Title: Examining and Elucidating Chronic Absenteeism Trends in Douglas County, Omaha, NE (2019-2020 to 2023-2024) for Grades 1–12

Project Description

Class attendance is a cornerstone of academic success, significantly impacting the quality of learning, student motivation, and overall educational outcomes. Research from the U.S. Department of Education highlights that students with regular attendance are 20% more likely to achieve proficiency in math and reading compared to their peers with chronic absenteeism [1, 2, 3]. Furthermore, consistent attendance fosters a sense of routine and accountability, enhances engagement with teachers and peers, and provides access to critical resources and support systems [4]. These factors collectively contribute to higher motivation and better learning retention [2].

However, maintaining class attendance faces several challenges. Socio-economic barriers, such as lack of transportation and unstable housing, are significant factors preventing regular attendance [5, 6]. Additionally, bullying, mental health issues, and insufficient school engagement can discourage students from attending classes [7, 8, 9].

The COVID-19 pandemic exacerbated these problems in the United States. School closures and the transition to remote learning disrupted routines, leading to a sharp increase in absenteeism [10]. Chronic absence, defined as missing 10% or more of school days, nearly doubled from 16% before the pandemic to nearly 30% by the 2021-22 school year, affecting 14.7 million students [11]. Many students struggled with limited access to technology and internet connectivity, compounding learning gaps and further deterring attendance. Addressing these issues requires targeted interventions and support systems to rebuild attendance rates and mitigate long-term impacts [12].

Douglas County in Nebraska comprises over 31% of the state's student population, including districts such as Omaha Public Schools, Elkhorn Public Schools, Douglas County West Community Schools, Millard Public Schools, Ralston Public Schools, Bennington Public Schools, and Westside Community Schools. Chronic absenteeism has been a pressing issue, with reports from KETV [13] indicating that over 40% of Omaha Public Schools students were chronically absent in the last academic year. According to Nebraska Public Media [14] in 2022, the COVID-19 pandemic has amplified these challenges, worsening mental health issues and intensifying hardships for students already living below the poverty line. Absences have impacted rural, suburban, and urban schools alike, disrupting not only academic progress but also social development, as students who miss class frequently face heightened feelings of anxiety and isolation. Despite these challenges, some schools are actively implementing measures to counteract the effects of years of escalating absenteeism.

This proposal seeks funding to systematically investigate chronic absenteeism patterns across seven school districts in Douglas County, Omaha, NE, over a five-year period (2019-2020 to 2023-2024). The central hypothesis is that chronic absenteeism significantly impacts the quality of learning, school engagement, and district absenteeism policies, and that these impacts can be mitigated through targeted interventions informed by detailed data analysis.

Specific Aims:

1. To establish robust methods for data collection, preparation, and preprocessing, and to develop a standardized dataset that enables comprehensive analysis of absenteeism trends across diverse school districts from 1st to 12th grade across Douglas County.
2. To perform comprehensive statistical analysis and develop advanced data visualizations to identify trends across districts and grade levels, enabling a deeper understanding of absenteeism patterns and their underlying factors.
3. To analyze the effects of absenteeism policies, learning quality metrics, the impact of COVID-19, and other contributing factors on attendance and educational outcomes, identifying key areas for improvement and actionable recommendations.

This study will employ advanced statistical analysis and data visualization techniques to generate actionable insights. The findings aim to provide educators and policymakers with evidence-based recommendations for addressing absenteeism and promoting equitable access to quality education.

Methodology

The first aim will focus on collecting available data sources from entities such as the Nebraska Department of Education, public news archives, and relevant reports. This phase will involve extracting and consolidating data on student absenteeism across Douglas County, segregated by grade levels from 1st to 12th in Omaha Public Schools, Elkhorn Public Schools, Douglas County West Community Schools, Millard Public Schools, Ralston Public Schools, Bennington Public Schools, and Westside Community Schools. Additionally, advanced data preparation and engineering techniques will be employed to clean, preprocess, and structure the data into a standardized dataset suitable for analysis. This will include handling missing data, ensuring consistency in data formats, and creating derived variables as needed to enhance interpretability. The dataset will also incorporate contextual variables such as district policies and risk factors between 2021 and 2024, enabling a comprehensive analysis of the impact of these factors on absenteeism trends and educational quality in Nebraska and Douglas County.

For the second aim, we will utilize a modern programming language, Python [15] for conducting statistical analyses and generating corresponding scripts. These methods will be designed to identify trends in the data and extract critical insights. Key steps will include marking dates associated with identified risks during the study period. We will employ appropriate statistical techniques such as testing for normality and homogeneity, and conducting Independent T-Tests (or alternative methods like the Mann-Whitney U test or Welch's t-test), as well as ANOVA for comparing groups. Advanced data preparation and preprocessing techniques, including feature engineering and outlier detection, will ensure robust and reliable results. For data visualization and reporting, we will leverage powerful Python libraries to create detailed and clear plots to enhance reports . Finally, in alignment with the third aim, we will investigate correlations between absenteeism trends and district policies, the impacts of COVID-19, and other systemic challenges.

In the final aim, we will analyze absenteeism trends, identify underlying causes such as the effects of COVID-19, district policies, and other factors influencing attendance rates, and examine their impact on learning quality, teacher performance, and systemic challenges within schools. Additionally, we will explore relevant policies, review news reports, and evaluate district-level strategies in relation to educational outcomes. Additionally, we will evaluate the role of digital

tools, such as software and smartphone applications, in mitigating the educational disruptions caused by school closures or prolonged absences. These tools will be assessed for their efficacy in improving student engagement, providing continuity in learning, and supporting personalized educational strategies. Furthermore, we will explore the broader social impacts of absenteeism on families and parents, including challenges in balancing work and supporting students during periods of extended absences. This comprehensive approach aims to provide actionable insights to reduce absenteeism and improve systemic support mechanisms for all stakeholders involved.

Broader Impact

The proposed work is significant because understanding the patterns and causes of chronic absenteeism provides a foundation for addressing one of the most pressing barriers to academic success and equity in education. Chronic absenteeism not only disrupts learning but also compounds socio-demographic disparities, leaving vulnerable populations at an even greater disadvantage. By examining trends across diverse school districts, this research aims to uncover actionable insights that inform effective strategies for intervention. Furthermore, the study will explore innovative approaches to developing software and smartphone applications designed to support learning during periods of absence. These tools will aim to provide interactive educational resources, real-time communication between students and teachers, and personalized learning plans to mitigate the adverse effects of missing school. The findings will enable policymakers, educators, and community stakeholders to create data-driven programs tailored to improve attendance rates and foster equitable educational opportunities.

Roles of Student and Faculty Mentor

The student will be responsible for analyzing and managing data, running the statistical models, generating results and graphs, and preparing a presentation. The faculty mentor will work with the student give feedback on the methods, help solve research challenges, review the results, and provide overall direction and supervision of the project. He will also help the student prepare the presentation.

Project Timeline

	Weeks											
Title	**1**	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**10**	**11**	**12**
Aim1 : Prepare Data												
Data collection, preparations												
Aim2 : Statistical Analysis												
Violation assumption tests												
T-Test and other statistical methods												
Aim 3: Analyzing and Reports												
Data visualization												
Reports and Presentation												

Budget Justification

Student Stipend $5,000.00 (360 hours at $14/hour) - 30hr/week

The graduate student Nagesh Palukuruwill be responsible for this research and results.

References

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[15] A. Rawat, "A Review on Python Programming," *International Journal of Research in Engineering, Science and Management,* vol. 3(12), pp. 8-11, 2020.

To GRACA Review Committee:

It is my pleasure to support Nagesh Palukuru's GRACA proposal entitled "Examining and Elucidating Chronic Absenteeism Trends in Douglas County, Omaha, NE." The issue addressed by this proposal is important and highly relevant to our mission as an urban university.

Chronic absenteeism is a critical issue in the education community. As is highlighted in the proposal, there are numerous negative effects from students skipping school. However, there are opportunities unique to our community. As we have different school districts, different COVID policies resulted in different changes in rates of absenteeism. Moreover, policy makers (in this case the districts) tend to be more reactive to results that are based on their data versus others that they can argue are not representative.

As a data science student, Mr. Palukuru has the skills necessary to complete this project successfully. Moreover, the data necessary for the project exists, it just needs to be collected from the schools; we do not expect addition direct costs in collecting the data. Therefore, the project has a high likelihood to succeed.

Mr. Palukuru will consult with me on each stage of the research project. We will hold regular meetings, and I will guide him on the best empirical approaches to answer each of his research questions. Moreover, we will discuss the best way to communicate his results to stakeholders (the districts) so this research could be used in policy decisions.

Please let me know if you have any questions,

B. Smith

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