



GRAY
DECISION INTELLIGENCE

Program Evaluation System

Overview of Economics and Outcomes Module

While most colleges and universities are not in the business of making money, understanding which programs produce margin and how much is vital to ensuring that the institution generates enough funds to sustain its mission.

Most non-profit higher education institutions do not know the costs, revenues, or margins of their academic programs. As a result, institutional leaders must make programmatic decisions without a clear understanding of the likely effects on their college's financials.

Potential misunderstandings can hurt financial performance by closing programs only to find that the lost revenue exceeds the cost savings or by growing programs with high incremental costs but average tuition. In addition, actions that could improve program and course economics may be overlooked.

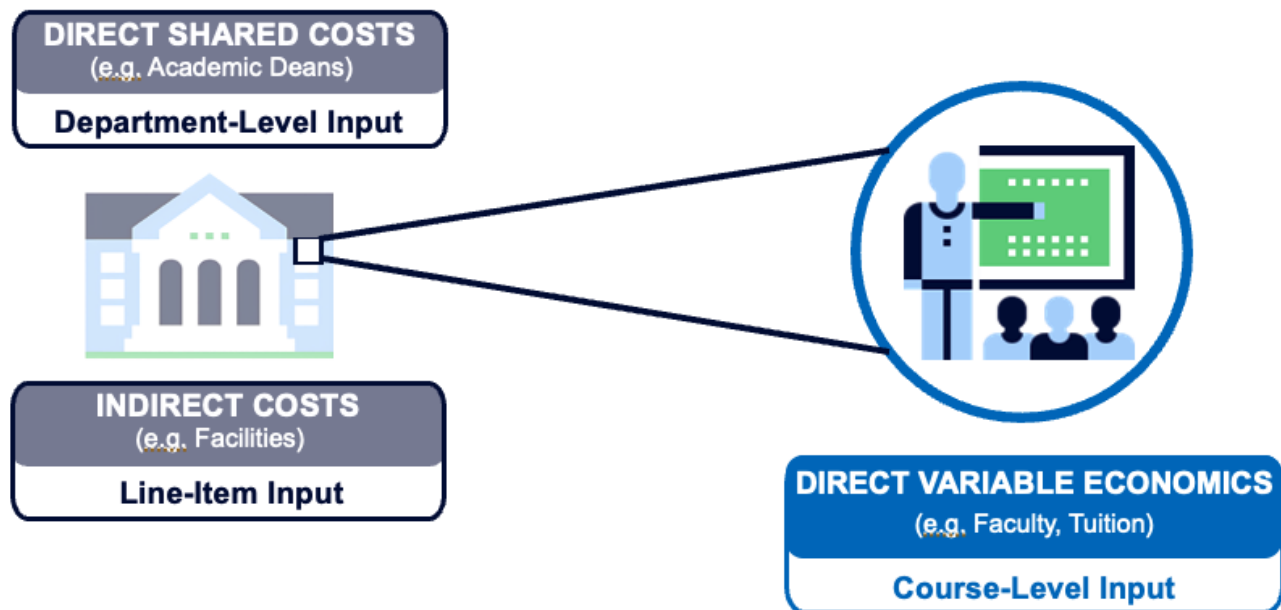
Gray DI addresses this issue by developing a system to estimate and track profitability by program and course. This project provides a much clearer understanding of the web of cross-subsidies that exist in most universities. Large programs are often profit centers that pay for smaller, more specialized programs. "Chalk and Talk" courses and programs often subsidize lab sciences. Moreover, the much-maligned Liberal Arts programs may generate profits that are consumed by Engineering and Health Care programs, which require more expensive professors and equipment.

Gray DI's academic economics methodology calculates margin data at the course level. This data enables colleges to find opportunities to improve curricular efficiency – and financial performance – independent of changes to programs.

With a clear understanding of the economics of individual programs and courses, you will be better able to evaluate its program portfolio and realize the following objectives:

- Establish metrics and standards for program contribution
 - Revenue by course and program
 - Direct instructional costs by course and program
 - Contribution margin percentages and dollars by program
- Make better-informed decisions on programs to grow, fix, or stop
- Identify critical levers to improve program contribution (e.g., course scheduling)
- Enable better-informed decisions about course offerings, schedules, and staffing
- Identify opportunities to reduce cost by department, program, and course while minimizing disruption to the institution and its mission

Program economics focuses on direct variable economics: the revenue and costs associated with classroom instruction. Gray recommends an iterative approach to building the financial model, starting with direct variable costs and revenue. As an option, later projects could then allocate direct fixed costs and overhead. This approach is illustrated and described below.



Direct, Variable Economics


We suggest starting with the costs and revenues that will be directly affected by program-level decisions. Typically, the core elements are faculty compensation and benefits, student tuition and fees, and institutional grants. Depending on the institution's underlying cost structure, these might also include some marketing and admissions costs, course- or program-specific student support (e.g., tutoring), and course-specific materials and activities. With this information you could:

- Identify contribution-positive programs to grow
- Identify unprofitable programs that need to be fixed or stopped
- Find critical levers (e.g., retention) to improve program contribution
- Set targets for unit cost and revenue (i.e., revenue per student credit hour)

Building and validating the financial model will require a combination of participative process, data evaluation and cleaning, database development, cost and revenue modeling, effective visualization, and communication of findings. This plan is outlined below.

- **Run Kick-off Meeting:** Gray DI will prepare the agenda for and facilitate a kick-off session for your team. In the session we will:
 - Refine project objectives
 - Review the proposed timeline
 - Agree on tasks and responsibilities
 - Schedule milestone meetings for the project
- **Identify and Define Data:** We will work with your finance, operations, and IT managers to identify the correct sources for relevant data on faculty, students, courses, and other program-related costs.
 - Gray will provide standard data requests for each type of data (see example below).
 - We will review the overall requests and fields with your team to clarify the data definitions. Then, as needed, we will modify the requests to align with your systems.
 - To protect the privacy of personal information, we will agree on a hashing process to disguise student and faculty IDs before the data is sent to Gray DI.

Illustrative Student Data Request

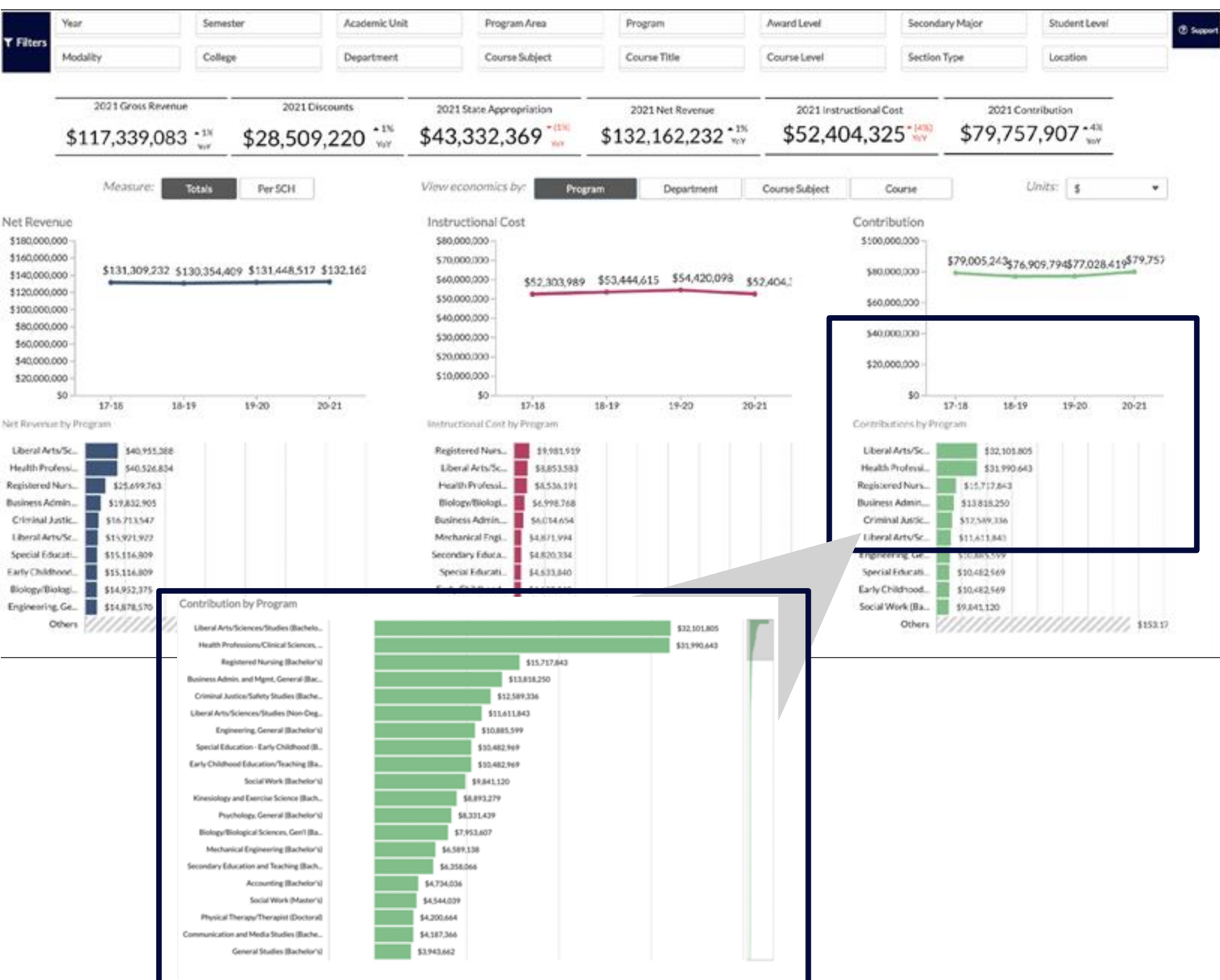
Instructions Include data for the most recent 6 Fiscal Years Hash all student IDs and personnel IDs; save ID crosswalks internally For documentation purposes, please provide the code/queries used to generate each file in a text file, and note the system being used For future year updates, please plan to provide the same file name structure, including tab names. For instance, "Course Data 2022", "Course Data 2023", etc. Please match the field names as Gray has provided, formatted in all capital letters with underscores instead of spaces between words
Files Requested Course Data Personnel Link Student Link Student Enrollment Information Student Charges and Discounts Personnel Compensation Departmental Expense Organizational Table
Additional Information  You will see a key symbol throughout the data request. This symbol indicates that the noted fields will be used to link different files. The indicated fields must match exactly across files for the system to be built. If any of the information requested is easier to provide in more files than outlined, the key fields must be included in all files.

- **Collect and Clean Data:** Gray will provide a secure server to receive your data. We will work with your team to ensure the downloads are complete and correct.
- **Load Data:** Gray will load the data into your custom instance of PES Economics. Then, working closely with your data preparers, Gray will validate and clean the data. You will have access to PES Economics for the duration of your subscription term.
- **Conduct Reviews:** We will meet with your team to review and refine the data and analysis.
 - Data Preparer Reviews: We will conduct several calls (typically 3-5) with your data preparer team to review and refine the data, discuss anomalies and how to handle them, and generally ensure that the financial model provides an accurate view of the institution's program and course economics.
 - Senior-Team Reviews: We will conduct one or two calls with selected members of the institution's senior leadership to:
 - Explain the financial model and how to access it
 - Review highlights of the model – at the institution, program, and course levels – to develop initial findings and identify any remaining data issues
 - Discuss implications of the model and how best to share and use it
- **Share Access to PES Economics, and Train Users:** Gray will start sharing access to PES Economics with your data preparers during the Data Preparer Reviews so that Gray DI and your team can work together to identify and fix any issues. Once the data is reasonably clean and validated, Gray DI will share access with selected members of your senior team so that they can explore the financial model in its not-quite-final form and learn how to access and use the system.
- **Academic Economics Benchmarking Consortium:** At the conclusion of this work, Gray DI invites you to join the Academic Economics Benchmarking Consortium that we are developing. Institutions in the consortium will agree to share data (without identification) to create an economic benchmark database for use by members. This data will enable schools to compare course and program productivity, faculty costs and credit hour production, and other factors.
- **Provide Ongoing Support:** Gray DI's Customer Support Hub is available 24/7 on our website, and our Customer Success team hosts bi-monthly office hours to answer questions and discuss new features or use cases. We provide a limited amount of coaching to help your users get the most value from our systems. For example, on request, we will walk them through how to pull custom data and reports. We also answer questions about data interpretation. We have also reviewed and commented on draft analyses using data from these systems. This service is intended to support your use of Gray DI's systems but is not a substitute for a consulting engagement. Therefore, Gray DI reserves the right, at Gray DI's sole discretion, to limit the amount of coaching provided.

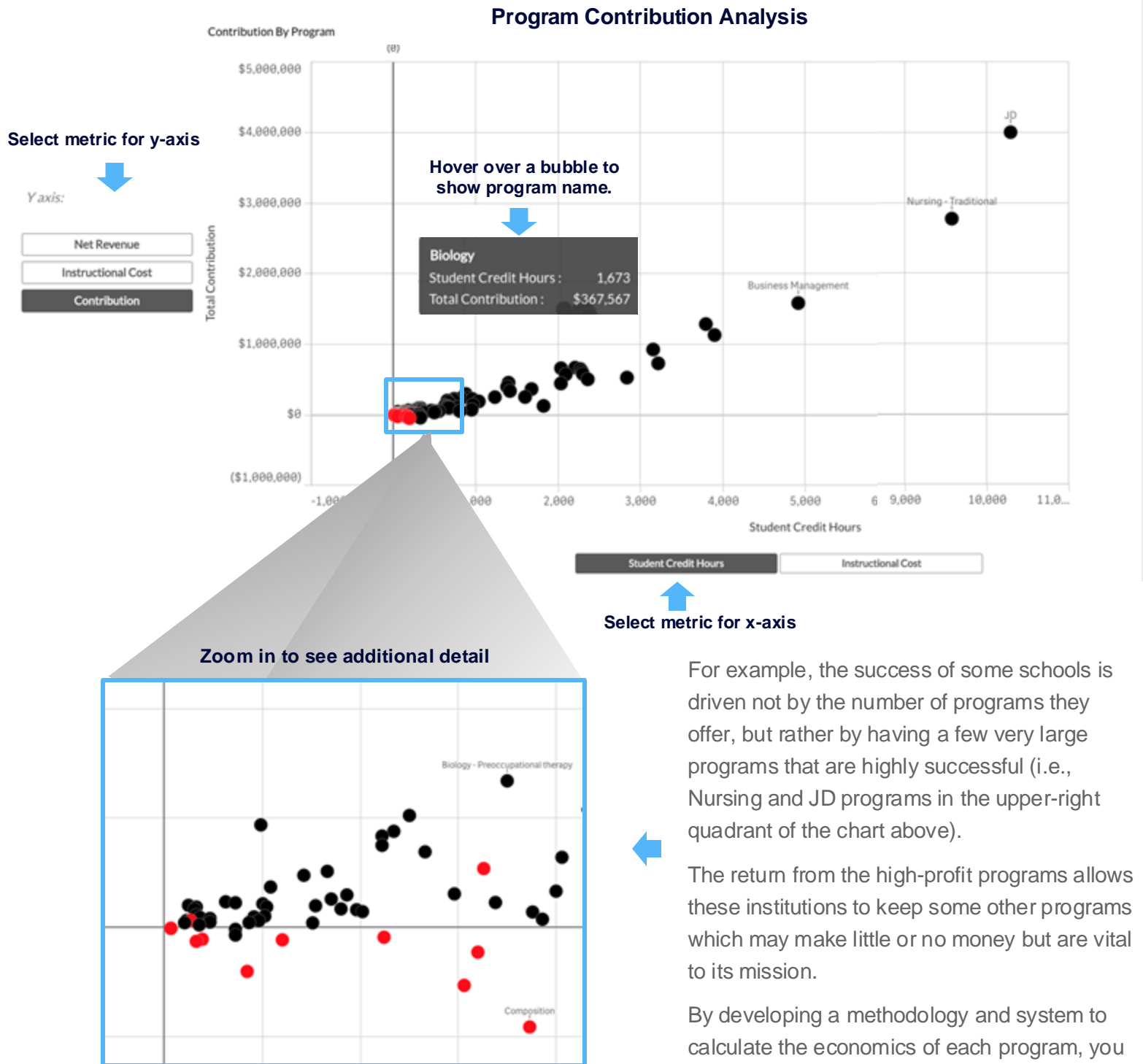
PES Economics provides summary financials for all programs, which can be used to establish target contribution levels and to identify over- and under-performing programs.

Summary data includes:

- Three-year financial performance
- Department, program, course subject, and course totals
- Totals and per student credit hour (SCH)

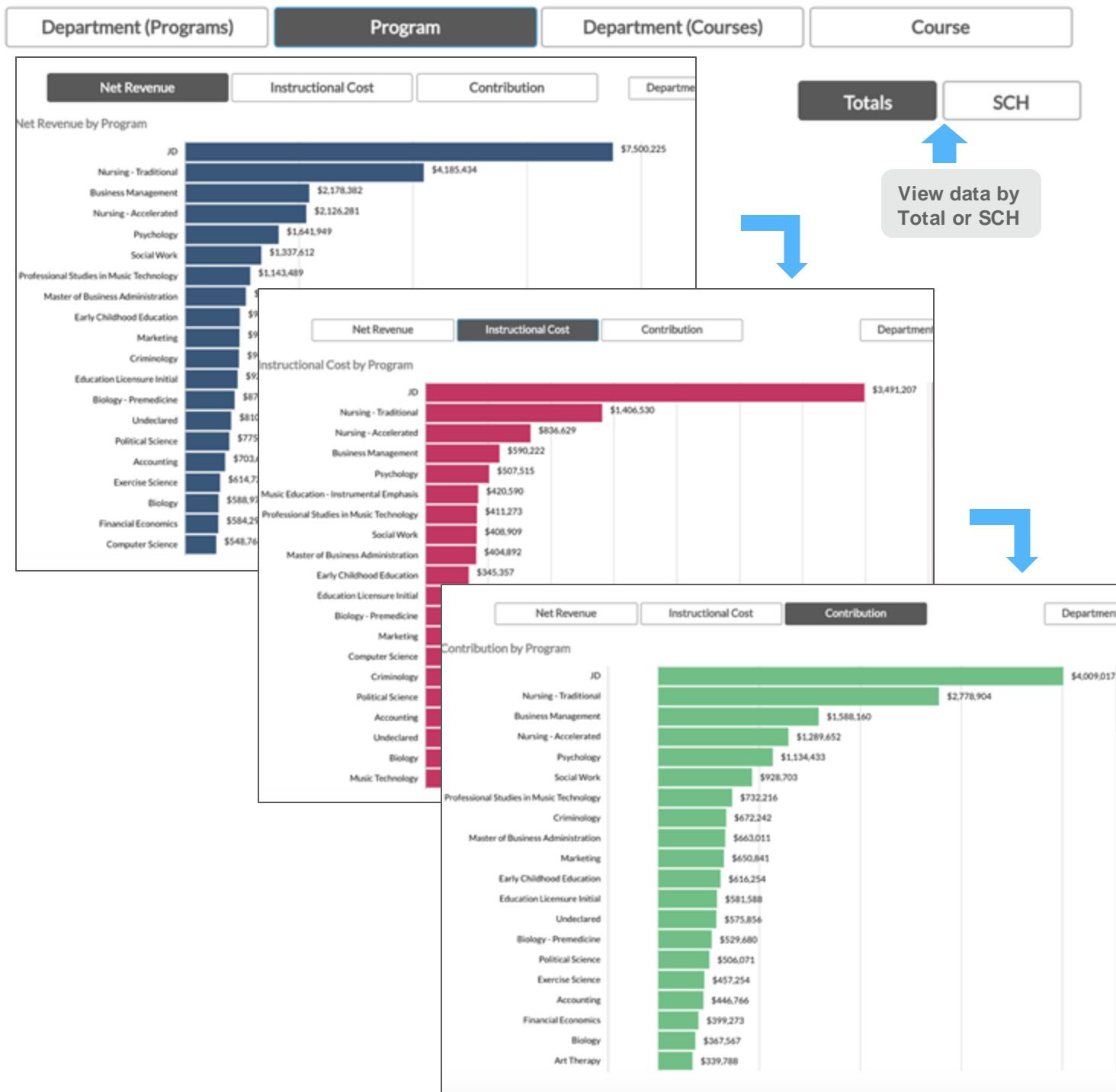


Gray DI's robust BI platform allows users to create custom data views in seconds to analyze program portfolio economics. The example below maps program contribution against program size (student credit hours).



Ranking reports let users quickly compare programs to see which generate the most revenue, which are the most expensive to teach, and which produce the greatest margins.

Program Ranking Reports



In addition to summary views, PES Economics provides detailed financial data for each program. The data include program totals and per Student Credit Hour (SCH) metrics. Each metric is coded to reflect its percentile rank among all programs offered at the school.

In the example below, the program's net revenue per SCH is \$352, below average (in the 21st percentile). On the other hand, its cost per SCH (\$118) is among the 11% of programs with the lowest cost. As a result, contribution per credit hour (\$234) is above average at this school, ranking in the 60th percentile.

Filtering to display program totals (instead of the SCH metrics shown below), would show that because the program is very large, the program's overall contribution (\$2.4 million) ranks in the top 6% of all programs at this institution.

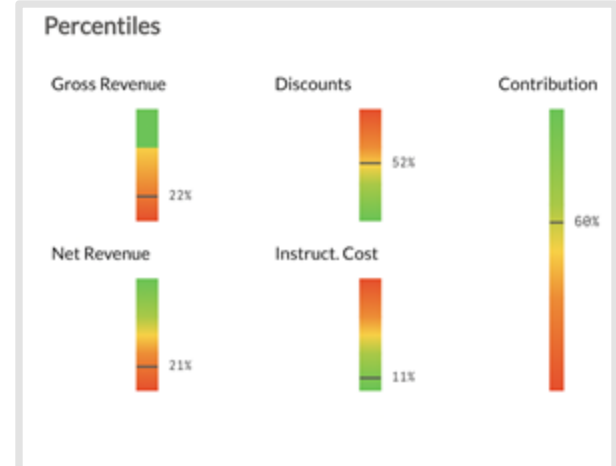
Filters create custom views for:

- Year
- Semester
- Award Level
- Program
- Department
- Course

Percentiles provide context for each metric

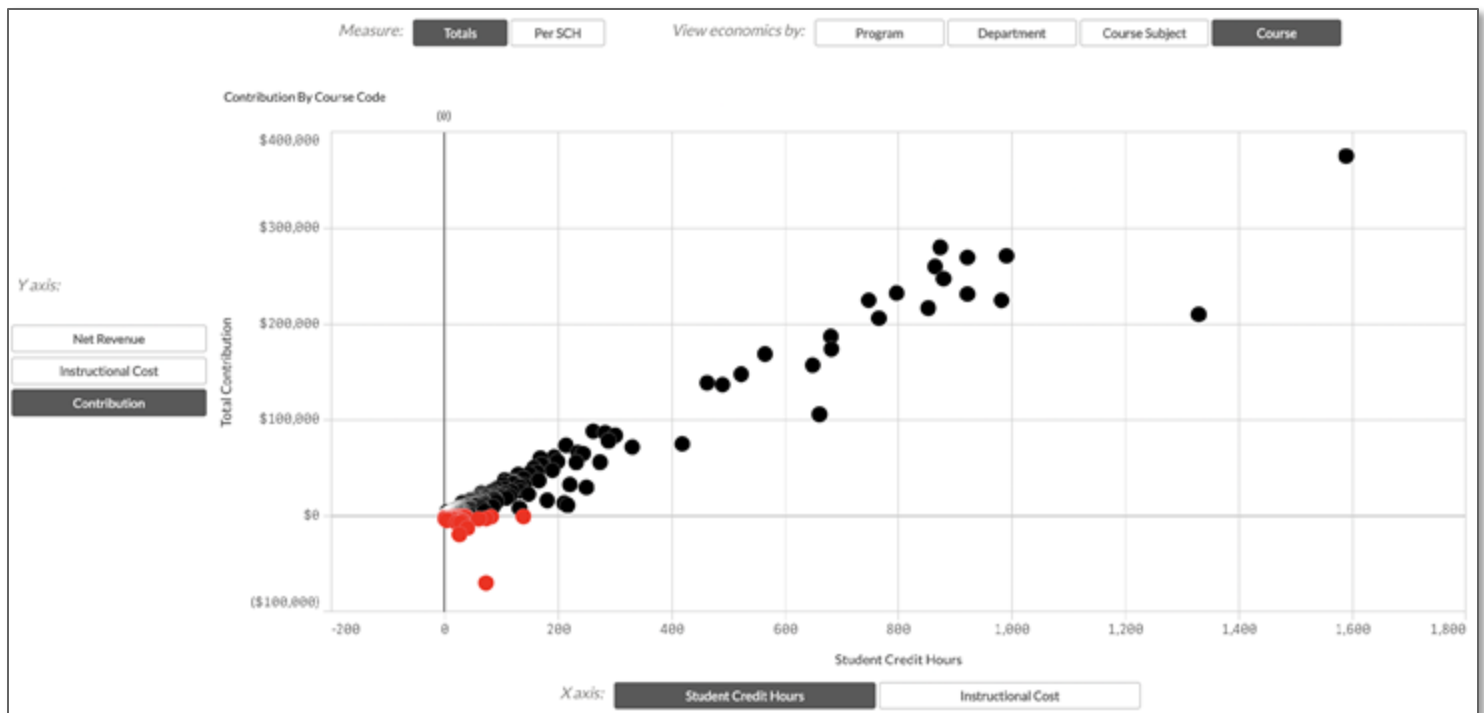
View data by Total or SCH

Program Scorecard: Psychology



Historic data shows trends over time

The overall results for the program are the sum of the revenue, costs, and contribution for each course taken by students in this major. In effect, this means that program economics are the result of course level economics. Many of the insights and opportunities for improvement in program economics will start at the course level. To enable this detailed understanding, PES Economics also displays revenues, costs, and contribution for each of the courses taken by students in the major. As an example, the scatter below shows courses by contribution and student credit hours. Even a program as positive as Psychology has students in courses that are negatively affecting the institutions economics. Additional tables allow for users to drill down into those courses and the sections taught within them.



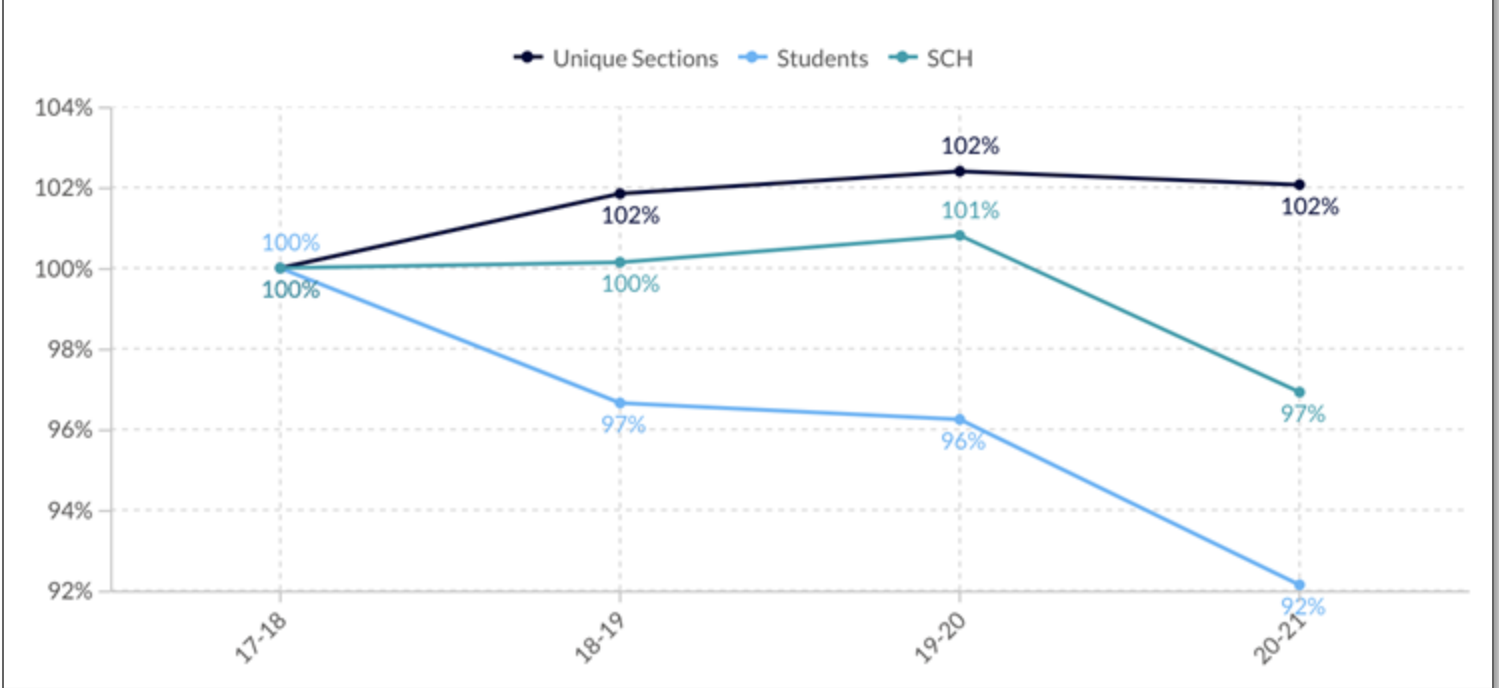
Course Detail: Psychology Program

Excel
Download
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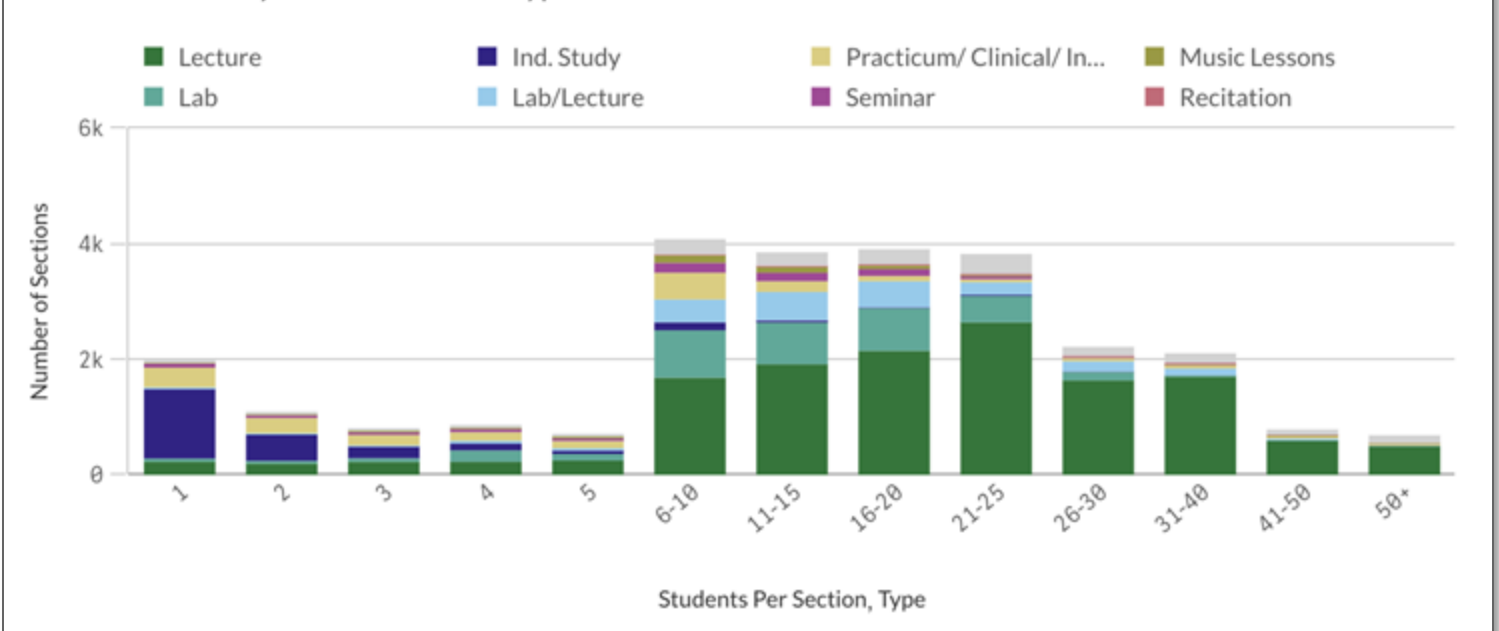
Course Code	Students	Student Credit Hours	Revenue SCH	Cost SCH	Contribution SCH
SOSCI220	47	188	\$444	\$321	\$122
PSYCH370	42	168	\$441	\$141	\$300
PSYCH410	39	156	\$427	\$127	\$300
UC410	37	111	\$440	\$57	\$382
UC150	37	111	\$410	\$42	\$367
PSYCH200	34	34	\$425	\$32	\$394
PSYCH320	34	136	\$367	\$35	\$332
SOSCI210	32	128	\$426	\$70	\$356
PSYCH350	32	128	\$446	\$119	\$327
PSYCH330	31	124	\$391	\$99	\$291
PSYCH300	29	29	\$447	\$170	\$278
ASL110	27	108	\$476	\$72	\$404
PSYCH310	27	108	\$422	\$31	\$391
UC120	26	81	\$432	\$80	\$353
UC200	24	75	\$471	\$43	\$428
UC220	24	72	\$407	\$83	\$324
PSYCH340	22	88	\$407	\$37	\$370
UC310	21	63	\$453	\$156	\$297
PSYCH120	20	80	\$449	\$74	\$375
ASL111	19	76	\$384	\$116	\$267

Beneath courses are the individual sections that are taught. While it is important to understand the economics of the courses and its sections, looking at counts and sizes is equally important when finding where to be more efficient. The line and bar charts below show different ways to look at how sections counts have trended with student counts and student credit hour totals, and the distribution of section sizes by section type. While there are reasons for running some low enrollment courses, it is important to pay attention to the distribution and make sure it is not trending in the wrong direction.

Instructional Trends (2017-18=100%)



Section Count By Section Size And Type



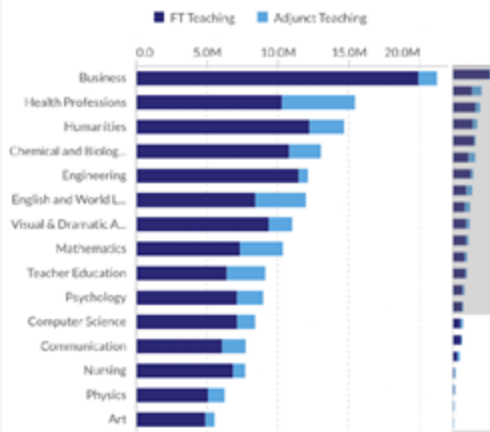
Deliverables: Faculty Analysis

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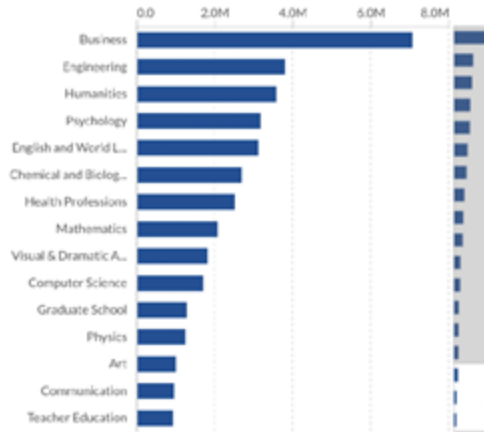
Faculty pay and workloads are critical drivers to a program and departments economics. The focus of the system is on instructional costs, but you must also look at where all the academic expenses are being spent across departments. In the examples below we can see how expenses are spent between teaching, release, and unassigned. We can also see how those teaching expenses are split between full-time faculty and adjuncts. This can also be shown as a percentages. This information can help identify where faculty might be underloaded, but it is also a way of being able to see where faculty might be overloaded. This can be seen in the table, using the column further to the right. The department on the top of the list include faculty doing more than they were expected to do.

Measure: Totals Percentage

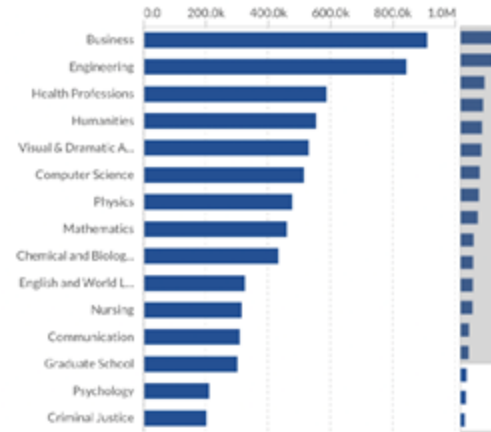
Teaching Dollars By Course Department



Release Dollars By Faculty Department



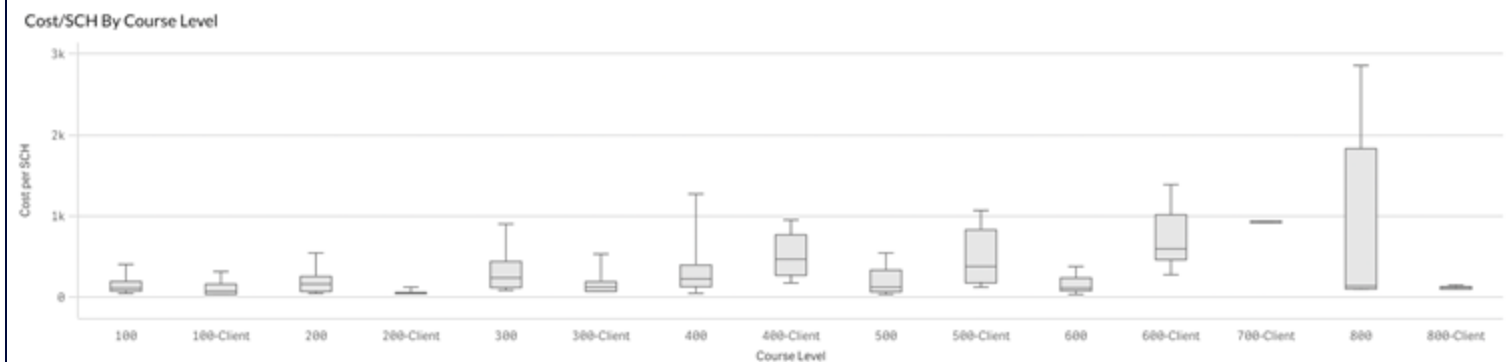
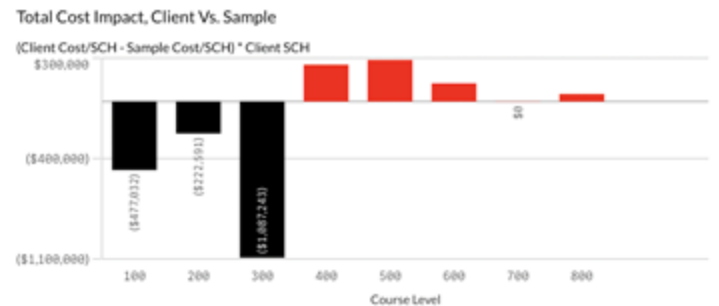
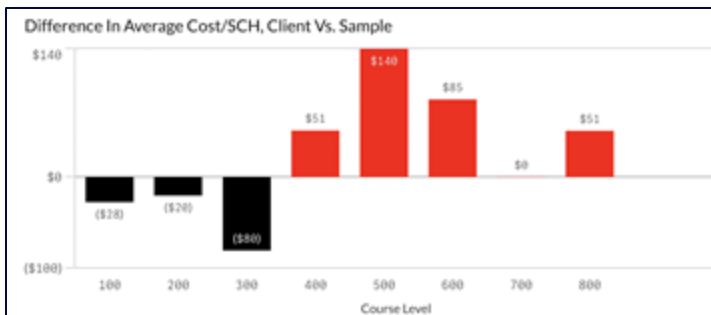
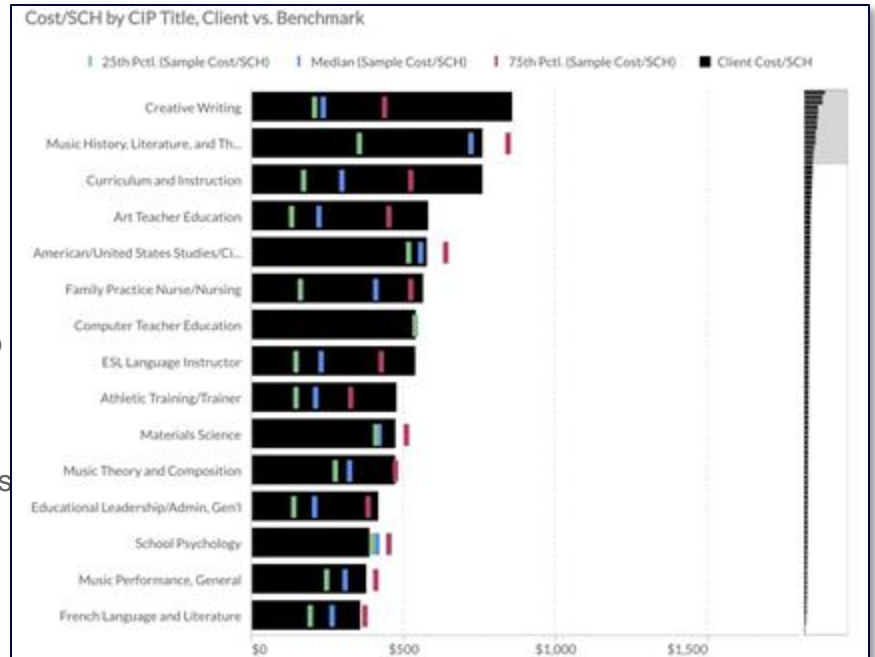
Unallocated Dollars By Faculty Department



Instructor Department	Course Work Units	Release Work Units	Expected Work Units	Over/Under in Work Units
Business	1,073	255	1,182	-145.8
Psychology	600	101	564	-137.0
Communication	492	24	414	-101.7
Art	307	22	252	-77.4
Chemical and Biological Sciences	640	81	660	-60.9
Engineering	666	176	786	-56.9
Mathematics	510	66	552	-23.2
English and World Languages	545	147	684	-8.5
Computer Science	434	52	480	-6.2
Physics	293	26	324	4.9
Criminal Justice	233	18	270	19.3
Nursing	563	17	618	38.8

PES Economics Benchmarking allows academic institutions to compare internal financial performance across departments, programs, and courses within the school and with other institutions. Gray DI's benchmarking data includes cost, revenue, and margins for academic departments, programs, and courses. Users can view totals or drill down to see performance by Student Credit Hour. Benchmarking helps colleges and universities create metrics and targets, highlight best practices, and identify areas for improvement.

- View metrics on revenue, cost, margins, class sizes, and more
- Compare results by department, program, course, and course level
- Evaluate aggregated totals and metrics per Student Credit Hour
- Adjust for Cost of Labor or Credits to Degree
- Create custom data tables to drill down on specific metrics or programs
- Download data to Excel for presentations or further analysis



One of the best ways to increase the economics of an institution is to focus on student retention. This is an equally important topic when assessing student equity. Since many of the economic data sources include academic data, Gray DI's system also provides information on academic outcomes. In the examples below, we look at DFW rates by ethnicity and gender, and DFW rates by department. Charts like these help identify issues in particular student populations and subject areas. As with every other analysis, each area can be drilled down on to see what courses a particular gender or ethnicity might be struggling with or what might be driving the higher rates within a given department or course subject.

