The Relationship Between Iowa Public School Budgets and Student Proficiency

Nicolas J. Vetter

Northwest Missouri State University, Maryville MO 64468, USA
S567397@nwmissouri.edu or nvetter73@gmail.com

Abstract. The writer will complete the Abstract last.

Keywords: Data Analytics · Iowa Public School · Budgets · Proficiency

Helpful Links:

- GitHub Capstone Repository:
  https://github.com/VetterNic2/msda-capstone

- Public Overleaf:
  https://www.overleaf.com/read/bhvmwnchhksz#8526a8

1 Introduction

Whether you grew up in the house of a teacher/parent or not, you probably have a memory or two about your high school life. Whether your school was rich or poor, all Iowa Public Schools have a duty to give their students the best chance to succeed after they graduate. In order to give their students the opportunity to be successful, the school system needs to invest their resources into their pupils. This project is going to show which Iowa Public Schools invested the most/least in their students. This report will also give the reader an idea of how much of an investment a school should spend to make their student the most successful they can possibly be, and whether there is a correlation between proficiency and investment per pupil. Success will be measured by proficiency scores in this report. These scores will be cleaned in PostgreSQL, analyzed through machine learning in Python and visualized in Tableau. The data sources and references are shown in their respective sections.

Limitation: Iowa Public schools have several different budgets for all kinds of expenditures. Because of the short report time-frame, the writer will not be able to analyze every budget within the Iowa Public School system. The writer is going to keep it simple and analyze the budget every Iowa Public school used in the 2017 academic year: general instruction.

1.1 Goals of this Project

2 Data Sources

- Math and Reading Proficiency in Iowa by School Year:
  https://data.iowa.gov/Primary-Secondary-Ed/Math-And-Reading-Proficiency-in-Iowa-by-School-Yea/f3h8-mnxi/about_data

- Iowa School District Expenditures by Fiscal Year:
  https://data.iowa.gov/School-Finance/Iowa-School-District-Expenditures-by-Fiscal-Year/uutu-bzs3/about_data

2.1 Data Collection

– **Math and Reading Proficiency in Iowa by School Year:**

This data set was collected from the Iowa.gov website as public information. The Iowa.gov website has an "Action Query" function that helps the writer filter the necessary data from the dataset. This is called preliminary cleaning of the dataset and the dataset will be cleaned again in section 3 of this report. The writer will only be using the proficiency rating of the 2017 11th-grade students in each respective district. This is to shorten the report for the tight time window.

– **Iowa School District Expenditures by Fiscal Year:**

This data set was collected from the Iowa.gov website as public information. The Iowa.gov website has an "Action Query" function that helps the writer filter the necessary data from the dataset. This is called preliminary cleaning of the dataset and the dataset will be cleaned again in section 3 of this report. The writer will only be using one year's worth of data from the 2017 fiscal/academic year. This is to shorten the report for the tight time window.

2.2 Data Description

– **Math and Reading Proficiency in Iowa by School Year:**

The total storage space of this structured dataset is 48KB. It contains 610 records and 14 attributes. However, the writer won't be using all of the 14 attributes in this report. Some were deemed irrelevant to the analysis and report. With that in mind, the attributes to be used for analysis are as follows with the datatype shown in parenthesis behind the attribute: School Year(Number), Topic(Text), Grade(Number), District(Text), District Name(Text), Percent Proficient(Number), Proficient Category(Text).

– **Iowa School District Expenditures by Fiscal Year:**

The total storage space of this structured dataset is 366KB. It contains 3509 records and 13 attributes. However, the writer won't be using all of the 13 attributes in this report. Some were deemed irrelevant to the analysis and report. With that in mind, the attributes to be used for analysis are as follows with the datatype shown in parenthesis behind the attribute: Year(Number), Dist(Text), District Name(Text), Fund(Text), Expenditures Per Pupil(Number), Amount(Number), Enrollment Category(Text), Enrollment Category Number(Number).

3 Data Cleaning/Manipulation using SQL

4 Exploratory Data Analysis

5 Machine Learning in Python - Correlation

6 Tableau Visualization of Results

7 Conclusion

□

References

1. Dhaliwal, T.K., Bruno, P.: The rural/nonrural divide? K–12 district spending and implications of equity-based school funding. aera Open **7**, 2332858420982549 (2021), DOI: 10.1177/2332858420982549
2. Johnson, J.: More doesn't mean better: Larger high schools and more courses do not boost student achievement in iowa high schools. Rural School and Community Trust (2006), ERIC Document: ED491173