



PSEO Coalition

PSEO Data Explorer: Step-by-step Guide When Analyzing Earnings

Chapter 3

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Analysis Example: Earnings

Students and parents may be focused on assessing job demand for the student’s degree program of interest, long-term career path, and geographic location of jobs post-graduation. Below are some examples of questions students and parents might want to answer using the PSEO tool and data examples that can help answer them.

Audience	Question	Data Elements in PSEO
Parents and Students	1. If I/my child pursues a degree in program X at college Y, will they earn enough to support themselves?	Annual Earnings (<i>%percent</i>) by Program (<i>detailed</i>)
Parents and Students	2. Will I/my child find employment if they study in degree program, X?	Program (<i>general</i>) to Industry Flows (<i>% share</i>)

Question #1:

If I/my child pursues a degree in program X at college Y, will they earn enough to support themselves?

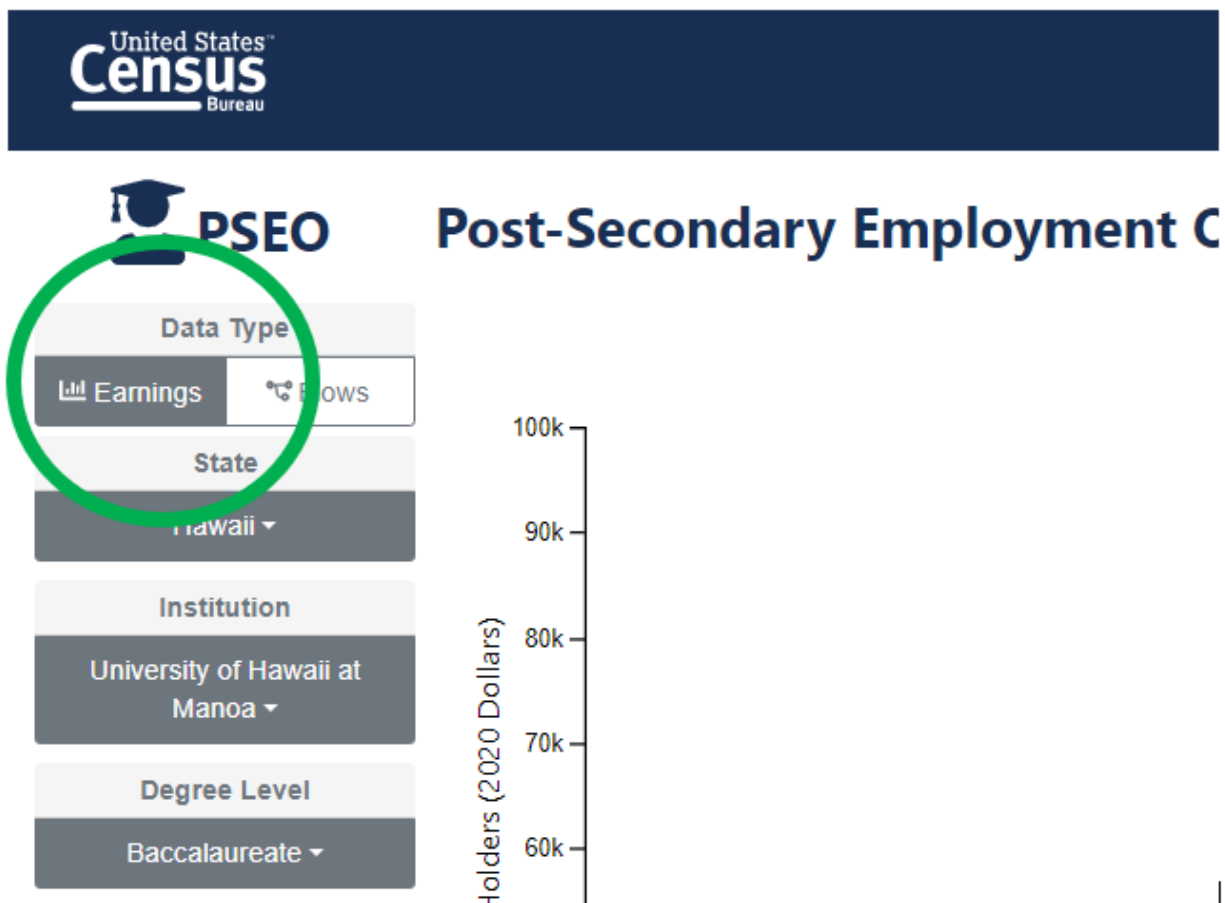
Displaying the data, Summary:

Select: Data Type = “Earnings”; State, Institution, and Degree level; Program = “All Instructional Programs; Engineering; Liberal Arts and Sciences, General Studies and Humanities”; and Years-Postgrad filter = “5”

→ Note that you will only be able to look up one institution at a time using this tool. The PSEO Data Explorer is most useful for comparing earnings outcomes for degree programs at the same institution rather than the same degree program across institutions.

Displaying the data, Step by step:

1. Open a web browser and visit the PSEO Data Explorer website.
2. On the left-hand side of the screen, **under Data Type, select “Earnings.”**

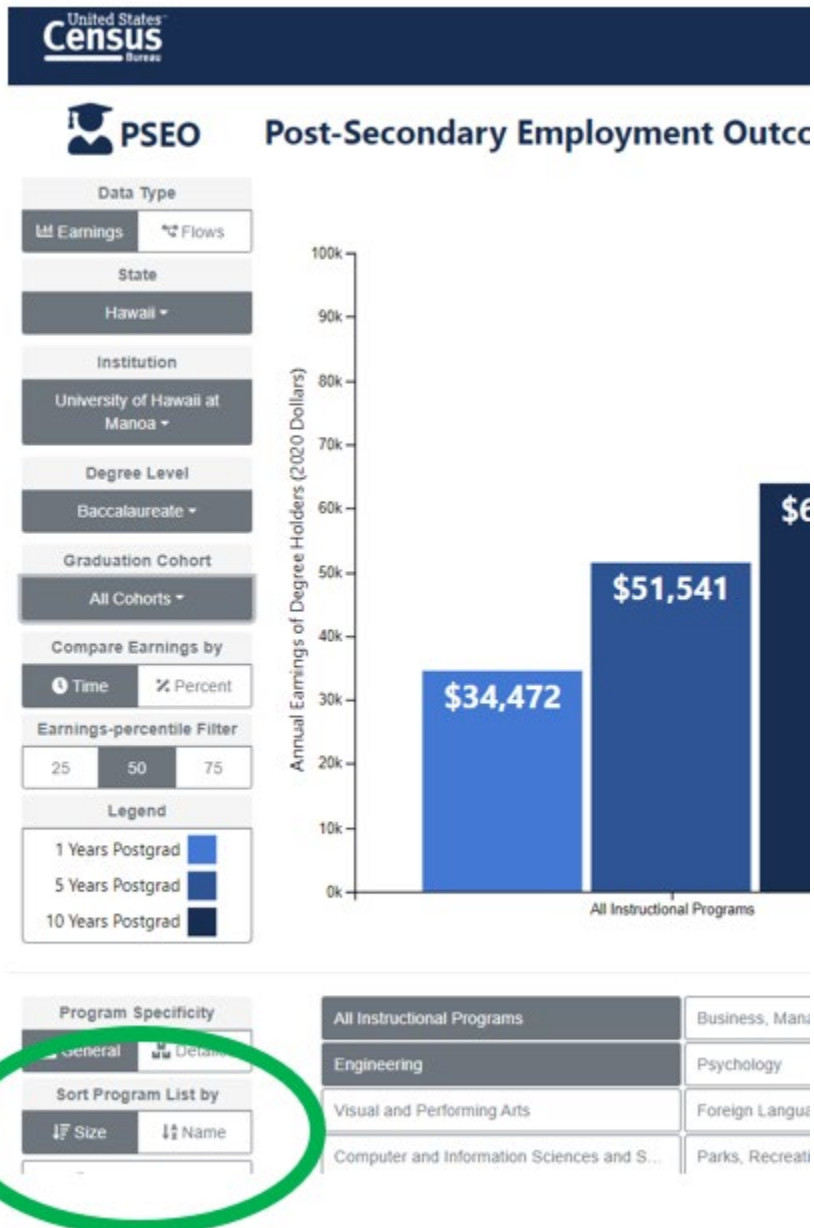


3. Then select the institution (college) you are looking for, the state in which the institution is located, and the degree level you are thinking about pursuing.
 - a. To move forward with this example, choose baccalaureate graduates from the University of Hawaii at Manoa from the appropriate drop-down menu.
 - i. The default setting for the PSEO Data Explorer will produce a graph showing average earnings (the median or 50th percentile) at 1, 5, and 10 years following graduation for all cohorts of graduates for whom data are available.
 - ii. Median vs the mean: The median is often used to report earnings figures instead of the mean because it provides a more accurate representation of the typical earnings within a group or population, especially when the data contain extreme values. Earnings data often follow a skewed distribution, where a small number of extremely high earners can significantly influence the mean. This can lead to a distorted average that does not reflect the typical earnings of the majority. The median, on the other hand, is not affected by extreme values and provides a better measure of typical earnings within a group.
 - b. You will only be able to look up one institution at a time using this tool. The PSEO Data Explorer is most useful for comparing earnings outcomes for degree programs at the same institution rather than the same degree program across institutions.

- c. Note that if you plan to get an associate degree and then transfer to a baccalaureate degree program, selecting “Associate” or “Baccalaureate” degree level will produce different numbers on the graph.
 - d. Median earnings differ by the degree level pursued in college due to several factors:
 - i. Specialized knowledge and skills: Higher degree levels typically provide more specialized knowledge and skills, which are in greater demand and command higher salaries in the job market. Advanced degrees such as baccalaureate and beyond often require a more extensive and rigorous curriculum, allowing graduates to develop expertise in specific fields.
 - ii. Job market demand: Certain professions or industries may require specific degrees or higher levels of education. For example, professions like medicine, law, engineering, or research often require advanced degrees. The demand for professionals in these fields tends to be higher, resulting in higher median earnings for individuals with higher degrees.
 - iii. Career advancement opportunities: Higher degrees often open up more significant career advancement opportunities. Many managerial and leadership positions require advanced degrees, and individuals with these qualifications may be more likely to secure higher-paying positions with greater responsibility and authority.
 - 1. You can see this pattern in the growth of earnings when you select 1, 5, or 10 years after graduating.
 - iv. Networking and connections: Pursuing higher degrees often provides opportunities for networking and building connections with professionals in the field. These connections can lead to better job prospects and higher-paying positions.
 - v. Long-term earning potential: While there may be an initial cost associated with pursuing higher degrees, it often translates into higher long-term earning potential. Graduates with higher degrees tend to have better prospects for promotions, salary increases, and career growth over time.
 - vi. Note that there are no guarantees. These factors are generalizations and may vary based on specific fields, geographic location, and individual circumstances. And remember that although higher degrees generally correlate with higher earnings, it does not guarantee success or job satisfaction.
4. At the bottom of the page, look for the listing of programs at the institution you selected. You can select more than one program at a time to compare earnings for multiple programs at the same institution.
- a. Select “All Instructional Programs;” “Engineering;” “Liberal Arts and Sciences, General Studies and Humanities” to move forward with our example.
 - b. It is a good idea to select “All instructional programs” –in addition to the specific program(s) you are interested in– so you can make comparisons to the overall average at your college of interest.



- c. Note that degree programs are sorted by size (# of graduates) by default, not in alphabetical order.
 - i. To list programs in alphabetical order, look for the “Sort Program List by” on the left-hand side of the screen and select “Name.”



- d. To move forward with this example, keep the default “Sort Program List by” setting on “Size.”
- e. If the program names are not specific enough, find the Program Specificity filter on the left-hand side of the screen. Click “Detailed” to move forward with our example.
 - i. Using Engineering from the previous chart as an example, click “Detailed” Program Specificity and now you will see the broad category of Engineering broken into five specific programs: Agricultural Engineering; Civil Engineering; Computer Engineering; Mechanical

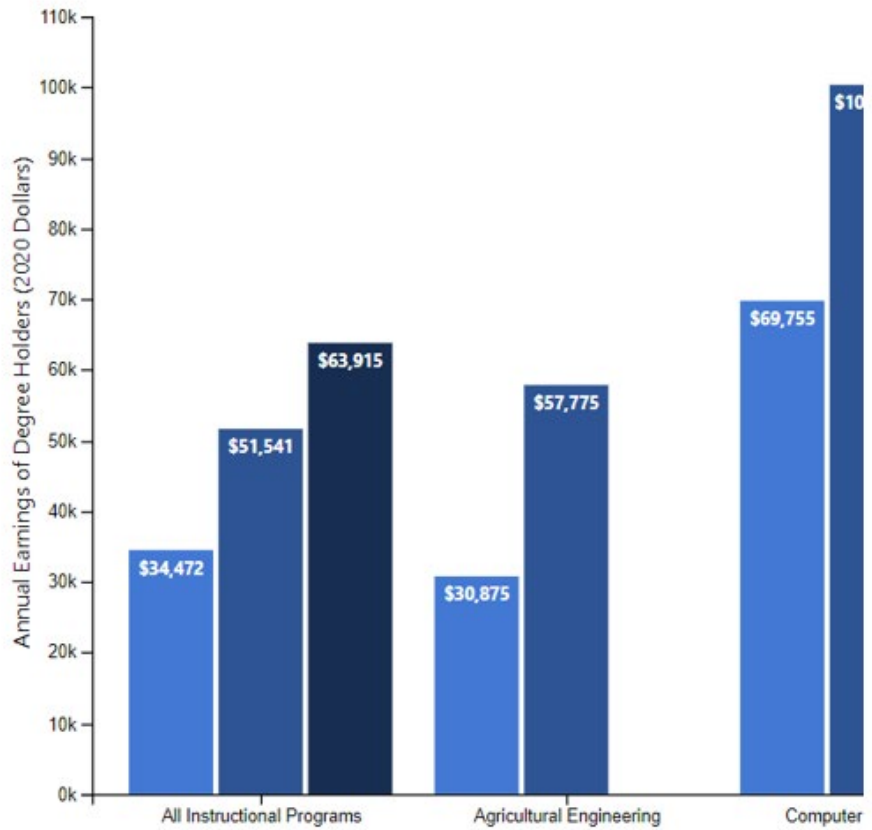
Engineering; and Electrical, Electronic, and Communications Engineering.

- ii. By mousing over the program name, you see the size of the graduation cohort used to calculate these earnings figures.
- iii. Note that the scale of the chart changes when you go from “General” to “Detailed.”
 1. This is because Computer Engineering graduate earnings are literally off the charts.
 2. When displaying results for Computer Engineering graduates alone, the chart will reflect the earnings distribution specifically for that group. It will show how the earnings are distributed among Computer Engineering graduates and provide a sense of the range and distribution of their earnings within the group, and Computer Engineering graduates earn more than other Engineering graduates at the low (25th percentile), middle (50th), and high (75th) points of the range. When separated from other Engineering majors, the scale must expand to display earnings for Computer Engineering graduates -- otherwise their earnings would be "off the charts."
 3. However, when Computer Engineering graduates are combined with all other engineering graduates, the chart will represent a larger group of Engineering graduates who do not earn as much as Computer Engineering graduates, and thus bring down the average and change the scale of the chart.



f. One additional method to find your program of interest: You can search for keywords in the box labeled “Filter Degrees” in the lower left-hand corner of the screen. Type the keyword in the box and the PSEO Data Explorer immediately displays any program names/descriptions containing your keyword.

Earnings Flows
 State: Hawaii
 Institution: University of Hawaii at Manoa
 Degree Level: Baccalaureate
 Graduation Cohort: All Cohorts
 Compare Earnings by: Time Percent
 Earnings-percentile Filter: 25 50 75
 Legend:
 1 Years Postgrad (light blue)
 5 Years Postgrad (medium blue)
 10 Years Postgrad (dark blue)



Program Specificity: General Detailed
 Sort Program List by: Size Name

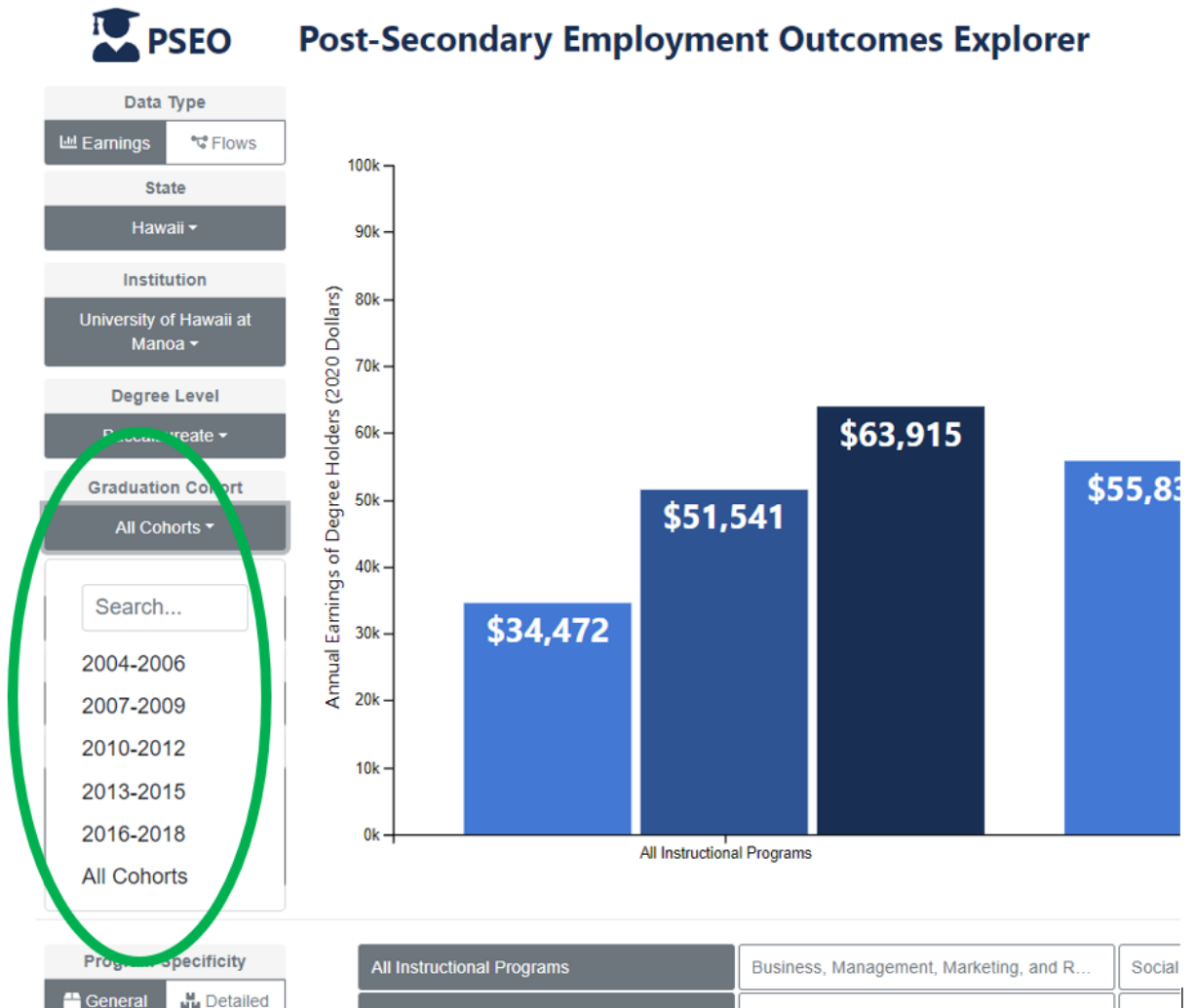
All Instructional Programs	Registered Nursing, Nursing Administrat
Communication and Media Studies	Marketing
Civil Engineering	Biology, General
English Language and Literature, General	Family and Consumer Economics and R
Ethnic, Cultural Minority, Gender, and Gro...	Mechanical Engineering
International Business	History
Apparel and Textiles	Dental Support Services and Allied Prof

- g. If you still do not see the program you are looking for, it is most likely a result of the PSEO Data Explorer reporting figures by CIP code and description rather than the exact program name used by individual colleges.
 - i. CIP stands for Classification of Instructional Programs. CIP codes are standardized numerical codes and descriptions assigned to academic programs to categorize and classify them according to their content and

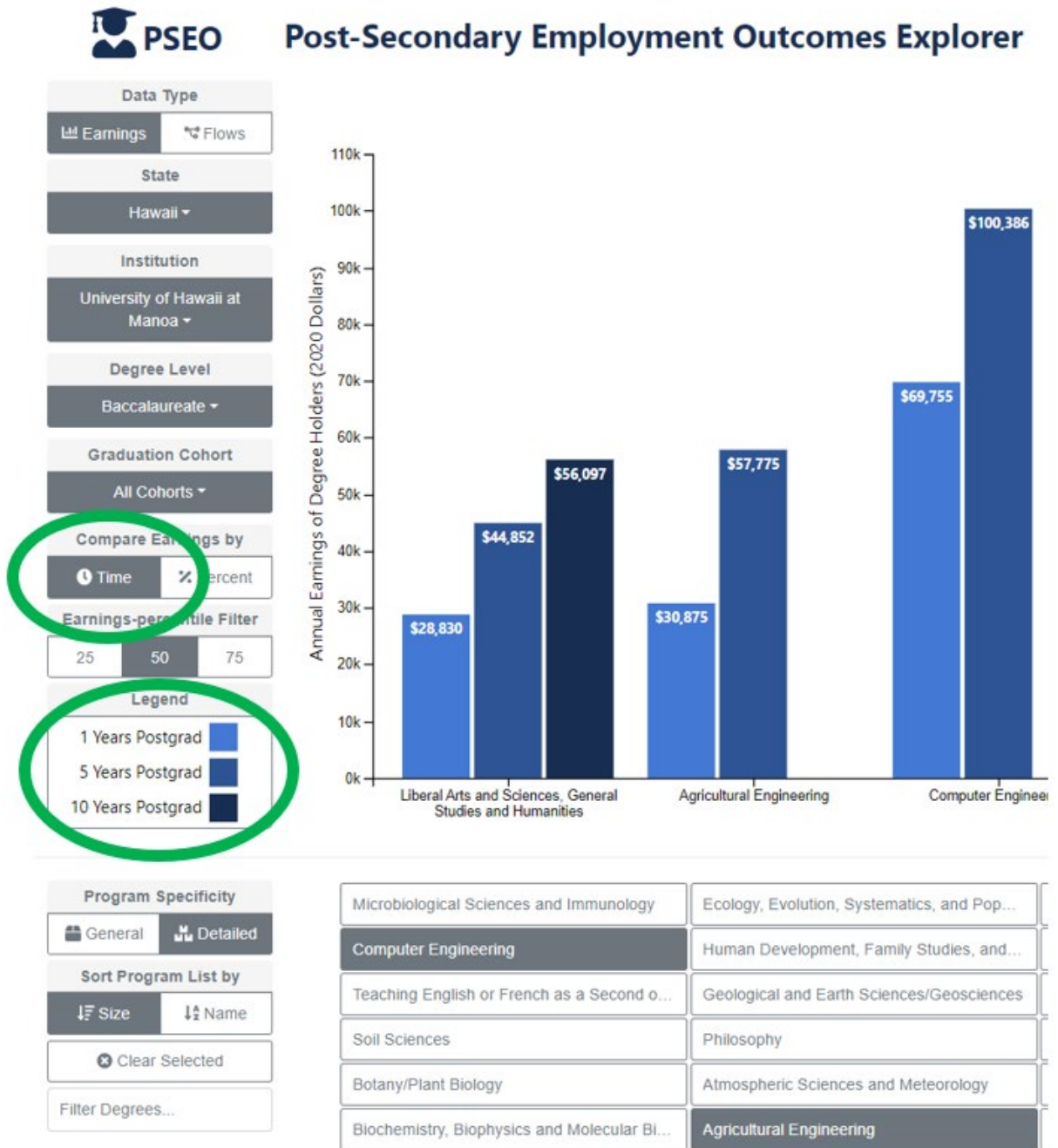
- subject matter. These standardized codes and descriptions allow for comparisons across institutions.
- ii. A program name is the specific title or label assigned by the college or university to describe a particular academic program. While CIP codes offer a standardized classification system -- allowing for comparisons across colleges -- program names can vary and reflect the unique branding and terminology used by each institution.
 - iii. The PSEO Data Explorer reports data by CIP code and description, not by each individual college's program name.
- h. Note that there may be too few graduates in the major and college that you select to produce results.
- i. For example, notice that the dark blue (10-year) bar is missing for both Agricultural Engineering and for Computer Engineering. There are either too few graduates in the major, or the programs have not existed long enough to produce graduates.
 - ii. Why does the program size matter? Reporting statistics for a small group (for example, small programs at small colleges) is generally not a good idea for several reasons, including privacy and confidentiality, statistical reliability, inadequate sample representation, increased sensitivity to outliers, and limited comparability.
 1. *Privacy and confidentiality concerns*: Reporting statistics for small groups (also referred to as small cell sizes) can potentially breach privacy and confidentiality standards. When dealing with sensitive or confidential information, reporting statistics for small groups increases the risk of inadvertently revealing individuals' identities. Take the extreme example of program Y at college X with only 1 graduate. Average earnings for that program means reporting that one graduate's earnings.
 2. *Statistical reliability*: When a group is too small, the resulting statistics may not be reliable and can lead to unstable estimates, making it difficult to draw meaningful conclusions or make accurate predictions.
 3. *Inadequate representation of the entire group*: Small groups may not adequately represent the underlying population or subgroup being analyzed. The limited number of observations can introduce bias and distort the true characteristics of the population, leading to misleading or incorrect interpretations. It becomes challenging to generalize findings from small groups to the broader population accurately.
 4. *Increased sensitivity to extreme values ("Outliers")*: With small groups, the presence of even a single outlier (for example, an individual with extremely high or extremely low earnings) can disproportionately influence the reported statistics. Outliers have a greater impact on smaller groups, potentially skewing the results and leading to erroneous interpretations. It becomes

difficult to discern whether an observed effect is genuinely meaningful or simply a result of a few extreme observations.

5. Choose the graduation cohort for which you want earnings data. The graduation cohort is the year in which a student graduated. The default is “All Cohorts,” and that is sufficient for many purposes. If you are interested in earnings for only the most recent graduates, select more recent years like 2016-2018 from the pull-down menu.
 - a. You cannot retrieve results for a single graduation cohort, only groupings of three or more.
 - b. Keep in mind that limiting your selection to more recent years reduces the size of the population for which the tool reports data, and results might be subject to small group size limitations (see above).
 - c. Data in the PSEO Data Explorer have been adjusted for inflation so that earnings over time are comparable (this adjustment addresses the fact that a dollar today is worth less than a dollar tomorrow.)
 - i. Adjusting dollars for inflation when reporting numbers across time is crucial for accurate and meaningful analysis. Inflation refers to the gradual increase in the general price level of goods and services over time, leading to a decrease in the purchasing power of a currency. By adjusting dollars for inflation, we account for the changing value of money and enable valid comparisons of economic data and financial figures across different time periods.
 - d. To move forward with this example, select the default setting “All cohorts.”



6. So far in this example, we have focused on median earnings at 1, 5, and 10 years following graduation – the default setting for the PSEO Data Explorer.
 - a. Default: On the left-hand side of the screen, “Compare Earnings by” is set to “Time.” The legend shows the color assigned to each time period: The darker the color, the longer the time period following graduation.
 - b. The Earnings-Percentile Filter is set to the median or 50th percentile.



7. You can also choose to see the 25th, 50th (median), and 75th percentile by selecting “% Percent” under “Compare Earnings by” on the left-hand side of the screen.
 - a. These percentiles give you a sense of the range of earnings outcomes for graduates.
 - b. *25th, 50th, 75th percentiles*: Percentiles are statistical measures that divide a dataset into groups: The 25th, 50th (also known as the median), and 75th

percentiles provide insights into the distribution of a dataset by dividing it into quarters. They help identify how your data are spread across the range.

- i. *25th Percentile (Q1/Quarter 1)*: The 25th percentile represents the value below which 25% of the data fall. In other words, it divides the dataset into quarters. This value is also known as the lower quartile (Q1). It indicates that 25% of the data points are lower than or equal to this value, while 75% of the data points are higher than or equal to it.
 - ii. *50th Percentile (Q2/Quarter 2 or Median)*: The 50th percentile, often referred to as the median, divides the dataset into two equal halves. It represents the middle value of the dataset when arranged in ascending or descending order. This means that 50% of the data points are lower than or equal to the median, and 50% of the data points are higher than or equal to it.
 - iii. *75th Percentile (Q3/Quarter 3)*: The 75th percentile represents the value below which 75% of the data fall. It is also referred to as the upper quartile (Q3). This value indicates that 75% of the data points are lower than or equal to this value, while 25% of the data points are higher than or equal to it.
- c. To move forward with this example, select “% Percent” under “Compare Earnings by” on the left-hand side of the screen.
- i. Note that switching from “Time” to “% Percent” causes the color scheme of the chart to change from blue to orange.



Post-Secondary Employment Outcomes Explorer

Data Type
 Earnings Flows

State
 Hawaii

Institution
 University of Hawaii at Manoa

Degree Level
 Baccalaureate

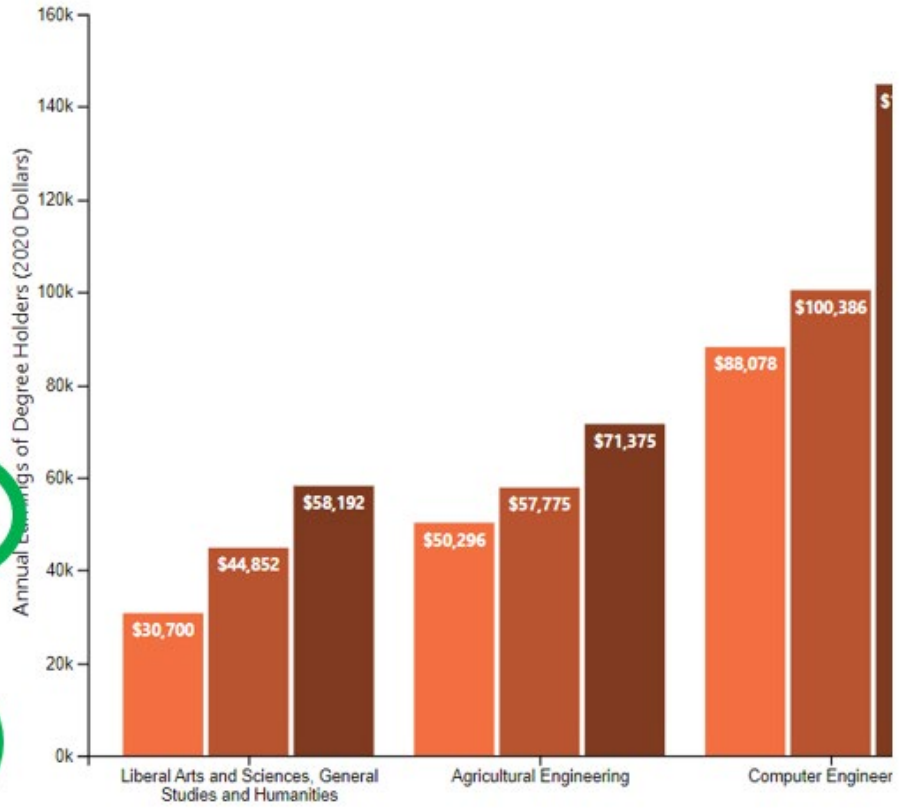
Graduation Cohort
 All Cohorts

Compare Earnings by
 Time Percent

Years-post-grad Filter
 1 5 10

Legend

- 25th Percentile
- 50th Percentile
- 75th Percentile

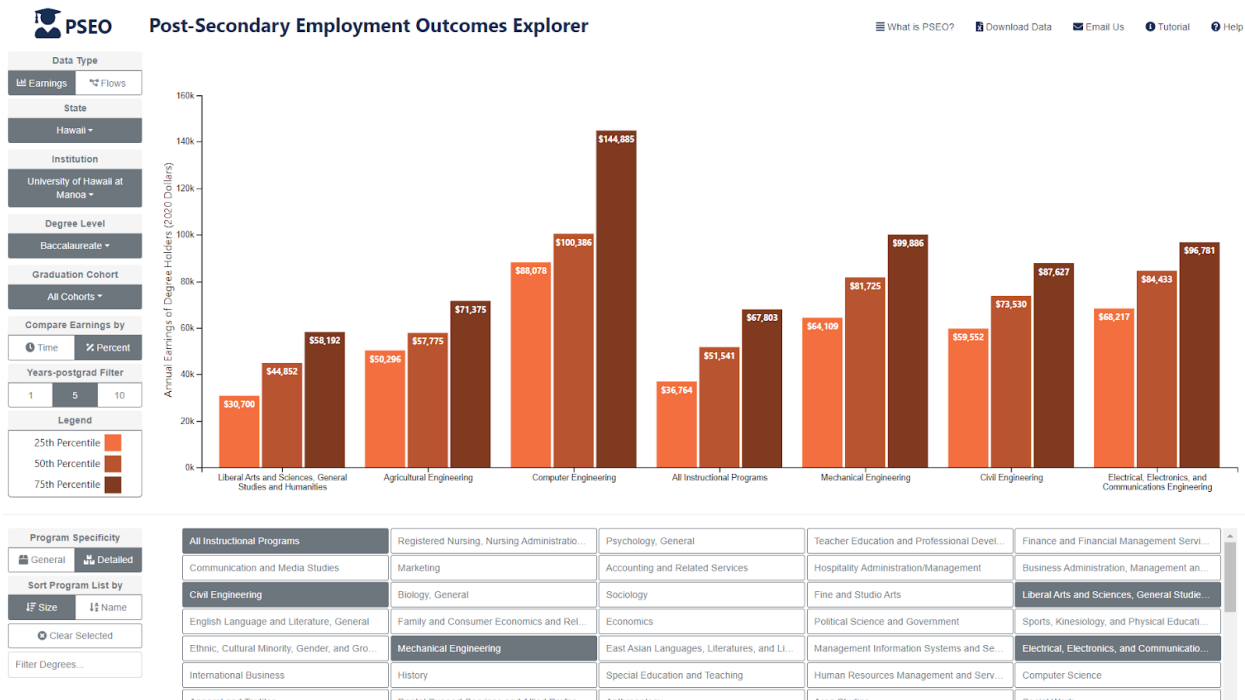


Program Specificity
 General Detailed

Sort Program List by
 Size Name

Microbiological Sciences and Immunology	Ecology, Evolution, Systematics, and Pop...
Computer Engineering	Human Development, Family Studies, and...
Teaching English or French as a Second o...	Geological and Earth Sciences/Geosciences
Soil Sciences	Philosophy
Botany/Plant Biology	Atmospheric Sciences and Meteorology
Biochemistry, Biophysics and Molecular Bi...	Agricultural Engineering

8. You should now see the following results on your screen:



- When you choose to display earnings and compare them by percent, your screen will display the range of earnings of your graduates -- 25th percentile (the lower end), 50th (the average or median), and 75th (the higher end).
- Displaying the highest and lowest values –instead of percentiles– may give you a warped view of the range of earnings of your graduates based on just one or two people. The 25th and 75th percentiles, on the other hand, provide a more reliable view of the range -- 25% of graduates earn even less and 25% earn even more than the percentiles displayed.

What you can say: If you followed the steps in this example, the resulting chart shows the range of annual earnings for graduates from the Engineering programs and Liberal Arts programs at University of Hawaii at Manoa compared to graduates from all degree programs five years after graduation. Given the major you/your child is considering, can they earn enough to support themselves given the numbers in the chart, where they want to live, and what their career and life goals are? There is no single, perfect answer for every person. The PSEO Data Explorer offers valuable insights into past trends and patterns, enabling informed decision-making. While it may not predict future outcomes, it serves as a reliable reference point for understanding historical data. In examining numbers from the data tool, consider other factors that may have influenced the data, such as policy changes, economic conditions, technological advancements, and variation in individual student characteristics like grit, motivation, and skills attained while in school. By examining the broader context, you can better interpret and apply the results obtained from the PSEO Data Explorer. Remember that these findings should be used as a starting point for further analysis and exploration, rather than definitive conclusions. For a listing of factors that provide important context for the results you will see from the tool, see the Glossary of Terms and Concepts.