CSC Education Visual Data Design Doc

By Jack Pharies

Description:

Standards of education have been a constant idea that changes over time. Just now, Centre College has changed it's standards for the Politics major and last year changed the Computer Science major. However, while the college level is at a constant state change preparing students for the job market, k-12 education is slow to change. Thus the cause we undertook is the benefits of computer science and related course being a part of the general education requirements in a k-12 environment. It is hard to disagree with this cause, Computer Science degrees are one of the most desired degrees in the job market, and knowing any sort of computer skills gives a person a serious advantage anywhere else in the market. However, the argument might be that computer science is much too difficult to teach, and also that it serves no purpose until the college level. We disagree. At the basic level computer science is logic, and teaching logic games can help in more than one field. Take law, where in the LSAT there is a logic question section that people study for months. We computer scientists were able to acquire a copy and answered the questions with minor difficulties, due to our nature of being able to solve algorithms in a very logical matter. Next, many coding websites have been developed and are tailored towards the k-12 level. A change to the education system would not only benefit the youth, but benefit the economy. We must add computer science to the k-12 level.

Data Collected:
The data collected are statistics based on the 50 states. Each dimension applies to the state, as the idea is to create a map of the United States for the visualization.

The data was from two different locations:

The first is from code.org. Code.org and the academy is an online nonprofit that focuses on bringing computer science to the k-12 environment. They keep their own database on statistics on all sorts of material, but we ended up focusing on a state to state document. At the same time, Code.org has yearly reports that summarizes their efforts in the year. They are a leader in k-12 computer science education and a trusted source to use for data. The dimension hear are based around whether states have certain aspects that relate to k-12 computer science (Funding, a State Plan, Standares, Required High School class, etc), which can be correlated to other state data.

The second source is the Bureau of Labor Statistics (BLS). The BLS is part of the U.S. Department of Labor and keeps tracks of economic information based on the United States economy. They keep track of information for the government, and also report in yearly reports so that we can match years with code.org data. For the BLS, we took a look at total employed in the computer science field and total employed overall so that an average of total employed in the computer science field as a percentage of total employed per state could be made.

Findings:

The data we use is displayed in the charts below. In all charts, the x-axis is the 50 states in alphabetical order. The y-axis is the percent of the total employed for computer science related jobs in a state as a percentage of the entire employed population of the state. This data is taken from the BLS as described above.

Each graph is color coded depending on the situation. The color coding goes as followed:

> **Red**: does not have the item described.
> **Green**: does not have the item described.
> **Yellow/Black**: the state has another option or is currently working towards the item described.

Figure 1 shows if the state has active funding towards Computer science programs:

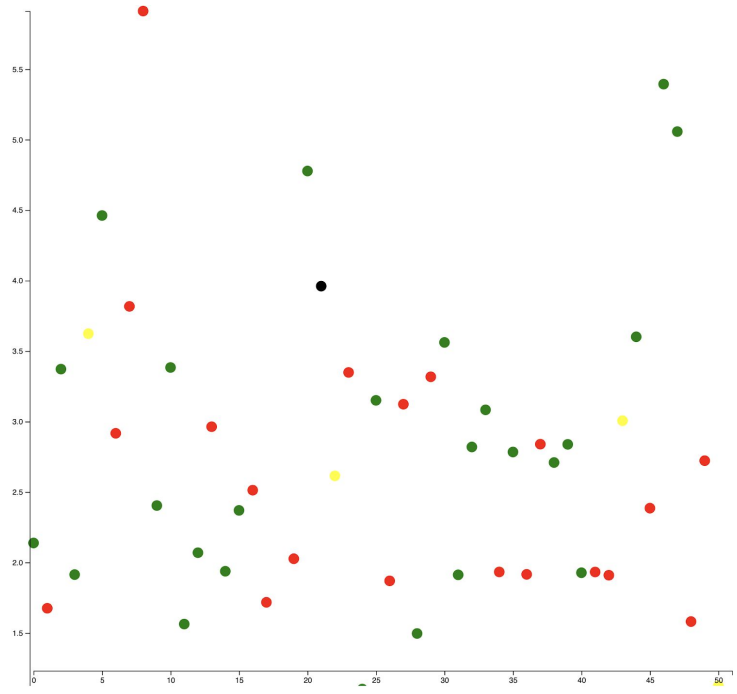

Figure 1

Figure 2 shows whether the state has a state plan towards k-12 computer science programs:

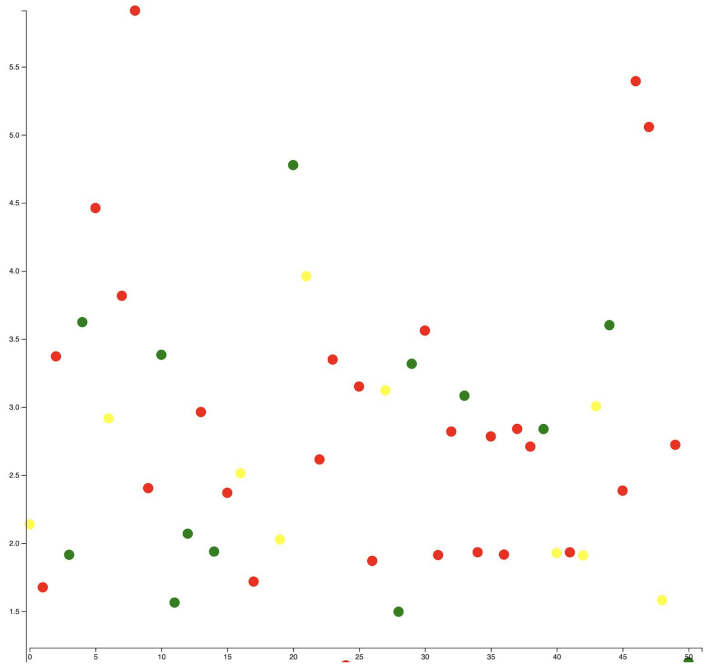

Figure 2

Figure 3 shows whether a state has an active position for computer science:

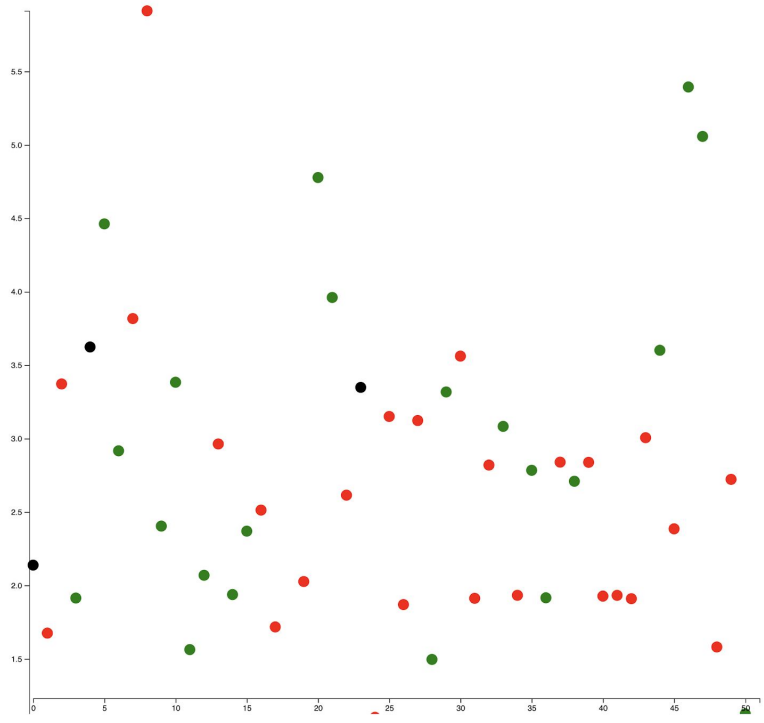

Figure 3

Figure 4 shows whether a state requires highschool to teach computer science classes:

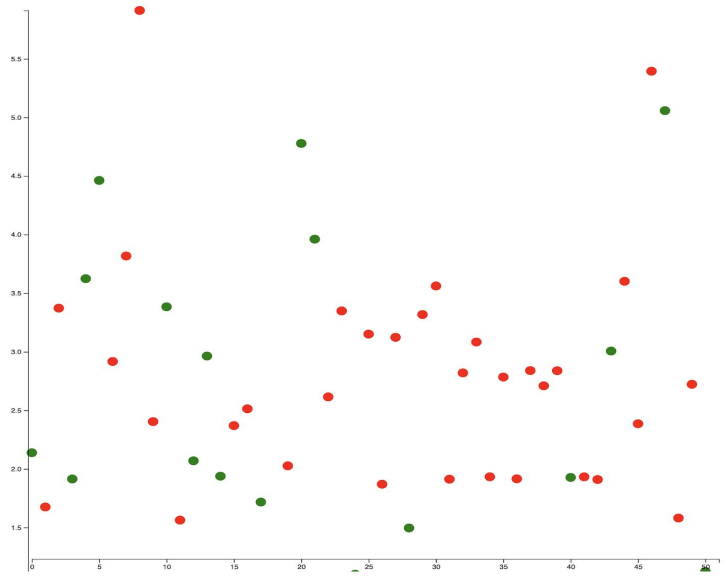

Figure 4

Figure 5 shows whether the state defines clear computer science standards:

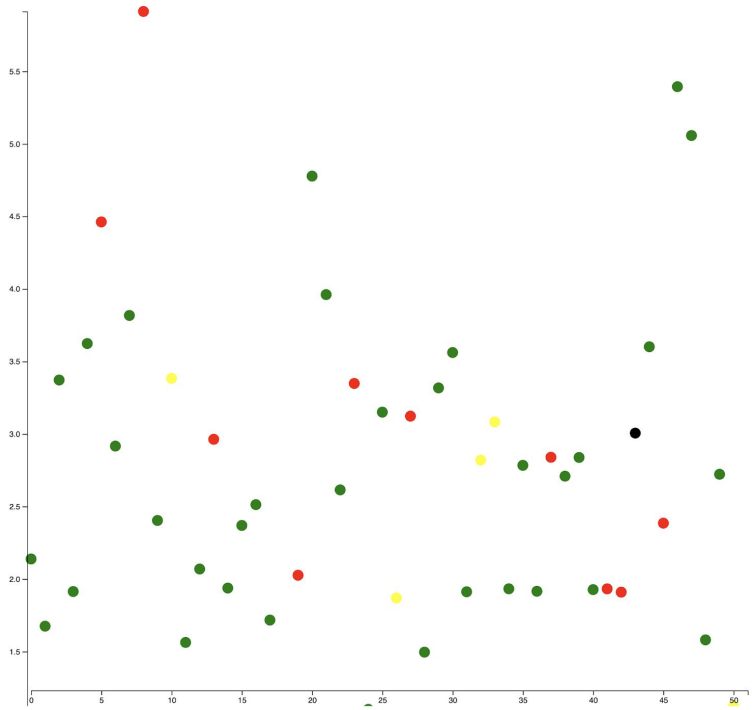

Figure 5

For this data there is a trend that if a state requires computer science in highschool, they take an active position, or the state provides funding towards computer science. The highest ones are where the most green is. This means that there is some correlation between these aspects that affect CSC in k-12 environments and the number of computer science jobs per state. However, the data looks at an average, putting all states on the same level. This does not help states such as California, who produces the most computer science jobs but also has such a big job market it is pushed down to compare with smaller states.

The entire point of comparison was to find out how computer science can be increased in the k-12 environment, and by using graphs like this we could discover the ways in which we can increase computer science in schools. At the same time we could look deeper into each one of these stats to see how much they plan or what they will be doing in order to help their cause.

Conclusion:

The data that we will use will be helpful to identify how states can change in order to provide a better k-12 education, at the same time it will provide where states need to change instead of the very general notion of change. The visual that can be created with this data can be very useful and helpful in explaining where states fall short and where they can improve, and give people a lot more of an idea of how the state can change.