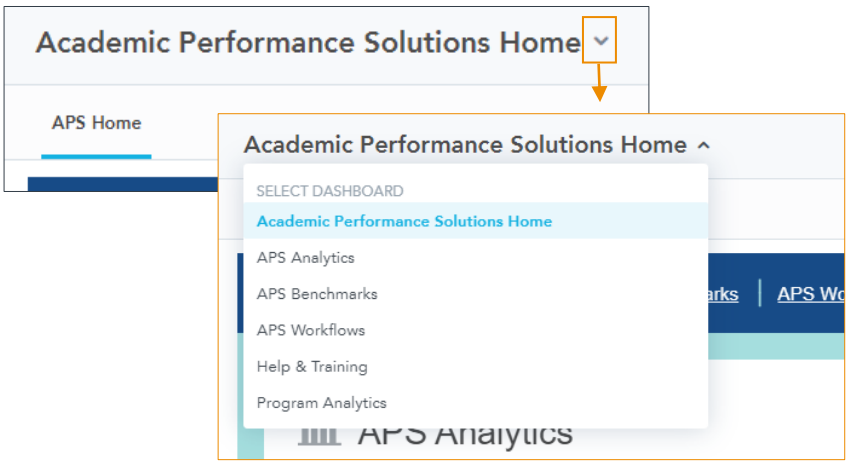
Your institution may have single sign on (SSO) implemented with the APS platform, meaning you must use the institutional email address associated with your SSO system.

3 Click to sign in.

If this is your first time accessing your account or if you have forgotten your password, please use the "Forgot password" link to create a new password.

Please reach out to APSSupport@eab.com with login issues.

Once logged in, the first screen users see when they log into the platform for the first time is the APS Home Page (see next page for more information). You may use the APS Home Page to navigate to different parts of the APS platform. You may also use the **dashboard drop-down menu**, which is located at the top left of your screen next to the dashboard name which you're currently on.



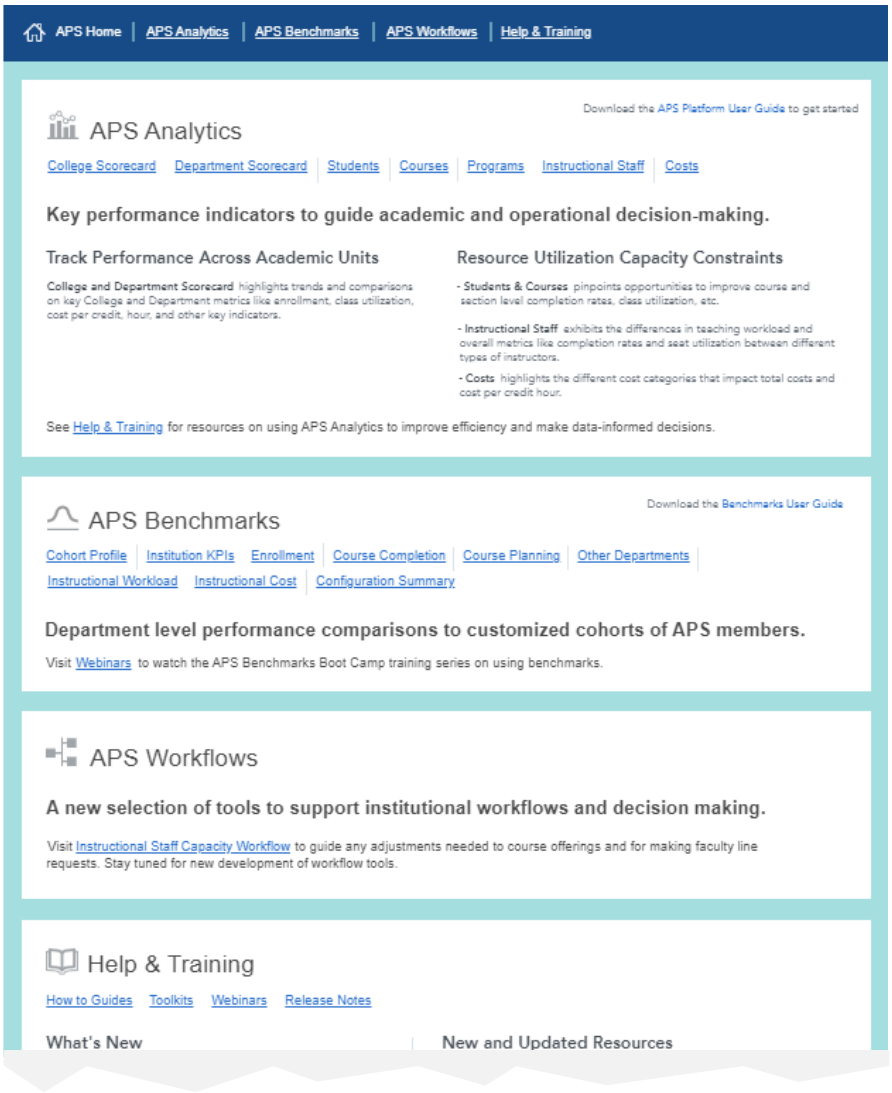
1) This is not the same as your EAB.com username and password.

Source: Academic Performance Solutions.

Using the Home Page to Navigate the APS Platform

APS Home Page

The APS Home Page is the first screen users see when they log into the platform for the first time. When continuing the same session, users will not be directed to the Home Page; instead, they will be taken to the last tab they were on in their previous session.



Quick Access to…

Dashboards

Links at the top of the Home Page provide easy access to dashboards in the APS platform. Links appear in the order in which the dashboards are outlined on the rest of the page.

Tabs

Located within its relevant section on the Home Page, links to tabs on the APS Analytics, APS Benchmarks, and Help & Training dashboards take you directly to the tab.

Supporting Resources

Resources, such as user guides and on-demand webinar trainings, support users in understanding the APS platform and how to use it.

Latest News

The Help & Training section links to its corresponding dashboard, which houses information about the most recent APS releases and resources, as well as upcoming events.

From any dashboard, jump to the APS Home Page by clicking on the "Back to APS Home" button located at the top right. You may also use the dashboard drop-down menu and click on Academic Performance Solutions Home.

Source: Academic Performance Solutions.

Describing the APS Platform

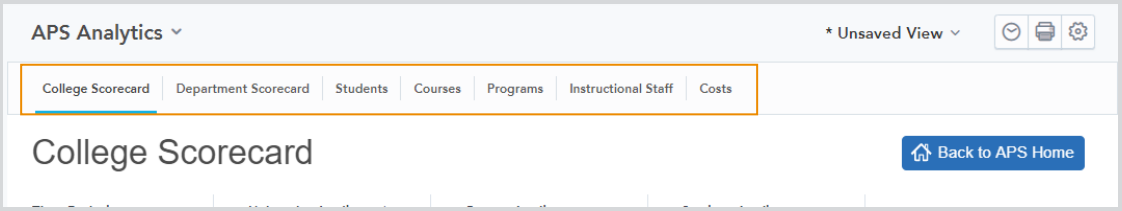
Dashboards, Tabs, and Reports – All in One Platform

The APS platform contains six dashboards, which each contain tabs. On each tab are reports and analyses that users can leverage to support academic decision-making.

DASHBOARDS

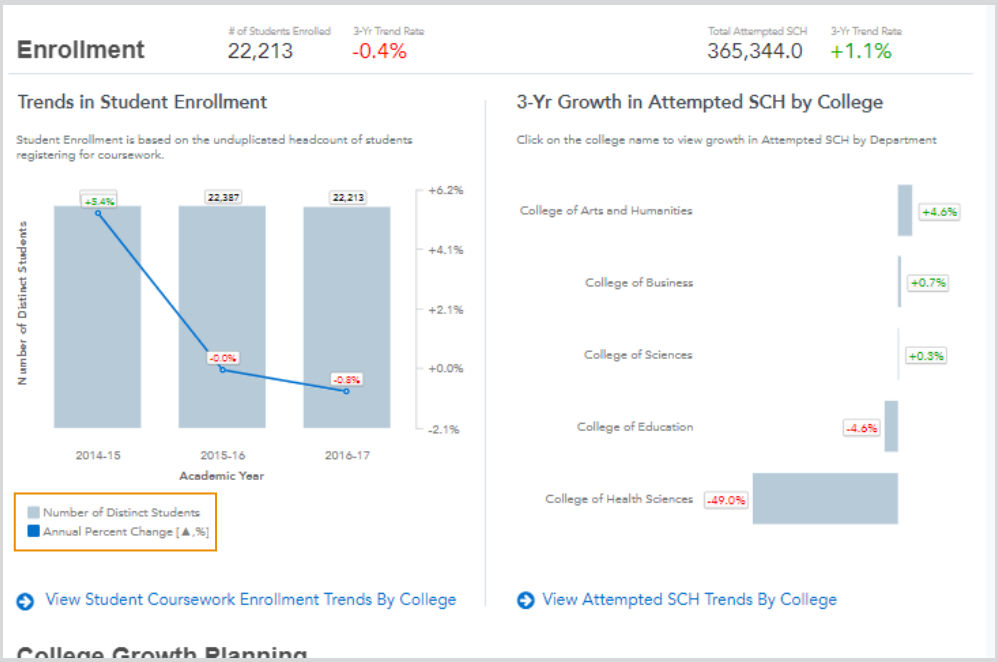
- APS Home Page
- APS Benchmarks
- Program Analytics
- APS Analytics
- APS Workflows
- Help & Training

TABS



Tabs, such as College Scorecard, are located at the top of each dashboard.

REPORTS & METRICS



Reports, such as Trends in Student Enrollment, are located throughout each tab and take various forms. For example, reports can be displayed as Key Performance Indicators (KPIs) or charts.

Metrics, such as Number of Distinct Students and Annual Percent Change, are located within reports.

Source: Academic Performance Solutions.

Data Comprehension and Interpretation

SKILLS 3&4

Guide to Basic Statistics for Data Analysis

The first step to cultivating one's own data literacy is having a strong understanding of basic statistics. Statistics is a branch of mathematics dealing with the collection, analysis, interpretation, and presentation of masses of numerical data. With a strong understanding, users will be able to confidently approach, interpret, talk about, and apply insights derived from data.

Term	Definition	Importance
Causation	When one event causes another to occur; very difficult to prove	Results can appear to be due to causation when they are not. It's important to be able to make the discernment.
Confidence Level	A measure of how confident you are of the result you have attained	This demonstrates the importance of sample size, since confidence level is the percentage of times that the different samples would produce the same result.
Correlation	A relationship between two variables	Correlation is important to understand when trying to identify and speak about the results of analyses.
Margin of Error	The maximum expected difference between the true population result and the estimate of the result found for the sample; must be paired with confidence level when referencing outcomes of the analysis	Like confidence level, margin of error also demonstrates the importance of sample size. Margin of error is the range of values below and above the sample statistic in a confidence interval.
Predictive Analytics	Analytics that use historical data to predict future trends and behaviors	It's important to understand that this type of analytics leverages historical data to make predictions, such as likelihood of graduation, to accurately interpret results.
Selection Bias	A bias that is introduced when selecting the members of a sample so that the sample does not accurately represent the population under analysis	Selection bias, such as comparing students who attend office hours to students who do not attend office hours, is important to understand when interpreting results.
Statistically Significant	When there is a very low likelihood (typically 5%) that the outcome has occurred by chance	Results that are important or notable are often conflated with something that is statistically significant, so it's essential to understand the difference.

Sources: Statistics. In The Merriam-Webster.com Dictionary. Retrieved from https://www.merriam-webster.com/dictionary/statistics; Udemy Editor. (2014, May 6). Positive Correlation Examples: Can You Relate? Udemy Blog. https://blog.udemy.com/positive-correlation-examples/

Differentiating Related Terms

In statistics, a few terms are related and are often mistaken for one another. It is essential to understand the difference between terms to be able to accurately interpret and describe analyses.

Percent Change vs. Percentage Point Change

- **Percent Change**: The ratio of one percentage to another; typically not used with small samples since percent change falsely makes results seem more substantial than in actuality
- **Percentage Point Change**: The numerical difference between two percentages; often used to track change over multiple years

▶ *Example: An increase from 40% to 50% is a 25% increase, but a 10-percentage point increase. These values are notably different.*

Population Size vs. Sample Size

- **Population Size**: The size of the population of a given group
- **Sample Size**: The size of the population whose characteristics are being observed; sample size should be appropriate to estimate the impact of the potential results if applied to the entire population.

▶ *Example: In an analysis analyzing the change in course completion rates due to the implementation of new strategies like standard assessments, the population is all students enrolled in a department's courses in one academic year; the sample size is the group of enrolled students who the strategy is being applied to.*

Describing the Data

Most sets of data can be described using measures of central tendency and/or measures of dispersion. Central tendency describes what is occurring in the entire data set, not individual pieces of data. Measures of central tendency help us determine where a data set is centered. There are three common ways to show central tendency.

Measures of Central Tendency

Central Tendency Measure	Definition	How to Find It	Example
Mean	The average of a set of values	Calculate the sum of all values in the data set and divide by the number of items in the set.	$\frac{(2+4+6+8)}{4} = \frac{20}{4} = 5$
Median	The middle of a set of values; represents the 50th percentile	Place your data in order from smallest to largest or largest to smallest and locate the value in the center of the data set.	Original data set: 1, 7, 3, 56, 19, 22, 4 Smallest to largest: 1, 3, 4, 7, 19, 22, 56
Mode	The most common value in the data set	Place your data in order from smallest to largest or largest to smallest and locate the value that appears the most.	Original data set: 6, 3, 7, 8, 7, 1, 0, 3, 3 Smallest to largest: 0, 1, 3, 3, 3, 7, 7, 8

Outliers, which are extremely high or low values, can affect measures of central tendency – particularly the mean.

Example: With outliers: 1, 200, 201, 203, 204, 210, 650 → Mean: 238

200, 201, 203, 204, 210 → Mean: 204

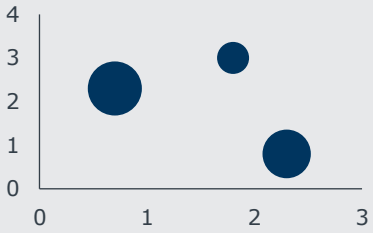
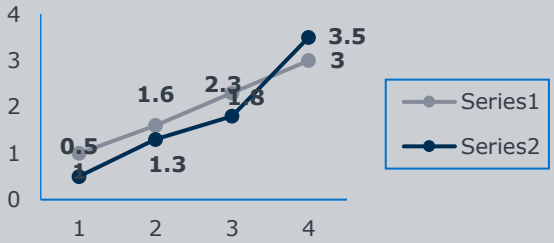
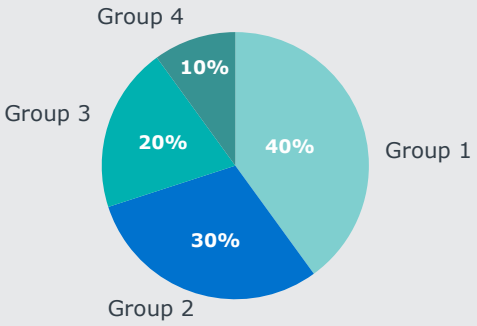
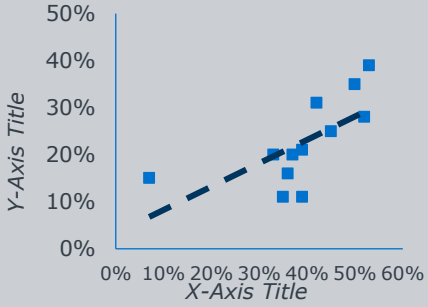
Measures of Dispersion

Measures of dispersion help determine the spread of the values in a data set. Of the several different measures, two of the most common measures are detailed in the table below.

Dispersion Measure	Definition	Example
Standard Deviation	The square root of the variance of your population or sample that shows how spread out values are from the mean. • Low standard deviation: Most values are close to the mean • High standard deviation: Values are more spread out.	Variance: 3.2 Standard deviation: $\sqrt{3.2}$ = **1.788854382**
Variance	The average of the squared differences from the mean of your population or sample.	Data set: 10, 11, 11, 13, 15 Calculate the Mean: $\frac{(10 + 11 + 11 + 13 + 15)}{5} = 12$ Calculate the difference of each value in the sample from the mean. Then square the difference. 10 - 12 = -2 → $-2^2 = 4$ 11 - 12 = -1 → $-1^2 = 1$ 11 - 12 = -1 → $-1^2 = 1$ 13 - 12 = 1 → $1^2 = 1$ 15 - 12 = 3 → $3^2 = 9$ Calculate the mean of the squared differences: $\frac{(4+1+1+1+9)}{5} = 3.2$

Presenting the Data

Showing the data in an effective visual manner is vital to ensuring that the audience will fully understand the power of the insights being shared with them. There are many types of data visuals – the most common visuals are detailed in the table below.

Type of Visualization	Purpose	Example
Bar/Column Chart	Compares quantities of different categories. Especially useful to highlight large differences between populations.	
Bubble Chart	Shows joint variation of three data items. *Note: Be careful when using these charts, since it is difficult to distinguish the difference between a bubble that is 3x vs 4x the size of the original bubble.*	
Line Chart	Tracks changes or trends over time and shows the relationship between two or more variables. Especially useful if you wish to show trends over a long period of time, or if you want to show highlight a small difference between two populations.	
Pie Chart	Compares parts of a whole. *Note: Be careful when using these charts. Never compare two pie charts without clearly noting that the size of the pie may have changed as well.*	
Scatter Plot	Shows joint variation of two variables.	

Source: Tableau. *Visual Analysis Best Practices: Simple Techniques for Making Every Data Visualization Useful and Beautiful*. https://www.tableau.com/sites/default/files/media/whitepaper_visual-analysis-guidebook_0.pdf.

APS Key Terms and Definitions

Leveraging In-Platform Resources to Better Understand the Data

Glossary of Terms

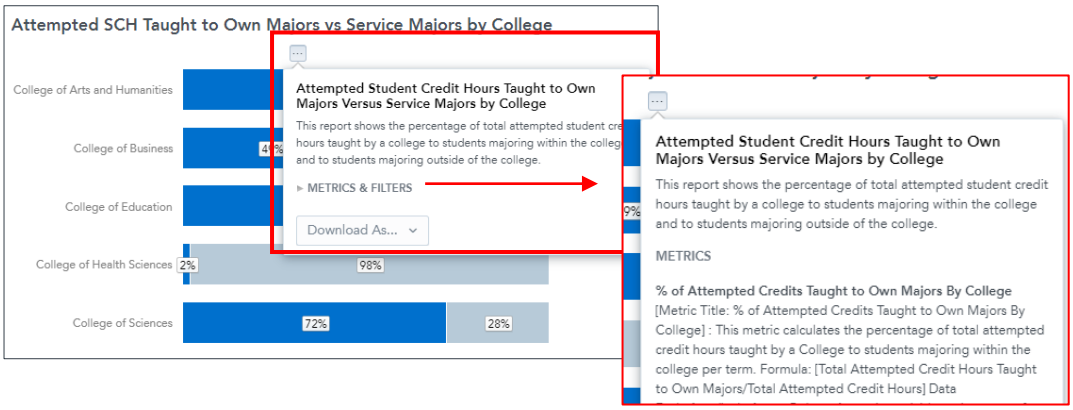
Many of the terms and metrics within the APS platform will be familiar to you but definitions may vary by institution. The APS team has compiled a glossary of key terms to help you better understand analyses.

Glossary Available in the APS Platform User Guide

1. Visit https://reports.eabanalytics.com/ to log into the APS platform.
2. Download the APS Platform User Guide on either the APS Home Page (top right) or How to Guides tab on the Help & Training dashboard.

Metric Definitions in the Platform

Within the APS platform, you can also hover over metrics to view the definition and formula.



Definitions and Formulas Available in the Platform

1. Hover over the center of any report until an ellipsis (…) appears.
2. Click the ellipsis icon to open the 'Metrics & Filters' drop-down menu.
3. Click on the 'Metrics & Filters' drop-down menu to view definitions for each component of the analysis, including formulas.

Methodology Behind APS Data

Enrollment, Instructional Staff, and Costs Methodology

The APS team extracts data from multiple source systems – student, HR, and finance – to improve data transparency across your institution. Our implementation team then validates and configures the data in a thorough process. Since the data is configured specifically for the APS platform, your institution's configuration decisions will affect how your data appear in the platform. The data may differ from the way it appears in other data sources.

Below is a brief overview of APS's methodology approach in three different categories: enrollment, instructional staff, and costs. Contact your APS Strategic Leader for additional information.

Enrollment

How are attempted student credit hours (SCH) calculated?

Attempted SCH are calculated based on where credit was attempted, not by the student's major.

Student Major: Communication

Student Courses for Academic Year 2016: ENG101 and HIS101

Academic Year	2016-17
College Name	# of Registered Students
College of Arts and Humanities	16,357
College of Business	5,041
College of Education	1,132
College of Health Sciences	871
College of Sciences	14,493
Rollup	22,213

Counted once in the College of Arts and Humanities.

Academic Year	2016-17
Department Name	# of Registered Stude
Art	1,850
Communication	6,685
Dance	
English	7,484
French	1,918
German	
History	4,647
Linguistics	66

Counted once in English Department, once in History Department. Not included in Communication Department enrollment.

How are attempted SCH aggregated for each course?

Total attempted SCH for each course is the sum of all individual attempted SCH.

Each Student's Individual Attempted Student Credit Hours

Total Attempted Student Credit Hours in the Course

Attempted SCH are then calculated by course categories and over time…

Attempted SCH Aggregated by Course Categories

- By Level, Division
- By Course Type

Attempted SCH Over Time

- The compound annual growth rate of the time period based on the first and final year values

How are attempted SCH calculated for cross-listed sections?

Data from cross-listed sections, which are either provided by the institution or identified by the APS Technical team as sections occurring at the same time and place, are rolled up under the master section. When looking at the course reference number for the master section, the enrollment and total attempted SCH of the master section represents the sum of enrollment and attempted SCH across the cross-listed sections. The capacity of the master section can be configured to be either the sum or the maximum capacity of the cross-listed sections.

Use the *Which of Your Courses Are Cross-Listed?* report on the Courses tab in the APS Analytics dashboard to view which sections are cross-listed and how metrics roll-up in the master section.

Source: Academic Performance Solutions.

Instructional Staff

How are instructional staff assigned to colleges and departments?

Tenured

Staff assignments are made based on where instructional staff teach most of their courses, not the department from which their salary is paid. This reflects where instructors are spending most of their time and accounts for instructors who teach a large share of courses outside of their home department.

Home Department: Chemistry

Teaching 2 courses in Chemistry department and 3 courses in the Biology department

→ Assigned Department: Biology

How are instructional staff categorized?

Staff are categorized by instructor type. Tenure status is used to divide teaching staff into instructor categories.

APS Standard Instructor Types

Tenured | Tenure Track | Non-Tenure Track | Graduate Assistant | Adjunct

How are instructional staff aggregated?

Staff are aggregated by instructor type, assigned college, and assigned department.

10 Tenured Professors + **8** Tenure Track Instructors + **2** Non-Tenured Instructors = **20 Instructional Staff Members in the College of Fine Arts**

How is instructor courseload calculated?

Count of distinct course sections taught is calculated for all teaching staff and aggregated by instructor type, assigned college, and assigned department.

BIO 101 Section + BIO 101 Section + BIO 210 Section = **Instructor Courseload of 3**

For sections taught by multiple instructors, courseload is determined by instructors' percent responsibility for each section taught

Costs

How are direct costs categorized?

Direct costs are categorized based on four cost categories to reflect the department general ledger. This methodology ensures that central overhead costs are not considered when determining the cost per student credit hour.

Cost Categories (may differ by institution)

1. **Instructional Staff Salaries**: Salaries for instructional staff
2. **Non-Instructional Staff Salaries**: Salaries for non-instructional staff, paid by departments or colleges
3. **Benefits**: Benefits for instructional and local staff
4. **General Operating Expenses**: General operating expenses paid by departments or colleges, such as lab equipment and paper used to print exams

How are instructional costs allocated?

Instructional costs are allocated to departments and colleges by budgeted department, meaning the department that pays their salary even if the staff member mostly teaches in another department. Costs reflect department budgets, which is consistent with academic leadership's view of department-level and college-level budget.

Home Department: Chemistry

Teaching 2 courses in Chemistry department and 3 courses in the Biology department

→ Instructional costs allocated to Chemistry department

How is total college cost per SCH calculated?

Direct costs are aggregated by colleges and departments across account categories, so cost per student credit hour is calculated by dividing total direct costs by total attempted credit hours produced within a department or college.

Example Calculation

$$\frac{\$14\text{ M}\ \text{College Instructional Staff Salaries} + \$1.2\text{M}\ \text{College Local Staff Salaries} + \$3.9\text{M}\ \text{College Benefits} + \$1.7\text{M}\ \text{College Operating Expenses}}{103{,}601\ \text{College Attempted Student Credit Hours (SCHs)}} = \$200.77\ \text{Total College Cost per SCH}$$

Department vs. Program

A department is defined as an **operational unit** composed of instructors and administrators who share teaching, managerial, and research/service responsibilities

- Typically responsible for many course offerings and a few to a dozen programs of study
- Often exists as a "cost center" in the Chart of Accounts

A program is defined as a **pedagogical track** that students follow in order to attain a credential (e.g., 'degree') in their chosen field of study (e.g. 'major')

- May be associated with a single department or multiple departments (if inter-disciplinary)
- Often does not exist as a "cost center" in the Chart of Accounts
- Includes undergraduate and graduate "standalone" degrees, for example: B.Sc. Chemistry, B.A. History, M.A. Public Health, Certificate in Cyber Security
- Excludes minors and concentrations

Analyses in Program Analytics Dashboard

APS Program Analytics follow **the population of students enrolled in the program** and **the coursework that those students have taken**.

1. **Course Analyses**: Insight into which courses (major requirements, electives, and general education) students in the program were enrolled in
   - Different than the department-level analyses in the APS platform, which provide insight into which courses the department offered
2. **Instructor Analyses**: Insight into which courses students in the selected program were enrolled in, and with which instructors they interacted with through that coursework (major requirements, electives, and general education)

Reconcile APS and Internally Reported Data

Understanding Why Some APS Data Differ from Your Expectations

The APS platform consists of curated analytics built from your institution's student, HR, and finance data. The APS team has endeavored to present your institution's data in an accurate manner that enhances data-informed decision-making.

Common Data Incongruities in APS Platform

Users may see differences in the data presented in their institution's APS platform and other data sources used by the institution. These discrepancies are a result of the methodologies employed, configuration decisions, and other decisions specific to the institution.

"What is the timing of the data snapshot presented in the APS platform?"

Timing of the data snapshot depends on the institution's student information system (SIS).

- *Institutions with PeopleSoft*: The APS platform employs End of Term (EOT) data, since there is no "census date" field in PeopleSoft from which the APS team can extract data and the census date varies by institution. As a result, users will typically see a higher enrollment number in other data sources outside of the platform.
- *Institutions with Banner*: Most metrics in the platform use End of Term (EOT) data. However, enrollment metrics such as class size and fill rate, use Census Data (CD) since Banner has a "census date" field from which the APS team can extract data.

"Why does the APS data look different than the data in our internal IR reports?"

The APS platform reports on the source data by ingesting raw data from the partner's data sources and keeping the data as is, meaning no data transformations are made. In comparison, most internal reports created by the IR office undergo a cleanup and various configurations.

- *Mismatch Between APS and Internal Reports*: The APS team is not privy to the configurations and other changes made by the IR team, so the data in the APS platform and other internal reports may not match.

"What data are excluded from the APS platform?"

Data exclusions in the APS platform are a result of configurations made by the institution and the nature of the type of data presented in the APS platform. The four most common data exclusions are note below.

- *Course-Specific Exclusions*: An institution can configure their data in the APS platform to exclude certain campuses (e.g., study abroad), but these campuses may be included in non-APS reports.
- *Transfer Coursework*: The APS platform never includes transfer coursework.
- *Zero Enrollment Courses*: The APS platform excludes courses with zero enrollment, but these courses may be included in non-APS reports.
- *Non-Gradable Courses*: The APS platform only includes gradable courses, but non-gradable courses like a developmental course may be included in non-APS reports.

Source: Academic Performance Solutions.

"What discrepancies are the result of configuration decisions made by the institution during APS platform implementation?"

There are many configurable elements in the APS platform that are at the discretion of the institution. As such, these configurations affect the way in which data is presented in the APS platform. Below are the most common discrepancies due to configuration decisions.

- *Non-Degree Students*: Students such as this, like a senior enrolled in a course at the institution who has no degree associated with him/her/them, may or may not be included in the data in the APS platform.
- *Dual Enrollment Students*: High school students taking coursework for both high school and college credit may or may be included in data in the APS platform.
- *Secondary Instructors*: The primary instructor is always included in data in the APS platform, but the secondary instructor may or may not. This is configured by the institution, but the default is to only include primary instructors.

"How is the data affected if a student is not associated with a program or coursework?"

Students who are associated with records may not appear in data in the APS platform if they are not associated with either programs or coursework.

- *Students Without Programs*: Students who have a record associated with them but who are not linked to a program of study will not appear as enrolled in a program but may appear as having taken coursework.
- *Students Without Coursework*: Students who have a record associated with them but who do not have any coursework attributed to them will not appear in the data in the APS platform. An example is a student who paid the deposit to enroll at the institution, but never actually enrolled in courses.

"How are courses or programs offered under certain circumstances accounted for in the APS platform?"

Certain data is not collected by the APS Technical team, thus are not included in the APS platform.

- *Courses with Specific Sources of Funding*: Institutions with specific sources of funding, such as public institutions that self-fund courses, may not have these courses appear in their APS platform.
- *Cooperative Programs with Other Institutions*: Institutions that offer courses as part of a joint program, such as nursing, with another institution will have their institution's enrollment on record which would appear in the APS platform. However, the institution does not have enrollment data for the cooperative institution, so that data will not appear in the platform. An institution must have knowledge of their cooperative programs, since these courses are not indicated in the APS platform.

Action Item

- Considering how you use the data, select the most relevant data incongruities to your work
- Copy and paste them into a document, save it, and print it
- Display your printed document near your workspace to keep the information top of mind

Source: Academic Performance Solutions.

Question Posing and Data Use

SKILLS 5&6

Leverage Data Storytelling to Improve Decision-Making

Data storytelling is a method of communicating information that pairs data with visualization and narrative tailored to a particular audience. Effective visualization helps users understand important trends or figures, while the use of narrative creates a connection between people and data. Put simply, storytelling is a more compelling way to present information than looking at a graph without context.

Components of an Effective Story

Before you begin to shape your story, consider your objectives for data use (i.e., the questions you seek to answer) and your audience.

The Right Amount of Information

Information overload occurs when an individual is inundated with a larger volume of information than they can comprehend. Avoid this by considering your audience and what they already know. Only include data that are relevant.

Effective Visuals

Visuals make data more digestible, but only when they are in a suitable format and framed around the information the audience already has.

In the APS platform, all drill-in reports can be viewed as a table, line chart, bar chart, or pie chart. The default visual is what the APS team believes is the most effective way to visualize the data.

Unbiased Context and Why It Matters

"Visualization should be devoid of bias. Even if it is arguing to influence, it should be based upon what the data says–not what you want it to say," writes the Harvard Business Review. Create a narrative that is compelling to your audience, while staying true to the facts. Consider how the data points relate to one another and how they are relevant to your audience. For example, how do your findings from the data impact the institution or academic unit in question?

> "Just as with any good story, a data tale has to have a beginning, a middle, and an end. It needs to be presented without bias and with the proper empathy and context so business users can absorb and leverage the insights for more intelligent decision-making."
>
> Ideas Made to Matter, MIT Sloan School of Management

Source: Stackpole, B. (2020, May 20). The next chapter in analytics: Data storytelling. Retrieved from https://mitsloan.mit.edu/ideas-made-to-matter/next-chapter-analytics-data-storytelling; Stikeleather, J. (2018, February 27). How to Tell a Story with Data. Harvard Business Review. https://hbr.org/2013/04/how-to-tell-a-story-with-data
;

Data Storytelling Example

Introduction

- **Scenario**: In this example, the Department Chair of the Political Science Department wishes to understand if her department requires additional faculty. The Department Chair is named Katherine.
- **Question/Purpose of Data Use**: Does the Political Science Department need additional faculty to support student demand?
- **Audience**: If Katherine concludes that the department requires additional faculty, she must present her case to the Dean of the college. The Dean understands the college's intricacies and nuances, the state of other departments in their purview, and the state of the institution's budget.

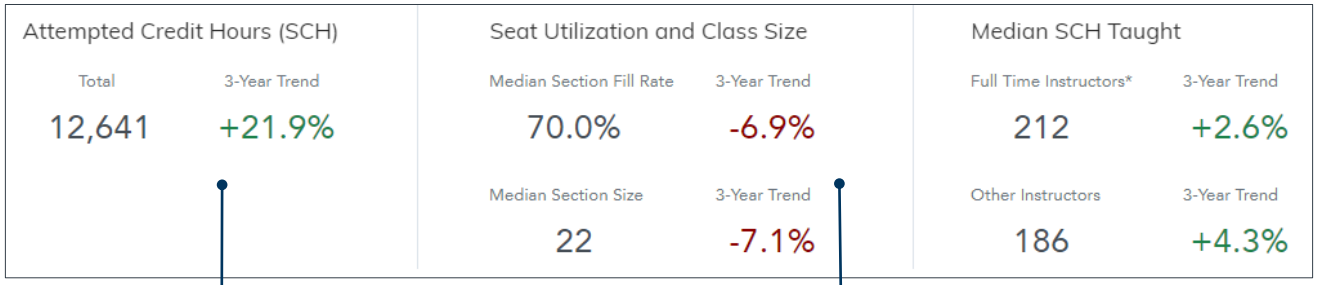
Analysis

To investigate her question, Katherine uses the Instructional Staff Capacity Workflow tab on the APS Workflows dashboard in the APS platform. She chooses to use this tab because it provides an effective summary of the department's student demand, course/section efficiencies, and instructional capacity utilization.

Findings and Interpretations

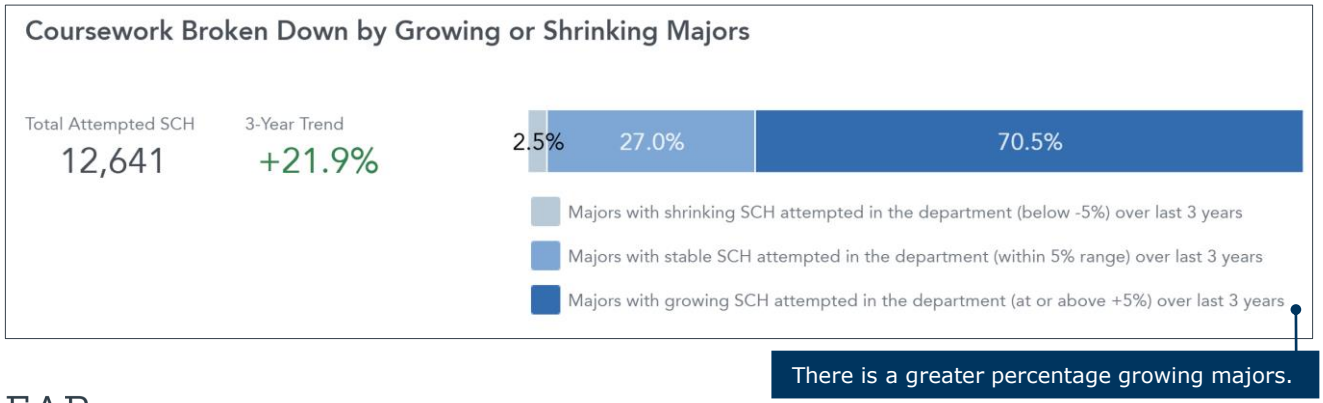
The Instructional Staff Capacity Workflow tab is organized into four sections. In this part of the toolkit, Katherine's findings and interpretations are broken down step-by-step.

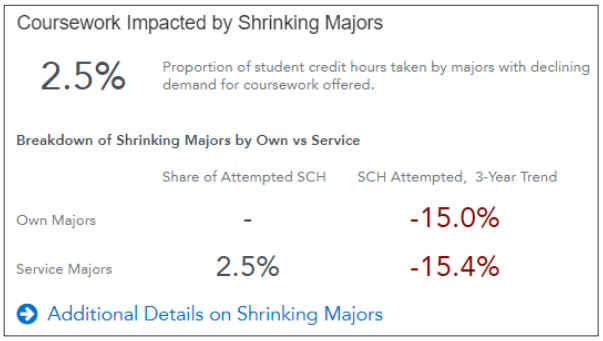
1 Summary Trends

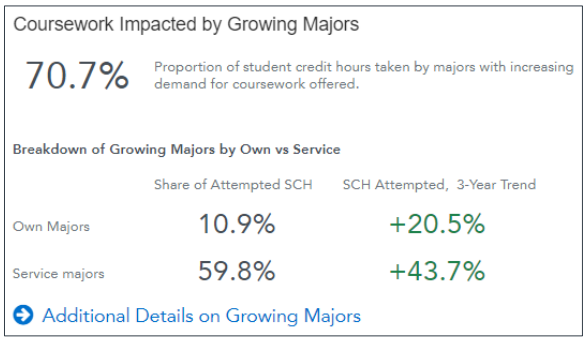


Interpretation: *"The department is growing. The median section fill rate and section size trends indicate there may be opportunities to consolidate sections and reallocate instructional capacity from low-fill sections to areas with growing student demand."*

2 Attempted Student Credit Hours (SCH): How is Course Demand Changing?



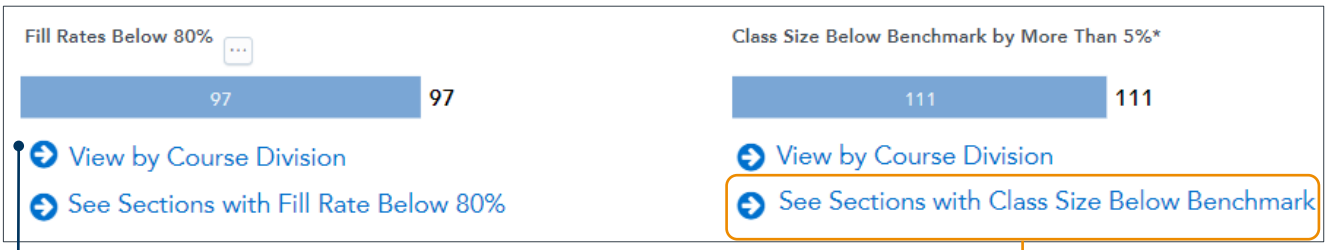




- Shrinking majors contribute a relatively small proportion of SCH in the department and the amount of coursework attempted by shrinking majors has decreased, but not substantially.
- Most SCH (70.7%) in the department are from growing majors, and within that group, by service majors.
- The SCH Attempted 3-Year Trends of growing majors are higher than those of the shrinking majors, which contextualizes the overall +21.9% Attempted SCH, 3-Year Trend (on previous page) in the department.

Interpretation: *"The department primarily serves growing majors. In the APS platform, growing majors are defined as majors with an average annual change in SCH attempted in the selected department at or above 5% over the last three academic years. The department is growing and may require additional resources to support student demand."*

3 Seat Utilization and Class Size: How Efficient Are Current Course Offerings?

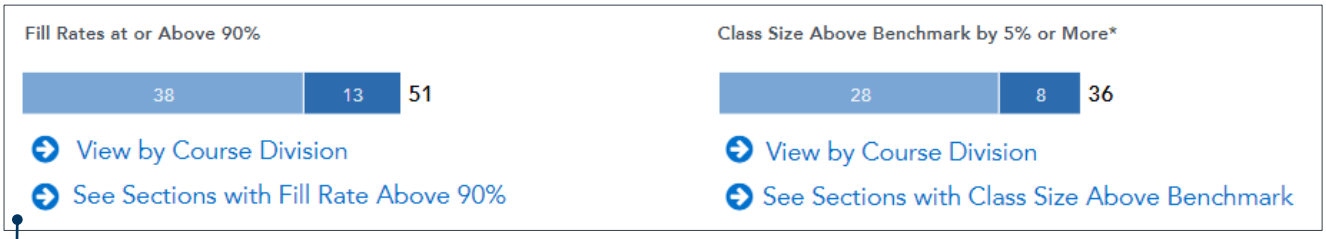


The key above this report in the dashboard indicates the light blue color represents sections for Lower Priority Review. The department's enrolment in sections with fill rates below 80% and class sizes below benchmark by 5% or more, is made up of less than 20% of majors with changing demand.

See Sections with Class Size ... » Drill

Course Code	Course Ref N	Course Name	Course Type	Course Division	Course Level	Siz	% Delta from Coh	Class Capacity	Fill Rate	# of
GEOG300	12705	Masked GEOG300	Lecture/Lab	Upper Division	300-Level	5	-16.0%	25	100.0%	
GEOG321	30347	Masked GEOG321	Lecture	Upper Division	300-Level	5	-16.0%	30	83.3%	
POLS331	13036	Masked POLS331	Lecture	Upper Division	300-Level	5	-16.0%	35	71.4%	
GEOG451	13130	Masked GEOG451	Lecture	Upper Division	400-Level	8	-12.5%	30	60.0%	
POLS421	24094	Masked POLS421	Lecture	Upper Division	400-Level	8	-12.5%	30	60.0%	
GEOG308	30344	Masked GEOG308	Lecture	Upper Division	300-Level	6	-11.5%	30	86.7%	
POLS326W	25980	Masked POLS326W	Lecture	Upper Division	300-Level	6	-11.5%	35	74.3%	
POLS331	28428	Masked POLS331	Lecture	Upper Division	300-Level	7	-7.4%	30	90.0%	
GEOG402	13652	Masked GEOG402	Lecture	Upper Division	400-Level	9	-6.6%	25	76.0%	
	23666	Masked GEOG402	Lecture	Upper Division	400-Level	9	-6.6%	20	95.0%	
GEOG408	30391	Masked GEOG408	Lecture	Upper Division	400-Level	9	-6.6%	25	76.0%	

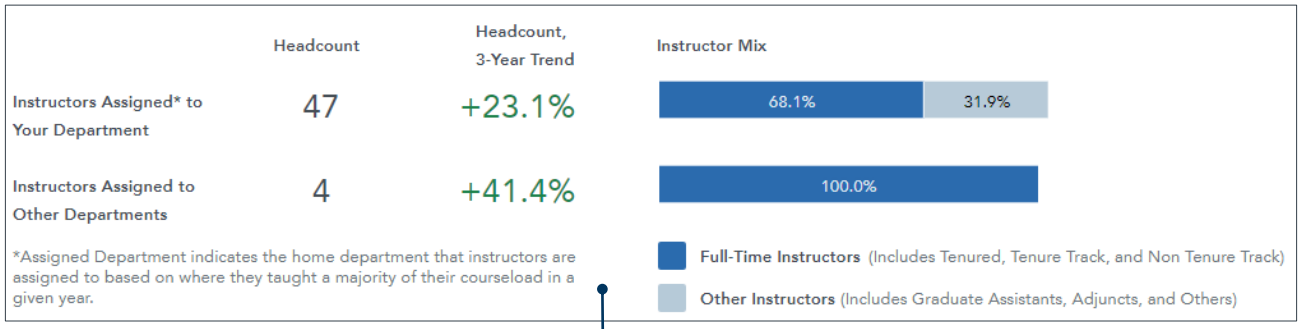
The *% Delta from Cohort* metric in the report shows that the largest differences in class size from the benchmark is present in Upper Division courses.



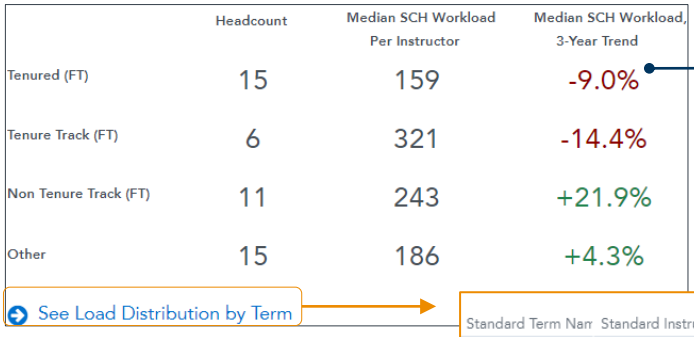
In these reports on the dashboard, Higher Priority shading represents sections above recommended range consisting of only growing majors. There are 13 potential opportunities to expand classes with fill rates at or above 90% and 8 opportunities to expand class sizes above benchmark by 5% or more.

***Interpretation**: "While there are more section consolidation opportunities than expansion opportunities in the department, the expansion opportunities will impact growing majors. These students are attempting a growing number of SCH in the department. Additionally, the % Delta from Cohort metric indicates that the largest differences in class size from the benchmark are present in Upper Division courses. This supports the need for a new faculty line for Lower Division courses, because there are not large differences in these courses from the benchmark."*

4 Median SCH Taught: Do You Have The Right Instructional Capacity to Meet Course Demand?



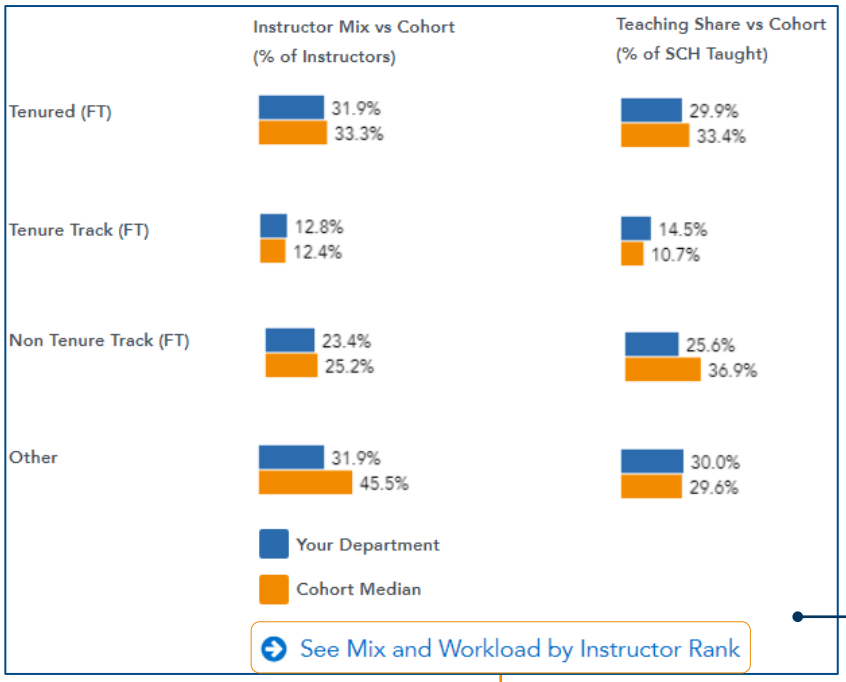
There are 47 instructors assigned to the department, consisting mostly of full-time instructors (68.1%). There are 4 full-time instructors teaching in the department who don't teach most of the coursework in the department.



The median SCH workload of Tenured and Tenure Track instructors has decreased over the last three years whereas Non-Tenure Track and Other has increased in the department.

Standard Term Nam	Standard Instructor Type	Non Tenure Trac	Not Benchmark	Tenured	Tenure Trac
Fall	% of Instructors Teaching 0 - 5.9 Credit Hour Lo	10.3%	12.8%	7.7%	2.6%
	% of Instructors Teaching 6 - 8.9 Credit Hour Lo	5.1%	17.9%	12.8%	5.1%
	% of Instructors Teaching 9 - 11.9 Credit Hour L	2.6%	2.6%	2.6%	2.6%
	% of Instructors Teaching 12+ Credit Hour Load	5.1%	2.6%	5.1%	2.6%
Spring	% of Instructors Teaching 0 - 5.9 Credit Hour Lo	5.6%	16.7%	5.6%	-
	% of Instructors Teaching 6 - 8.9 Credit Hour Lo	5.6%	11.1%	5.6%	2.8%
	% of Instructors Teaching 9 - 11.9 Credit Hour L	8.3%	5.6%	2.8%	5.6%
	% of Instructors Teaching 12+ Credit Hour Load	5.6%	-	13.9%	5.6%

The *See Load Distribution by Term* drilldown report shows the percentage of instructors teaching within specific credit hour groupings. The department's standard load is 9, so 15.4% (10.3% + 5.1%) are teaching below the standard.



Although the median SCH workload of Tenured and Tenure Track instructors has decreased, their teaching shares are now close to those of the benchmarking cohort.

Standard Instructor Type	Instructor Rank	Headcount	% of Instructors Ass	Total SCH Tau	% of Total SCH Taugh	Median SCH Tau	3-Yr Trend, Median S
Non Tenure Track	Other	11	23.4%	3,156	25.6%	201.0	+31.1%
	Rollup	**11**	**23.4%**	**3,156**	**25.6%**	**201.0**	**+31.1%**
Not Benchmarked	Instructor	14	29.8%	3,372	27.4%	172.5	+0.4%
	Other	1	2.1%	324	2.6%	324.0	-
	Rollup	**15**	**31.9%**	**3,696**	**30.0%**	**186.0**	**+4.3%**
Tenured	Other	15	31.9%	3,678	29.9%	105.0	-16.3%
	Rollup	**15**	**31.9%**	**3,678**	**29.9%**	**105.0**	**-16.3%**
Tenure Track	Other	6	12.8%	1,791	14.5%	321.0	-14.4%
	Rollup	**6**	**12.8%**	**1,791**	**14.5%**	**321.0**	**-14.4%**
Rollup		**47**	**100.0%**	**12,321**	**100.0%**	**183.0**	**+3.4%**

Interpretation: *"The workload of Non-Tenured and Other instructors has increased over the last three years, whereas full-time workload has decreased. This indicates an opportunity to better balance workload to be more in line with the department's expectations. However, comparing median SCH workload to the benchmarking cohort – full-time workload is now closer to the benchmark."*

Conclusion

Katherine concludes that, given her analysis, there is need for an additional faculty line to support her growing department. Student demand is increasing, and many high-fill sections serve growing majors. Additionally, while full-time workload has declined it is more in line with that of our benchmarking cohort, which consists of similar institutions.

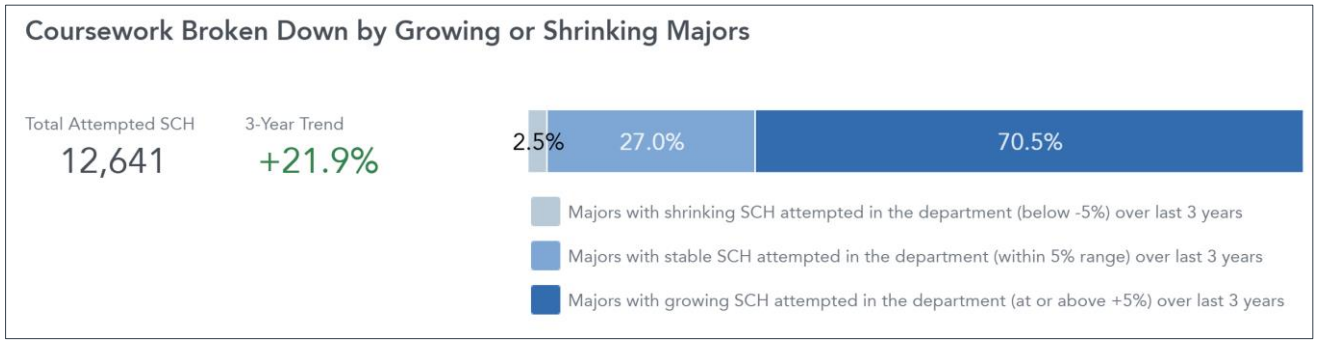
Continues on next page

Data and Narrative to Present to Dean

This section of the document is written from Katherine's perspective.

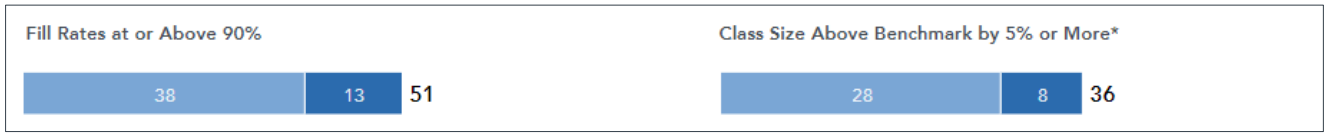
I set out to determine if my Political Science Department needs an additional faculty line to support student demand. I performed an analysis in the APS platform using the Instructional Staff Capacity Workflow tab. My investigation revealed three important points:

1. **Course Demand**: Overall, it is trending positively for the department. More student credit hours (SCH) are coming from growing majors, indicating the SCH growth may accelerate in the future.



2. **Course Efficiencies**: The department has 51 sections with fill rates greater than 90% and 36 sections with fill rates greater than 5% or more compared to the benchmark. This means students may be unable to enroll in courses they need to complete for graduation.

   In addition to the data, I've heard grumblings from faculty in Lower Division courses that their sections are very full, and they are having difficulty engaging with the growing number of students. Of course, Lower Division courses often serve our first- and second-year students whose early university experiences will greatly impact their paths to their degrees.



3. **Instructional Capacity**: We have 47 instructors assigned to the department, 68.1% of which are full-time. In comparison to non-tenure and other instructors, full-time workload has decreased. This indicates an opportunity to better balance workload to be more in line with the department's expectations. However, it is worth noting that when we compare median SCH workload to the benchmarking cohort, full-time workload is now closer to the benchmark. It may be the case that we need to re-assess our workload expectations to better reflect those of similar institutions, like ones in our benchmarking cohort.

Given my findings, I believe the department requires an additional faculty line to better serve growing students. The analysis also piqued my curiosity as to how, given the current state of the institution's budget and the need to be resourceful, this new faculty line can serve not only my department but another department. There may be opportunity to further dive into the data to identify cross-listed courses that serve both our own and service majors. After considering many different factors, we may be able to align curriculum with a service department to maximize the potential new faculty line's capacity.

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