

# IS COLLEGE WORTH IT?

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## 1 Overview

We chose the question “Is college worth it?” as numerous individuals today are concerned about the value of a college degree. Tuition increases each year, student loan debt has reached unprecedented heights, and numerous graduates are uncertain if their earnings will adequately reflect the expense of their education. These practical issues contribute to the continuous national discussion about the worth of higher education.

Being students facing these challenges firsthand, our team aimed to comprehend the issue through real data instead of opinions. We aimed to explore if attending college still offers a substantial return on investment (ROI) and how this benefit fluctuates due to elements such as major, type of institution, or geographical location.

We developed a scrollytelling system with D3.js to investigate this question. This engaging format enables users to navigate the narrative incrementally while observing visualizations that emphasize tuition trends, student debt challenges, earnings results, and long-term financial benefits. Our platform integrates data, storytelling, and interactive graphs to assist users in developing their own evidence-driven viewpoint on the value of a college education relative to its expenses

## 2 Datasets

The United States Department of Education has a College Scorecard[2] that is an unimaginably large dataset first released during

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the Obama administration[3]. The dataset is 450 MB big and contains any data imaginable about an academic institution from 1996 to 2023. The use case for this dataset was to provide both positive and negative views on attending universities. For example, for the college is not worth it side, the data was cleaned to only have the cost of tuition annually vs the yearly income of a student after 10 years. This would usually be a good addition for the opposing side however, you can “mislabel” the yearly income to be total income since graduating 10 years ago and you have a data visualization that shows that 90% of universities do not have a good return on investment.

The Student Loan Dept By School[1] dataset includes the number of borrows, the number of borrowers, the amount of loans originated/disbursed, for the different types of loans made to the students of the different institutions in the USA. The dataset was collected to analyze the number of borrows in relation to the number of students for the different types of loans for the different institutions. The dataset contains information for the different regions of the USA.

Unemployment Rates and Earnings by Educational Attainment” (Table 5.1) from the U.S. Bureau of Labor Statistics (BLS). [5]

The BLS dataset on Unemployment Rates and Earnings by Educational Attainment presents median weekly earnings and unemployment statistics for individuals aged 25 and above, categorized by various education levels. It demonstrates that as education levels increase, income rises and unemployment falls. This dataset assists in examining the economic results linked to attaining advanced levels of education

BLS Table 5.3 – Education and Training Requirements by Occupation [4]

This dataset illustrates the common education requirements for various professions, including necessary training and experience. It demonstrates how the level of education influences access to different career options and job categories. Our visualization facilitates a comparison between levels of education and the types of jobs that are accessible

The analysis in this project also uses microdata from the U.S. Census Bureau's Current Population Survey Annual Social and Economic Supplement (CPS ASEC)[6]. This dataset provides detailed individual-level information including age, highest level of education completed, certification status, and a dedicated field reporting annual retirement income. These variables allowed us to group respondents into age bins, compare income outcomes across education levels, and examine how certifications influence financial well-being. Together, these fields enabled a comprehensive evaluation of the long-term economic value of college degrees relative to alternative pathways.

### 3 Narrative

Our platform presents two differing narratives regarding the worth of a college degree through an engaging ASU campus map. Rather than scrolling through simple text, users "walk" around the campus: they guide a character along a route, pause at recognized buildings, and view visualizations appear at every spot. Every structure functions as a chapter in a narrative, featuring unique storytelling and imagery that either reinforces the belief that college is beneficial (Story 1: Yes) or questions its worth (Story 2: No).

In Story 1 (Yes side), the user navigates a path that emphasizes the advantages of obtaining a college degree. At places like Student Financial Services, the system illustrates the connection between advanced education and increased weekly wages along with reduced unemployment rates. The explanation states clearly that having a degree is among the most reliable indicators of steady income and job security. In Career Services, a different visualization illustrates how various education levels transition into actual jobs. We also present statistics about both the median and range of salaries that degree holders can expect at different point in their careers, as long as long-term health outcomes for degree holders. The narrative highlights how higher education can create opportunities for a greater variety of job prospects and sustainable career advancement, arguing that for numerous individuals, financial investment in schooling yields benefits.

In Story 2 (No side), the user takes an alternate path that emphasizes the financial dangers and drawbacks of attending college. The adventure starts at locations such as the Bus Stop and Chase Bank, connecting to the concept of students relying on loans and financial entities. At the map visualization point, users observe the differences in college availability and cost throughout the nation, highlighting geographic disparities in access and tuition. In the Financial Aid Office, a bubble chart illustrates the extent to which students from various schools depend on federal loans, prompting concerns regarding the level of debt students incur merely to obtain a degree. At WP Carey, a hexbin chart contrasts average yearly expenses with income a decade post-graduation, indicating the areas of the chart that yield positive ROI and those that do not. Subsequent visits to Career Services and the Church examine how certifications and non-degree options can occasionally result in comparable earnings, and how the disparity in retirement income between degree and non-degree holders is not as large as many

assume.

The narrative concludes at Old Main, a significant graduation landmark on campus. An animated graphic displays the journeys of individual students: green lines indicate those who graduate within six years, while red lines signify students who leave without finishing. This last perspective highlights that not all students who begin college complete their journey, and that the expenses and dangers are not distributed equally.

We selected this two-story scrolltelling layout featuring a map because it enhances the topic's relatability and appeal. Rather than only learning about "ROI" in theoretical terms, users engage in the discussion by traversing actual campus sites, observing data at each point, and juxtaposing the "Yes, it's worth it" against the "No, it's not always worth it" viewpoints side by side.

### 4 Innovative Visualizations

Two of the visualizations in the scrolling telling website stuck out more than others. These innovative visualizations provided a new visual representation that is not seen often. The visuals are not using off the shelf tools and thus require greater thought and creativity to deliver.

The first innovative visualization is a modded visualization that makes getting to your destination a form of representing percentiles. The user is greeted with a map that has an icon. This icon is the final destination, more specifically it is the completion of the goal of the university. For example, it implies completing the degree, staying after the first year, not transferring, etc. As the user scrolls through the webpage they begin to see routes coming from all sides collectively all heading towards the same destination. The movement by the routes is like how a GPS routes to a destination. The user will see red routes that halt part-way through while others make it to their destination and are green. The green route lines are the students who are on the side of what a university wants. The red however is the opposite, these are students who drop out and move on to other challenges. For this instance the routes are for the average completion rate for a student after 6 years. Each line is a student and since the average completion rate was 50% there were five lines who were green and five who were red.

This innovative visualization at its core is a pie chart. It takes percentages of two sides that add up to 100. However, the way this data is represented can only be used for this theme and use case. This is a modded innovative visualization since it takes the general idea of a pie chart and turns it into a creative design that keeps with a general theme and adds an unique functionality.

Our second innovative visualization is a modification of the sunburst visualization. The sunburst visualization presents a hierarchical view of the dataset, beginning with age bins at its center and expanding outward to show progressively more detailed groupings. A key innovation in this design is the interactive tassel mechanism, which allows users to reveal deeper levels of information gradually rather than being confronted with the entire hierarchy at once. By

pulling the tassel to different positions, users first uncover whether individuals in each age group completed a college degree and then reveal whether those individuals obtained professional certifications. This staged approach creates a guided exploration experience that reduces cognitive load and encourages users to make sense of the data step by step.

The visualization draws on demographic and workforce variables from the CPS ASEC dataset, organizing them into a three-level structure that represents age, education attainment, and certification status. Sunburst charts work well for this kind of nested categorical data because they make proportional relationships visible within each layer of the hierarchy. The tassel interaction ensures that users examine one dimension at a time, which helps maintain clarity when interpreting complex information. As the sunburst expands outward, users can easily compare how education levels and certification patterns shift across different age groups, creating a coherent visual narrative of skill development in the workforce.

The sunburst reveals several important patterns. A significant portion of individuals who completed a college degree also pursue certifications, often exceeding half of the population within many age groups. This suggests that the degree alone may not provide the skills needed for long-term career advancement. In contrast, individuals without a college degree rarely pursue certifications, which limits their opportunities to improve their earning potential. One of the most notable findings is that income differences between degree holders without certifications and non-degree holders with certifications are very small. This raises essential questions about the economic value of a traditional degree compared to certification-based pathways, especially when considering the financial cost of higher education.

## 5 Discussion

Our results indicate that while college typically offers significant benefits—like increased income and reduced unemployment—it is not inherently “worth it” for everyone. The increasing tuition fees and the mounting pressure of student loans diminish the financial advantages for numerous students, particularly those who choose majors with lesser earning potential. We noted that return on investment (ROI) can fluctuate significantly based on the major, the kind of institution, and the state in which a student enrolls. This implies that students need to thoughtfully evaluate both the expenses and the anticipated income before concluding if college is the appropriate choice.

During the progression of our project, we encountered challenges associated with integrating various datasets that vary in format, scale, and detail. We found it equally difficult to develop interactive D3 visualizations that effectively showcase intricate relationships in a clear and engaging manner. Creating the scroll-telling experience demonstrated the significance of planning the narrative progression, determining what information is presented at each phase, and making sure the interactions are seamless and

user-friendly.

In the future, we could enhance our system by incorporating more detailed analyses—like salary comparisons based on specific majors or types of institutions. Additionally, we might include elements such as anticipated lifetime income, calculators that assess individual ROI based on user data, or sophisticated interactive tools that enable users to emphasize and refine data across various charts. These enhancements would render the system increasingly informative and tailored for students making choices regarding higher education.

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