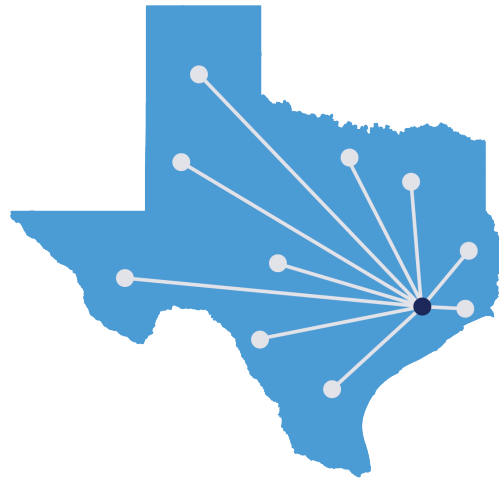# Bridging the Data Gap: Empowering Texas School Districts with Analytics

DistrictMatch

Team Kinder HERC

Rice University

1 Introduction

The Houston Education Research Consortium (HERC) is a partnership between the Kinder Institute for Urban Research at Rice and several school districts in the Houston area. HERC conducts data-driven research to help school districts improve academic and behavioral outcomes. Under their sponsorship, our project aims to facilitate the district comparison process by providing districts with a straightforward way to identify their closest demographic matches ("neighbors"), enabling more informed decision-making and strategic collaboration. Our ultimate goal is to create a dashboard that allows users to visualize, compare, and analyze school district data interactively, making insights more accessible and actionable.

Our team has developed a distance-based model to calculate the most similar districts in a way that is both efficient and understandable. The distance is calculated using race and ethnicity, special education, and other demographic variables. Users will be able to select what demographic variables with which they want to compare themselves to other districts. For example, if a dashboard user selected "Economically Disadvantaged Student Percent" and "Hispanic Student Percent," the distance would be calculated based on those two characteristics. The model then chooses the four districts with the smallest distance as neighbors.

2 Choosing a Distance Metric

There are different methods to calculate distance, and each method identifies different districts as the most similar to the target school district. These different results can shape the outcomes that school district administrators see on our dashboard. Therefore, we hope to get feedback on what districts are preferable for you as a school district to ensure that the model works effectively for those who will be using it.

This document presents a list of neighbors identified by each metric. Some methods yield similar results—with many of the similar districts being the same—while others differ significantly. To aid in the process of choosing the most appropriate method for your school district, our team has prepared a set of charts that illustrate how these neighbors compare to yours in terms of demographics.

3 Direct Request for Feedback

We would greatly appreciate it if you could review the charts provided and offer your insights on the following:

- **Qualitative Evaluation:** Please examine the graphs closely and let us know if one method appears to output more reasonable and meaningful comparisons between districts.

- **Method Preference:** Which method do you feel best captures the similarity of districts based on your own experience and expectations?

- **Suggestions for Improvement:** Are there any aspects of the graphs or the underlying metrics that you feel could be improved to better support your decision-making process?

4 Visualizing Similarities

4.1 Economically Disadvantaged Students

To find similar school districts to Aldine ISD based on economically disadvantaged demographics, we calculated distance based on the percentage of students who are economically disadvantaged and who qualify as Title I. Here are the results of that model.
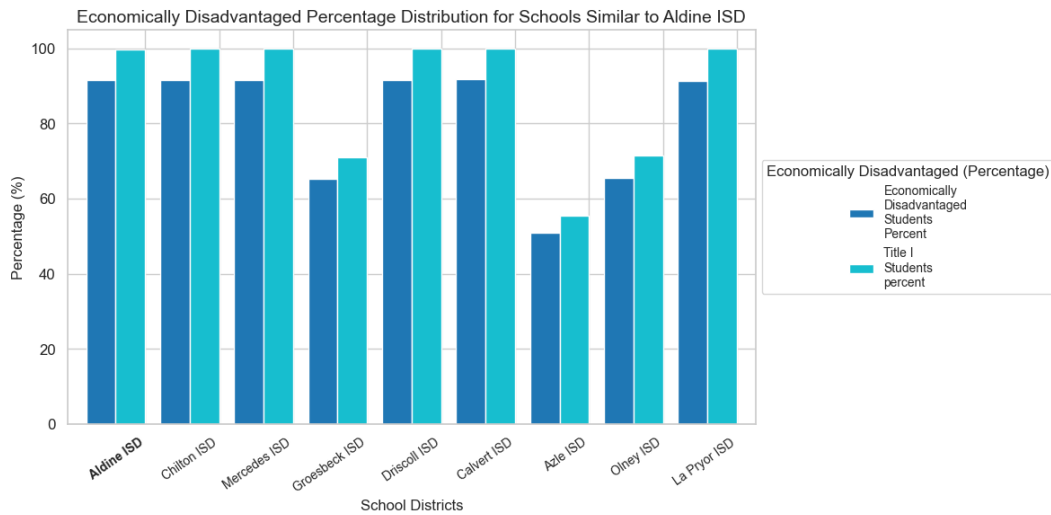
Figure 1: The percentages of economically disadvantaged students of Aldine ISD's neighbors, identified by 5 different distance calculation methods and using only economic disadvantage variables.
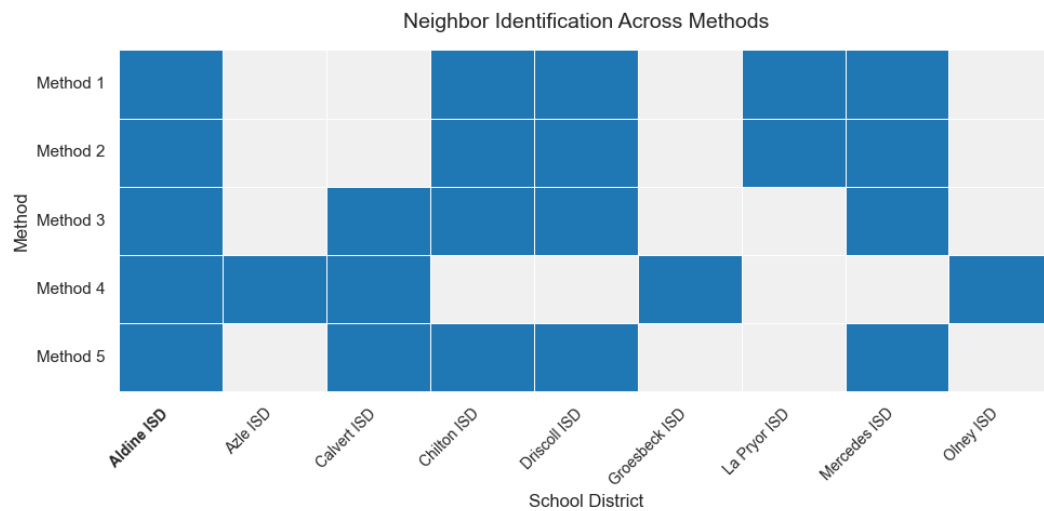
Figure 2: Aldine ISD's neighbors, identified by 5 different distance calculation methods and using only economically disadvantaged variables.

4.2 Student Race and Ethnicity

To find similar school districts to Aldine ISD based on race and ethnicity demographics, we calculated distance based on the following groups: African American, American Indian, Asian, Hispanic, Pacific Islander, White, and Two or More Races. Here are the results of that model.
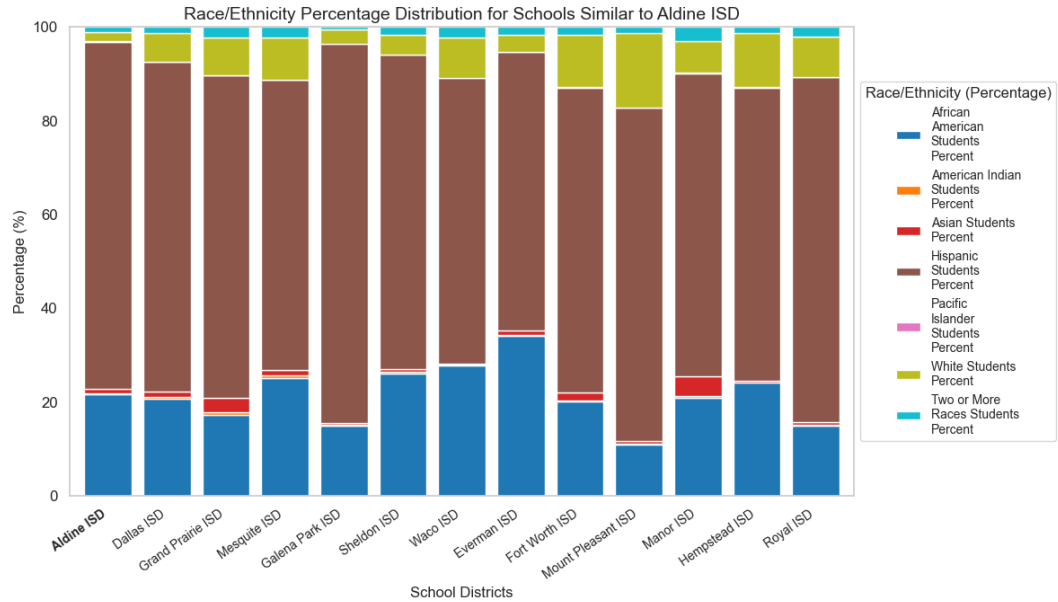

Figure 3: The percentages of students by race and ethnicity of Aldine ISD's neighbors, identified by 5 different distance calculation methods and using only race and ethnicity variables.
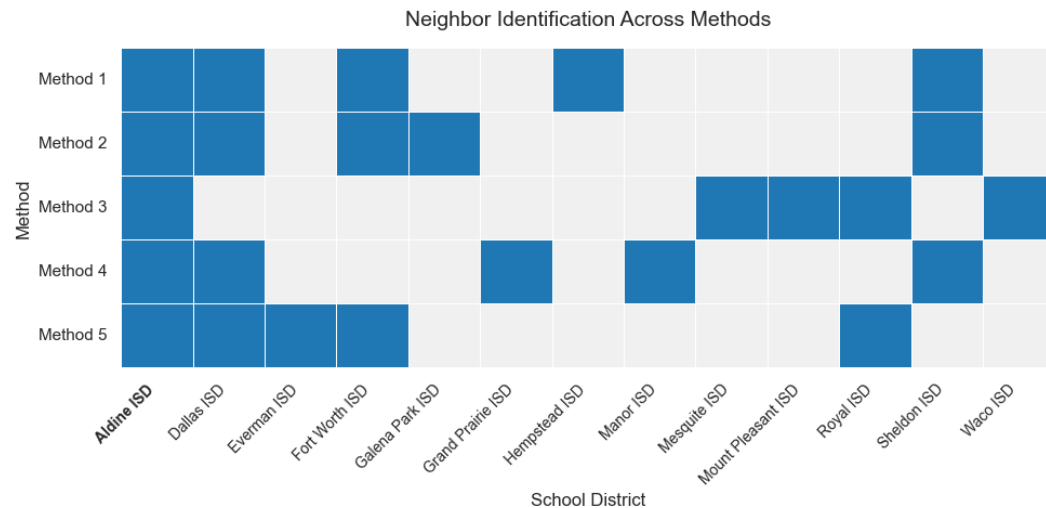
Figure 4: Aldine ISD's neighbors, identified by 5 different distance calculation methods and using only race and ethnicity variables.

4.3 Special Education and 504 Students

To find similar school districts to Aldine ISD based on special education and students with disabilities, we calculated distance based on the percentage of students in special education and those with 504 plans. Here are the results of that model.
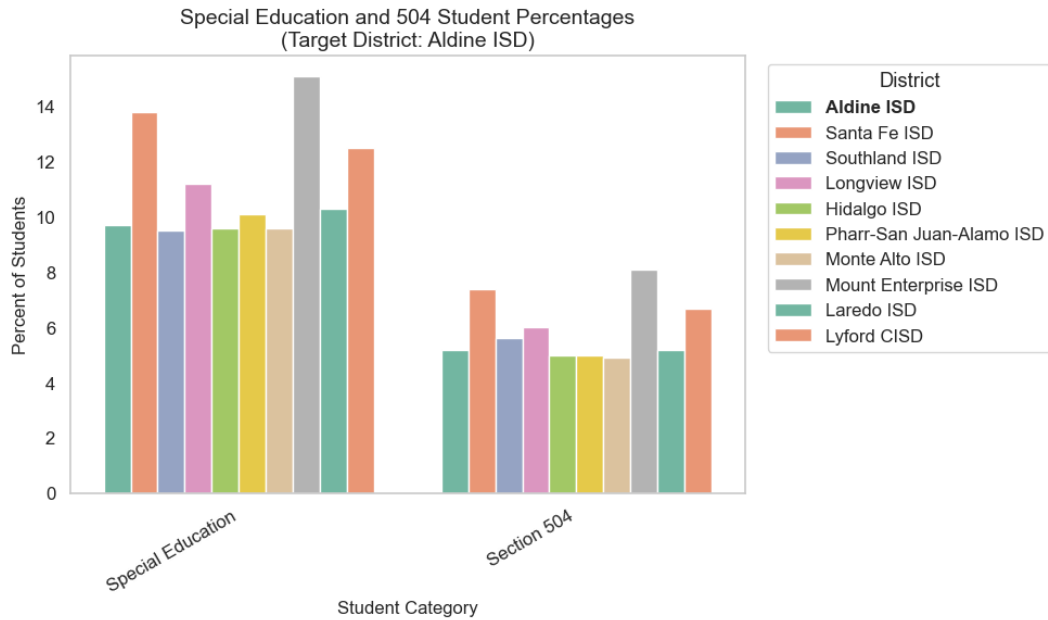

Figure 5: The percentages of students by special education percentage of Aldine ISD's neighbors, identified by 5 different distance calculation methods and using only special education variables.
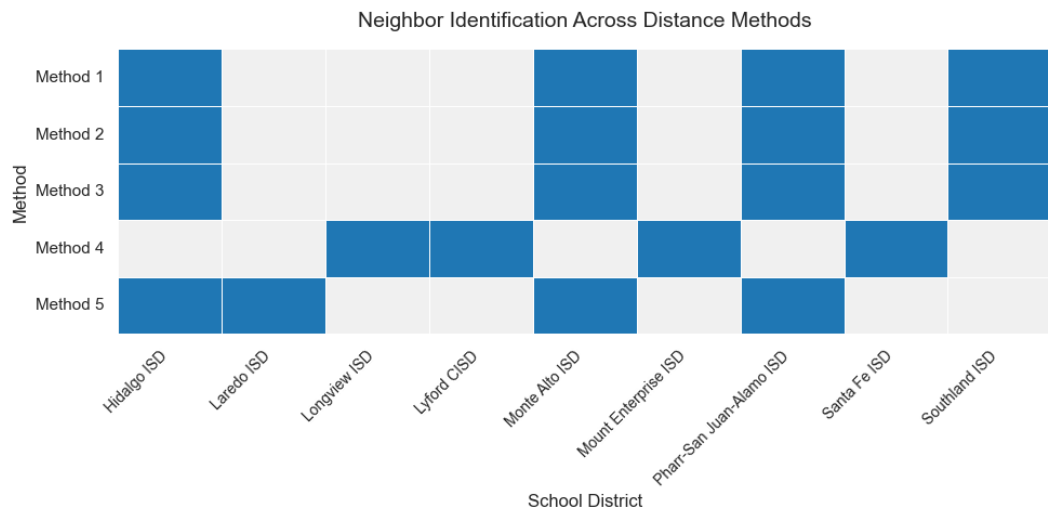

Figure 6: Aldine ISD's neighbors, identified by 5 different distance calculation methods and using only special education variables.

4.4   Student Special Populations

To find similar school districts to Aldine ISD based on the percentage of students belonging to special populations, we calculated distance based on the percentage of students who are: homeless, immigrants, migrants, military-connected, and in foster care. Here are the results of that model.
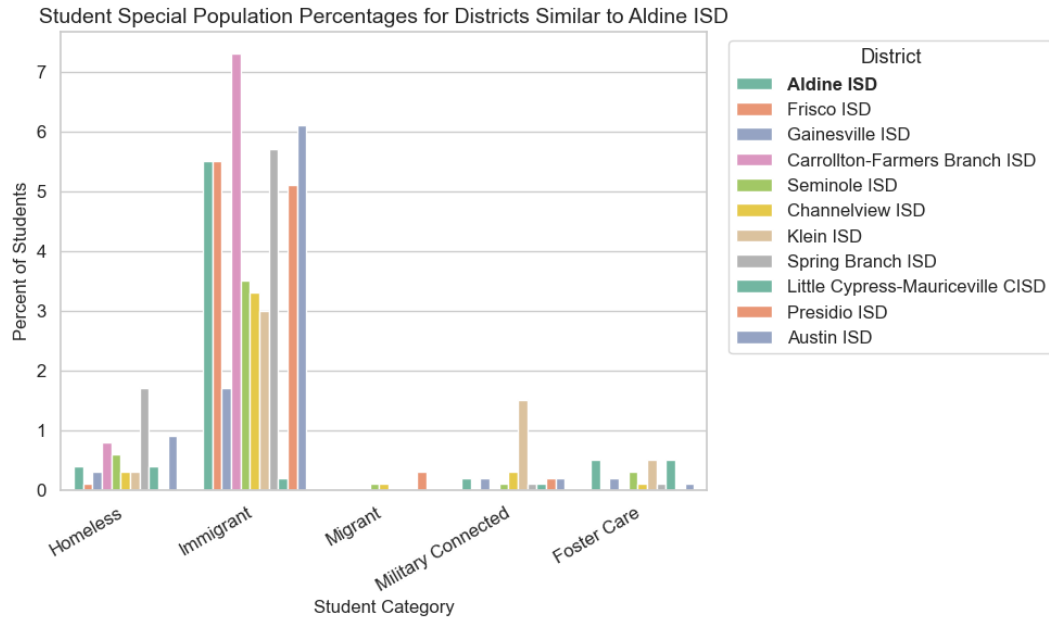

Figure 7: The percentages of students by special population of Aldine ISD's neighbors, identified by 5 different distance calculation methods and using only special population variables.
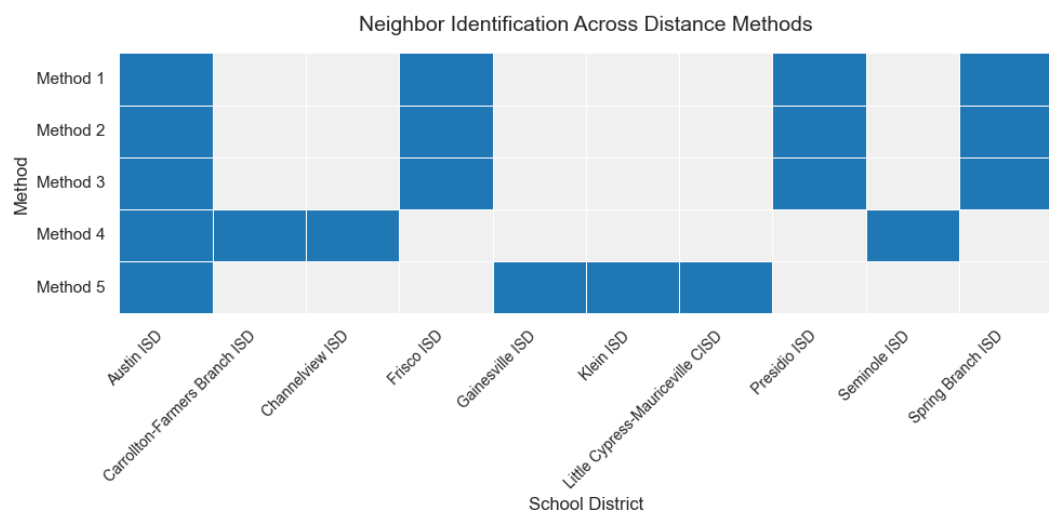

Figure 8: Aldine ISD's neighbors, identified by 5 different distance calculation methods and using only special population variables.

4.5 District Size

To find similar school districts to Aldine ISD based on the district size in terms of the number of staff and students, we calculated distance based on the total number of students and the total number of full-time equivalent staff. Here are the results of that model.
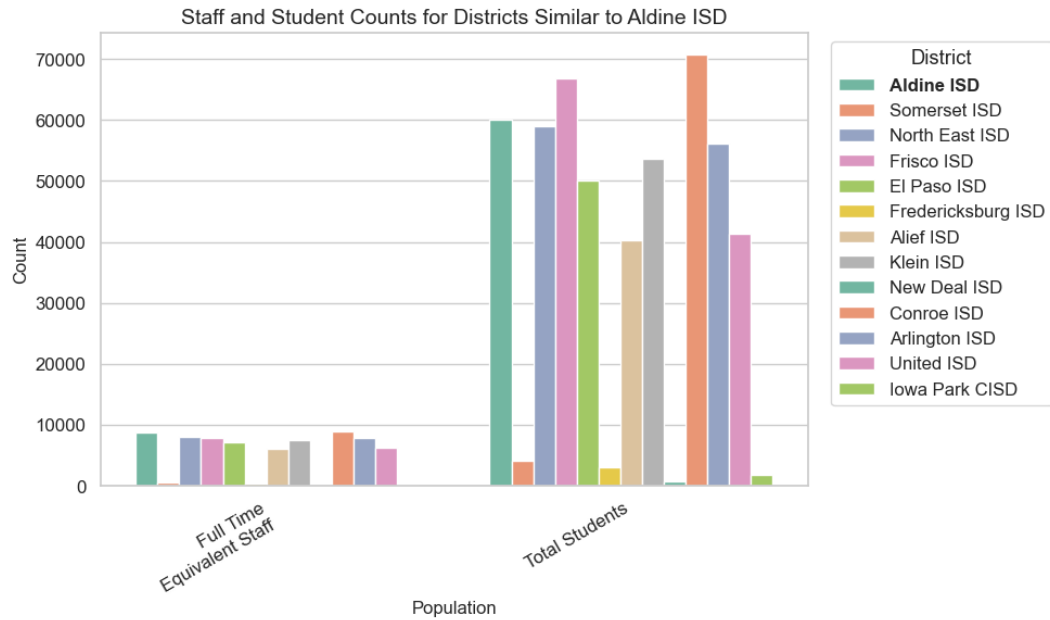

Figure 9: District size of Aldine ISD's neighbors, identified by 5 different distance calculation methods and using only staff and student count variables.
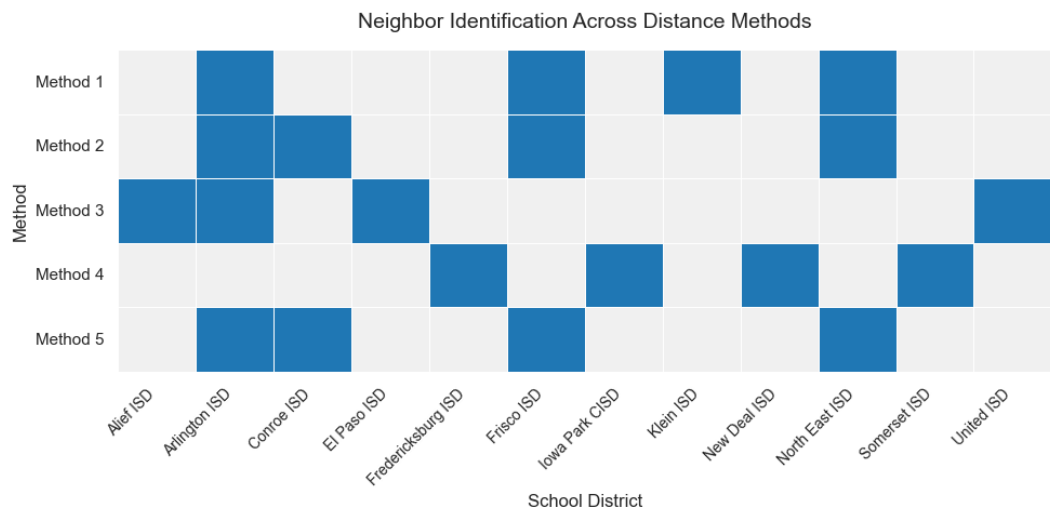

Figure 10: Aldine ISD's neighbors, identified by 5 different distance calculation methods and using only staff and student totals variables.

4.6 Language Education Percentage

To find similar school districts to Aldine ISD based on the percentage of students in different language education and bilingual classifications, we calculated distance based on "Bilingual/ESL Education Students Percent" and "Emergent Bilingual/English Learner Students Percent." Here are the results of that model.
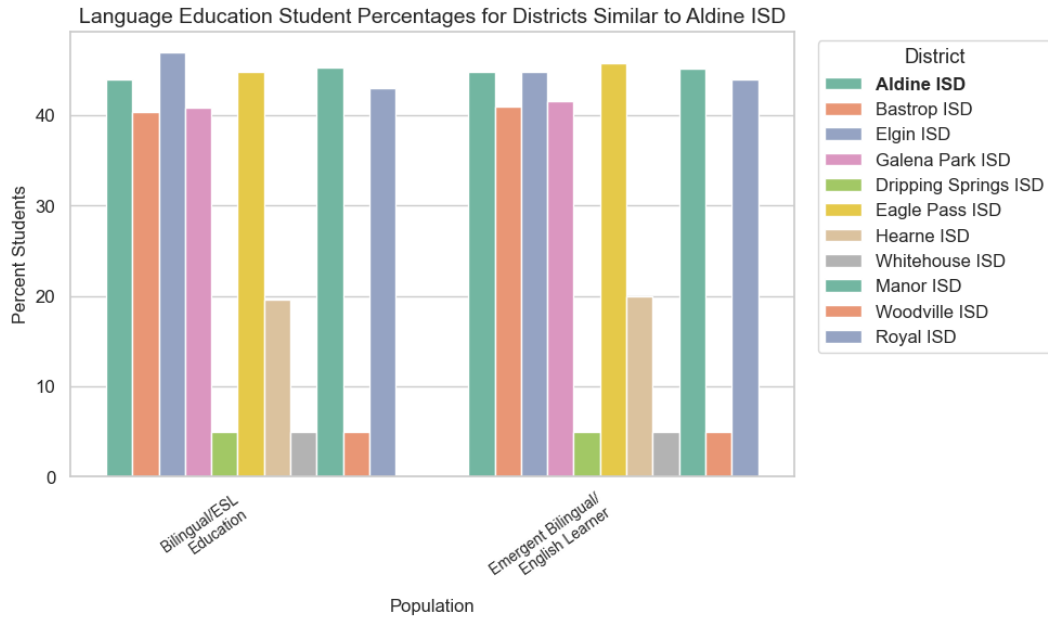

Figure 11: The percentages of students by language education classification of Aldine ISD's neighbors, identified by 5 different distance calculation methods and using only language education variables.
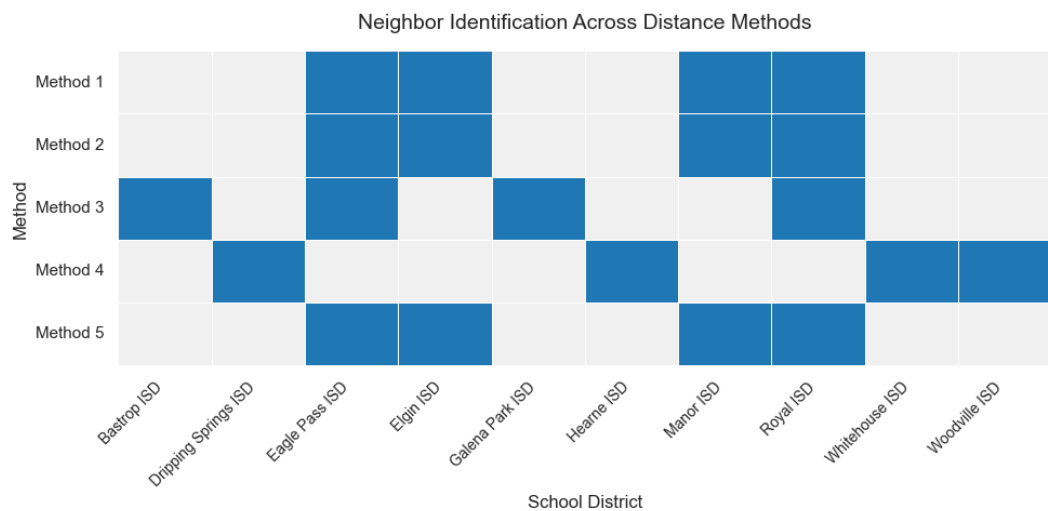

Figure 12: Aldine ISD's neighbors, identified by 5 different distance calculation methods and using only language education variables.

4.7 Other Variables

Unlike the sections above, which identified similar school districts based on a single grouping of characteristics, the following visualizations were created based on a model that utilized all available demographic features (22 different columns) to find nearest neighbors to Aldine ISD. Here are the variables used to determine similar districts to Aldine ISD.

- Student to Teacher Ratio

- District Student Count

- District Staff Count

- School District Race/Ethnicity Makeup

- Economically Disadvantaged Students

- Special Education and 504 Disability Student Populations

- Language & Bilingual Education

- Special Populations (Homeless, Immigrant/Migrant, Military, Foster Care)
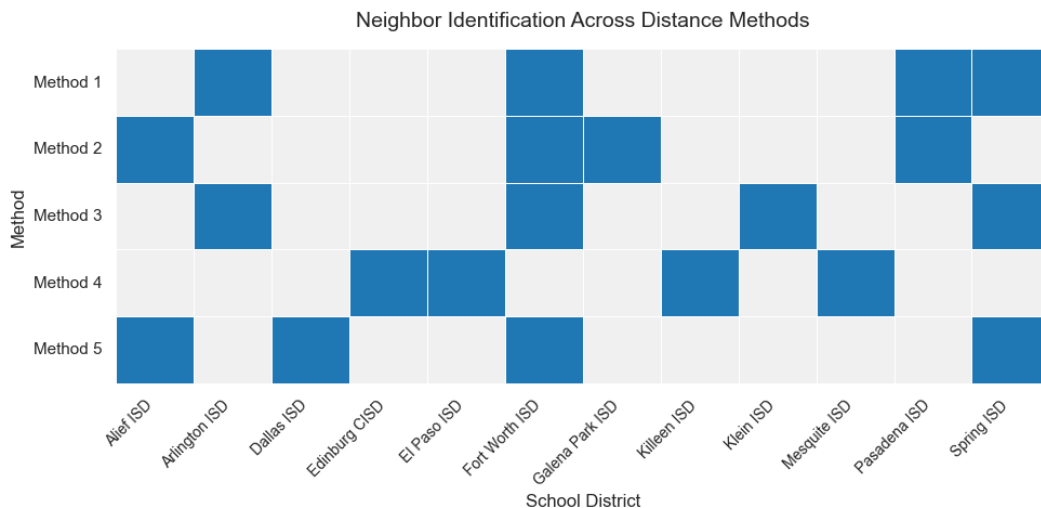
- Gifted Students

See results here:

Figure 13: Aldine ISD's neighbors, identified by 5 different distance calculation methods and using all possible demographic variables.
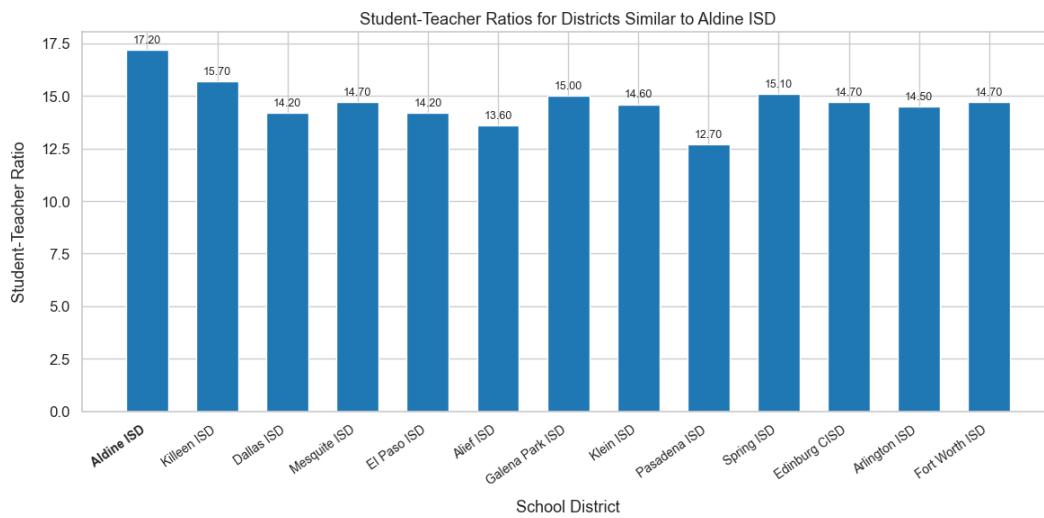
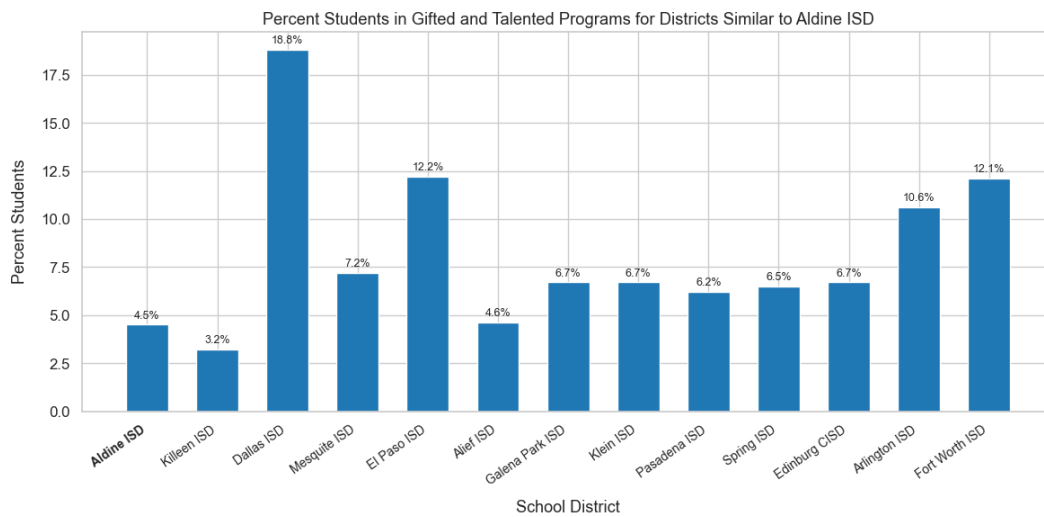Figure 14: The student-teacher ratio of Aldine ISD's neighbors.

Figure 15: The percent of students in gifted & talented programs. These school districts are Aldine ISD's neighbors.