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## High School Environment in the Clark County School District

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# High School Environment in the Clark County School District

Oscar Canale, John David Reyes, Asia Sunga, Jay Tumanan

## Intro/Summary

Our group was interested in analyzing the high school public education system in the Clark County School District. As Las Vegas residents, it is important to know how the schools in our city are being affected, especially since many of us went to school here. It is also detrimental to know as it could potentially be the schools of our future children and generation. We took data from the 2017-2018 school year and decided to model the total index score of each high school based on four different variables. Chronic absenteeism is defined as the percentage of students in the school who missed 10% or more school days in the school year. Proficiency average refers to the percentage of the student body who are proficient in basic science, math, and English. CCR completion, or college career readiness completion is the percentage of students who completed a college and career readiness program. Lastly, the high school graduation rate 4-5 is the graduation rate of students from the high school after 4 or 5 school years attending it. We built a model and used STATA to create the descriptive statistics and empirical results. We also created scatterplots and bar charts to clearly see the relationships between the variables if there are any.

## Methods/Model

We will conduct multiple linear regression on data retrieved from high schools in the Clark County School District. Expected signs and definitions of our variables can be found in the table below.

Multiple Regression Model		
Studying the Impact of Educational and Economic Variables on Index Score		
N = 46 Clark County High Schools		
	Definition:	Expected Sign
<b>Dependent Variable:</b>		
Index Score	The total index score of a school based on graduation rates, proficiency, etc.	
<b>Independent Variables:</b>		
Proficiency Average	Average subject proficiency (%) of students per high school	+
CCR Completion	College & career readiness completion (%) of students per high school	+
High School Grad. Rate	Average graduation rate (%) of students per high school	+
Chronic Absenteeism	Average absenteeism (%) of students	-
Title 1 Status	1 if the school qualifies as a Title 1 school 0 if the school does not qualify as a Title 1 school	-

### TWO MODELS:

Student behavior model:  
 $Index\ Score = \beta_0 + \beta_1(Pf_{cy}) + \beta_2(CCR) + \beta_3(Grad) + \beta_4(Absent) + \epsilon$

Economic consideration model:  
 $Index\ Score = \beta_0 + \beta_1(Pf_{cy}) + \beta_2(CCR) + \beta_3(Grad) + \beta_4(Absent) + \beta_5(T1) + \epsilon$

The student behavior model scores high schools based off student performance and behaviors. The second model considers the economic status of the school and how it may or may not affect index scores.

## Data/Analysis

Variable	Obs	Mean	Std. dev.	Min	Max
TotalIndex	49	65.8592	15.8445	13.5	101.5
ChronicAbsen	49	23.48943	12.09093	5.2	48.9
HighSchool	49	87.12245	31.17946	29.5	100
CCRCompletion	49	34.36322	26.56733	6	99.7
ProficiencyAverage	49	35.48838	16.21880	6.2	76.4
Title1Status	49	.6570612	.4869288	0	1

Figure 1. Summary Statistics of All Variables

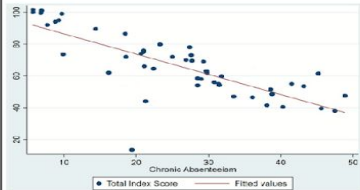


Figure 3. Scatter Plot: Total Index Score & Chronic Absenteeism

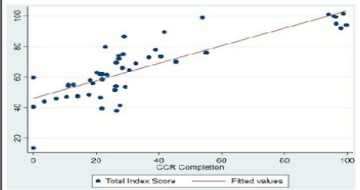


Figure 5. Scatter Plot: Total Index Score & College Career Readiness Program Completion

Variables	No Title 1		Title 1 Status		Difference (Mean)
	Mean	SD	Mean	SD	
Total Index	76.6	15.9	59.1	16.6	19.5
Chronic Absenteeism	17.0	7.3	29.9	12.0	-12.0
High School Grad Rate	93.9	7.4	85.1	12.4	9.8
CCR Completion	41.1	26.0	30.6	26.5	10.4
Proficiency Average	51.1	13.2	27.1	14.7	24.1

Figure 2. No Title 1 & Title 1 Summary Stats Comparison

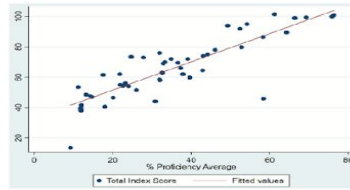


Figure 4. Scatter Plot: Total Index Score & Proficiency Average

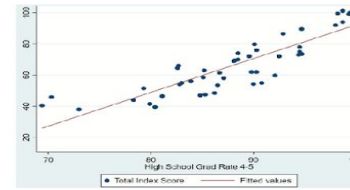


Figure 6. Scatter Plot: Total Index Score & High School Graduation Rate

	TotalIndex	ProficiencyAverage	CCRCompletion	HighSchool	ChronicAbsen	Title1Status
TotalIndex	1.0000					
ProficiencyAverage	0.5062	1.0000				
CCRCompletion	0.8290	0.7222	1.0000			
HighSchool	0.8228	0.6263	0.5936	1.0000		
ChronicAbsen	-0.7716	-0.8248	-0.7348	-0.4305	1.0000	
Title1Status	-0.5157	-0.6218	-0.2088	-0.3079	0.4753	1.0000

Figure 7. Correlation Coefficient Matrix

Figures 1-2 show the summary statistics with all variables and the breakdown of summary statistics with Title 1 Status or not. Figures 2-7 demonstrate a strong relationship between the dependent variable and all independent variables, based on scatter plots and coefficient correlation matrix.

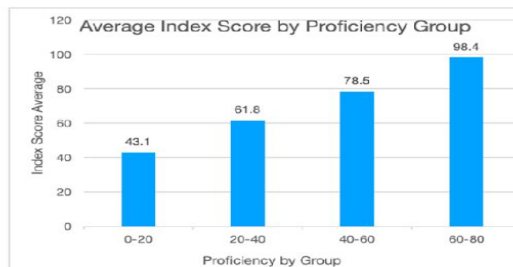


Figure 8. Average Index Score by Proficiency Group

## Results

### Key Findings

1.) The expected signs of our variables met expectations

- Average proficiency, college and career readiness completion, and high school graduation rates all had positive relationships with the index score
- Chronic absenteeism and title 1 schools had negative relationships with the index score

2.) Variable impact on total index score

- High school graduation rates had the strongest positive impact on the index score
- Chronic absenteeism was the only student behavior to decrease the index score
- High schools with a Title 1 status indicated significant decreases in the index score

3.) Significance of Variables and Models

- Four of our variables pass the significance test at either 0.10, 0.05, or 0.001 levels, indicating its significant affect on the dependent variable.
  - (Average proficiency, College and Career Readiness completion, Graduation Rates, passed at three star levels)
  - (Title 1 Status of the school passed at a two star level)
- Both models pass at a three star level, indicating they are fit to predict the index scores of high schools

4.) Our Models Explains Over 95% of the Variance in Index Scores

- R-squared (measure of variance explained by independent variables) explains 95.77% in the first model and 96.19% in the second model

Variables	Results			
	Student Behavior Model		Economic Consideration Model	
	Coefficient	P-value (sig. test)	Coefficient	P-value (sig. test)
Pfcy	0.4751	0.000 (***)	0.3801	0.000 (***)
CCR	0.1539	0.000 (***)	0.1896	0.000 (***)
High School Grad. Rate	0.0848	0.000 (***)	0.0825	0.000 (***)
Chronic Absenteeism	-0.1478	0.170	-0.1315	0.205
Title 1 Status	-	-	-3.7893	0.044 (**)
Constant	-11.7429		-7.4004	
Model Significance	0.0000 (***)		0.0000 (***)	
R <sup>2</sup>	0.9577		0.9619	

## Conclusion & Future Direction

The data shows that there is a positive correlation between Total Index Score and College Career readiness and Proficiency average. For future research, we would like to take this information and compare it with the transition rate of high school graduates to college. Our future goal is to break down the positively correlated factors and find the statistically significant variables the factor into college admissions and increase the average rate Nevadans achieving a higher education.

Further research needs to be done to explain the possible causal factors of chronic absenteeism. There is an obvious negative correlation between absenteeism and the index score that we would like to further investigate. The current goals of CCSD students is to maintain a standard 90 percent attendance for all their classes but we would like to consider what other factors cause students to be chronically absent and whether they have a causal relationship with graduation rates.

We would also like to venture into researching more on the effectiveness of the Title I status. Research done by Sousa and Armor in 2016 gathered data on the effectiveness on the Title I status on a national level and concluded that the program is costly and ineffective. Our data based in CCSD points to the same results showing that the funding provided to these schools are not closing the academic gap. With more research, we would hope to propose possible policies of where we could reallocate the fundings.

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