Relationship between Economy and Education in U.S.

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1 Introduction

In recent decades, education has always been a major focus of social concern. Every human being needs oxygen to survive in the world. Education is as important as this because education gives people the knowledge and skills they require. Education is important to people of all ages and it has no limit. Education provides us with knowledge about the world. It paves the way for a good career. It helps build character. It leads to enlightenment. It lays the foundation of a stronger nation. Education makes a man complete. Thus, we try to find something may influence or be influenced by education.

The United states is a vast country with 50 different states. The level of development and economy varies from state to state. In recent years, the whole world paid more and more attention to education, and many scholars study the relations between resource inputs and school outcomes.[1] There are also many scholars who analyze the financial aspects at a higher level, the relations between state income and education investment. This paper analyses the interstate differences of education level in the United States, and describes the interstate economic development level differences with three statistical revenue data reflecting the local income level, in order to find that the interstate differences of education level and economic development level have some consistency. And interactive map [2, 3] is the best method to show relationship between directly.

Secondly, we all know that the quadrennial presidential election will be held in next year. We divided the dataset into several different periods according to the temporal president including Obama and Bush, etc. We think different national policy in different periods may affect both of economy and education. Thus, there is intricate slope chart [4] in this project which represents the trend in every state in last 25 years.

2 Description of this project

Based on the raw data we found, we try to find the relations between school outcomes and state economic development level [1], and the changes among all the states within 25 years.

3 Project type

Our project type is a research.

4 Audience for this project

According to the analysis of the income level of each state on the education level, found that the education level has a strong influence on the local income level, so the outcome of this project may prove, to a certain extent, that changing the local education level and the local education structure is helpful to promote regional economic development and is an effective measure to adjust the gap of economic development among states.

With adopting the proposed outcome, analyzing the differences in educational development among the states can not only

fully understand the economic development gap, but also help to readjust and integrate the cooperation and competition relations between the states, help the president adjust tax revenue and narrow the economic development gap.

5 Approach

First, we found the large amount of real date in all the states within 25 years, during four presidents' term and then initial dynamic graph, Interactive visualization and multiple views. Various of paper do the analysis but not raise visualization views to show the relationship better.

6 Impact statement (conclusion statement) for this project?

The good scenario is that the results show a strong relation between economic development and education level in the majority of the states. The best-case scenario is the relation changes a lot or have a gap during the different presidents' term.

7 All major milestones for this project.

1. Download the raw data and use python to preprocessing data.
2. Experiment with map and pie charts.
3. Add year pivot to find the changes with years.
4. Analyze the results using Python.
5. Analyze the results and find if it consistent with presidents' education discipline guidelines.

8 Obstacles during this project

8.1 Major obstacles

• There is a pivot under map which can control the year and data will be changed. This is a technical challenge to our team.

8.2 Minor obstacles

• Our team is not familiar with United States national conditions, so it's a little difficult for us to analyze these aspects.
• Collect news and policies under different presidents.
• Visualize all the data effectively and easy to understand. [5]

9 Resources needed

1. A thorough education literature review of four presidents.
2. Some help with using Python for analyzing this type of results.
3. Code of a U.S map to make an interactive visualization map.

10 Definition of Success

If the result we find can show definite relations between educational standard and state economic development level, we will have enough evidence to compare the result we got with the official data provided by the government and have some interesting conclusion.

11 Major publications relevant to this project

• The works by Gennady L. Andrienko et al.[2] and Ann Sloan Devlin et al.[3] are crucial related with this project, as it helps us make an interactive map.
• George Robertson, Roland Fernandez, Danyel Fisher, Bongshin Lee, and John Stasko's research[4] made us decide to use a animated line chart to show the trend.
• Christopher G. Healey' s paper[5] made whole project more beautiful and easier to understand with effective colors.
• We learn the relationship between economy and education from the papers by Larry V. Hedges, Richard D. Laine and Rob Greenwald[1].

Reference

[1] Larry V. Hedges, Richard D. Laine and Rob Greenwald, Does Money Matter? A Meta-Analysis of Studies of the Effects of Differential School Inputs on Student Outcomes, *Educational researcher*, April 1994.
[2] Gennady L. Andrienko and Natalia V. Andrienko, Interactive maps for visual data exploration, *International Journal of Geographical Information Science*, August 2010
[3] Ann Sloan Devlin and Jason Bernstein, Interactive Way-finding: Map Style and Effectiveness, *Journal of Environmental Psychology*, June 1997
[4] George Robertson, Roland Fernandez, Danyel Fisher, Bongshin Lee, and John Stasko, Effectiveness of Animation in Trend Visualization, *IEEE Transactions on Visualization and Computer Graphics*, Nov.-Dec. 2008
[5] Christopher G. Healey, Choosing Effective Colours for Data Visualization, March 2009