Cell phone policy and academic achievement in schools

AP Research

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ABSTRACT

Rouse High School adopted a new cell phone policy during the 2023-2024 school year where cell phones were prohibited in the school setting. Since the cell phone policy was newly introduced to this setting, the idea has proven to be very controversial in terms of how beneficial it is for the students. The following research paper attempts to explore the correlation, if any, between the cell phone policy and academic performance and learning environment at Rouse High School. The purpose of this research study was to identify the value of a cell phone policy in relation to an individual's academic prowess. A hypothesis was generated that with the enactment of the cell phone policy, the academic prowess will be greater. A mixed methods approach was used to identify if there was any correlation between the two variables. A preliminary survey was conducted to identify the perspectives of students at Rouse High School on the cell phone policy. Later once the data was compiled, a correlational analysis was conducted to measure the strength and direction of the linear relationship between the policy and academic achievement through the specific test averages for math and spanish courses through a two sample t-test. The relationship for math was found to be statistically significant, but the correlation between the variables for Spanish was found to be insignificant.

INTRODUCTION

The dictionary definition for a cell phone policy is defined as a set of guidelines that many workplaces and employers introduce to manage, limit or prevent the use of mobile phones at work (Weimer, 2018). Despite the growing use of smartphones and technology in an educational setting, there is a lack of the need to investigate how the implementation of the smartphone policy at Rouse High School affects students' academic performance and the overall

learning environment. This problem arises in the context of concerns about the influence of technology on students educational outcomes. A study examining the relationship between the smartphone usage policy and academic performance using a correlational and quantitative research approach may shed light on the potential impact of technology policies on educational equity at the high school level. This topic is very important because it is current and is affecting students at this moment. Identifying if enacting a cell phone policy is beneficial can help make educational decisions (ex: impose other types of policies). It is important that we are aware of the current circumstances because it is affecting our students at this specific time and can change our policies to make sure our academic performance and learning environment can be the best it can be because at the end we only want what is best for the students. The goal of this specific project was to determine whether the implementation of a cell phone policy could be utilized to achieve a significant increase in academic performance. The research question that was addressed is how does the implementation of a smartphone usage policy impact the academic performance and learning environment of students at Rouse High School.

LITERATURE REVIEW

In order to identify if there was a significant relationship between a cell phone policy being enacted and the correlation with the academic performance of students the significance is clearly seen in Buccino and Madden's studies. The study done by Buccino (2020) was conducted at Rutgers University and it revealed that when students were allowed to use electronic devices for non - academic purposes during classroom lectures, it negatively impacted their exam performances and final grades. In this study led by Arnold Glass and graduate student Mengxue Kang, the study included 118 cognitive psychology students. It found that while device use did

not affect comprehension test scores during lectures, it lowered the end-of-term exam scores by at least 5%. Interestingly even students who did not use devices but were in the class also did worse on the exams. The study highlighted that there was a detrimental effect on academic prowess due to electronic device distraction.

In correlation to Glass Study, the purpose of Madden's (2018) study was also to investigate how the frequency of smartphone use during a lecture affects test scores. Specifically in this study the researchers aimed to determine whether engaging in mobile phone distractions had negative effects on students' note taking behaviors and subsequent performance on exams. Madden and his teams wanted to understand whether students who used their mobile phones for texting and posting during lectures exhibited lower learning outcomes compared to those who did not engage in such distractions. The researchers collected data by using simulated classroom conditions. Participants watched a recorded lecture, took notes over the lecture, and were then tested on lecture content. The control group simply watched the lecture, took notes, and answered exam questions. The experimental groups engaged in the same activities as the control group but also participated in a simulated texting and Facebook interactions during the lecture. One experimental group had a lower frequency or texts/posts, and the other had a high frequency. This study was conducted in the United States, and it was shown that "93% of people who did not use their mobile phones frequently had better test scores" (Madden, 2018). Ultimately Madden and Glass came to the conclusion that the increase in cell phone use during a learning day leads to a decrease in academic performance at different levels.

When looking at the broad level of cellphone usage and its effect on personal relationships, studies done by Subrahmanyam and Greenfield (2008) focus on adolescent relationships with friends and strangers. The purpose was to identify the relationship between

online communications and adolescent relationships. Since technology has been significantly important in the lives of adolescents, Subrahmanyam and Greenfield tried to identify adolescents' relationships with friends, romantic partners, strangers, and family members. The collection of data was done through surveys among adolescents' interactions with strangers during the early use of the internet. They also compared how social media relationships have been altered by electronic media which is backed up by qualitative evidence. They have found that electronic communications have intrinsically changed social relations. On top of that they have found that there is a higher proportion of teens through a writing platform of social media. In terms of electronic media and parental influence, adolescents and parents agree that youth know more about the internet than parents do. 66% of parents agreed to this claim.

Kuznekoff (2012) wanted to see if there was a correlation between demographics and the socio economic differences that play a role in internet access between higher and lower classes. The researcher collected data by sampling a nationally representable sample of teenagers aging 12-17 and their parents to view the board trends in teen population. The results found that cell phone ownership was widespread, with 78% of teens having a cell phone, 47% owning smartphones, and most teenagers (93%) had access to a computer at home, and 71% shared devices with other family members. Mobile internet access was also very common, with 74% of teens accessing the internet on mobile devices, 25% being "cell mostly" users. Notably, older girls were more likely than boys in their same age group to primarily use their cell phones for internet access. 34% of teen girls aged 14-17 fell into this category.

A quasi experiment done by Tanil (2020) identified how the presence of smartphones affects learning and memory among undergraduates. A total of 119 participants completed a memory task and the SAS (Smartphone Addiction Scale). Results indicated that individuals

without smartphones exhibited higher recall accuracy compared to those with smartphones. Furthermore, there was a significant negative relationship between phone conscious thought and memory recall, with phone conscious thought significantly predicting memory accuracy. Overall, the study suggests that the presence of a smartphone and high phone consciousness can adversely affect learning and memory, highlighting the negative impact of smartphone proximity on cognitive learning processes and the disruptive nature it has on the learning environment.

In relation to Tanil's study, another quasi-experimental study done on 106 psychologically well-being students aimed to identify if a cell phone ban affects students comprehension and wellbeing. Those whose phones were placed at the front of the desk showed higher comprehension, lower anxiety, and higher mindfulness (Liu, 2022). The finding suggests limiting smartphone usage in class could improve learning and student mental health which can allow for the guidance of educators in curriculum design. The people who had no smartphone use had higher levels in comprehension and mindfulness. The students that did not have restrictions had lower levels of comprehension and mindfulness (Liu, 2022).

Buccino's study revealed that allowing electronic device use during classroom instruction negatively impacted students' exam performances and final grades. This greatly coincided with Glass and Kang's study as it found that while the use of devices did not affect comprehension scores during lectures, it lowered end-of-term exam scores. Both studies highlighted a detrimental effect of electronic devices on academic performance at the undergraduate level. Across the studies there is a consignment theme of negative effects associated with excessive cell phone use.

Despite this valuable pre-existing research, none of it addresses the effect of a cell phone ban being placed on high school students, specifically students at Rouse High School. All the

previous studies have been done at the undergraduate level (Kuznekoff, Tanil, Buccino, Madden). The purpose of this study is to address this knowledge gap. A knowledge gap is defined as a missing piece of understanding, or a question mark hanging over a field of research. The gap statement specifically is that though there is extensive research on this subject, there has not been a focus on the specific effect of the cell phone policy on academic prowess of high school students at Rouse High School. The purpose of this study is to determine if the implementation of a cell phone ban at Rouse High School can affect the academic achievement and learning environment of students attending this high school. To analyze the effect of the ban being placed, the guiding research question is: how does the implementation of a smartphone usage policy impact the academic performance and learning environment of students at Rouse High School?

"Academic prowess is very important" (Dash, 2011). How well you academically succeed can potentially affect your future, and open up opportunities. For example, people who excel academically will more likely get into better colleges and get better jobs. By studying if placing a cell phone policy can affect academic achievement we can have the possibility to make sure we are amplifying students academic prowess to make sure we are making sure everyone's academic achievement is the highest it can be.

METHODOLOGY

The method I chose to do was a mixed-methods approach consisting of a survey and a correlational analysis portion. To gather participants for my survey I sent it out on platforms such as Instagram, Snapchat, Linkedin, and more. The reason I chose a survey is because they allow large populations to be assessed with ease. It was also used in various other pre-existing

literature like in Miller's study on overall happiness levels due to cell phone bans (Miller, 2016). The survey was created on google forms, which is an online administration software. The survey consisted of various things. It started off with an agreement for the use of the collected data to be used in my paper. Next, I asked for personal information like age, grade level, school and email. These questions allowed me to filter out respondents who did not fall within students that are attending Rouse High School. There were 15 questions in total with a combination of multiple-choice and open ended questions. A few questions I asked were (1) What is your hardest class, and are cell phones allowed in that class? (2) What is your easiest class, and are cell phones allowed in that class? (3) Are you aware of your school's current cell phone policy? (4) Do you feel like teachers abide by the cell phone policy? (5) On a scale of academic achievement, how would you rate yourself? (this was an optional question but all my respondents answered this question except for one respondent). (6) Do you believe that a stricter cell phone policy would positively impact your academic performance? (7) Have you ever experienced negative consequences (e.g., lower grades, missed assignments) due to excessive cell phone use during class? (8) Do you believe the cell phone policy has increased your grades? (9) Have you ever felt pressured to respond to messages or notifications on your cell phone during class time? (10) Can you share any strategies you use to stay focused on academic tasks despite the presence of cell phones in the classroom? (11) Do you see a difference in concentration after the enforcement of the policy?

For the second portion of my methodology, I conducted a correlational analysis to understand if there was a correlation between my variables of cell phone use and academic results. I started by identifying which classes strictly abided by the cell phone policy and which classes did not. From my survey, I found that AP Spanish had a class period that abided by the

cell phone policy and a class period that did not. I also found this was the same for two AP Statistics classes.

Once I obtained an idea of what classes I wanted to take, I went to each teacher to ask if they were willing to share data. Thankfully, the teachers for both AP Statistics and AP Spanish were willing to take part. For AP Spanish 1st period abided the cell phone policy, and 3rd period did not. I took the class averages for four test scores and took the average of that. For the first period I did the same, and took the average of four test scores for third period AP Spanish. The tests were the exact same for each class period. For AP Statistics I did the same. However for AP Statistics, 5th period abided by the policy and 6th did not. Regardless , I took the class averages for six test scores and took the average of that for the fifth and sixth period separately.

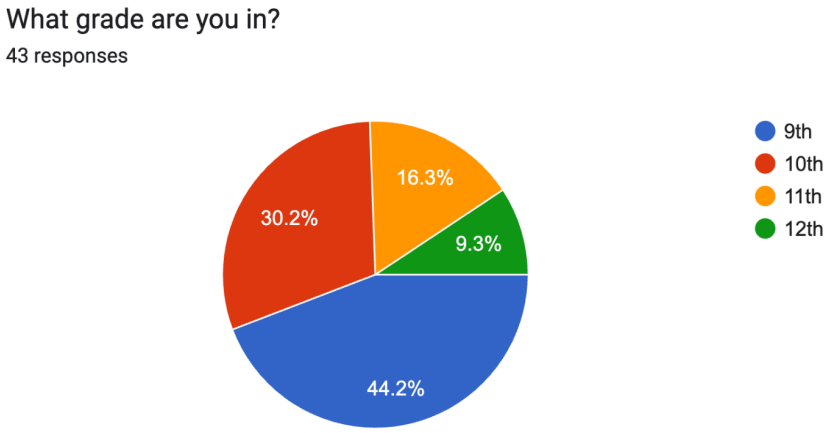
In order to ensure discrepancy, the teachers each sent me a google doc with test scores labeled student #1, student #2, student #3, etc so I do not know the grades of students. The teachers would remove the students name and replace it with student number to ensure discrepancy. This way I would be able to analyze if there was a correlation between my variables while being blinded.

By incorporating a correlational analysis and a survey approach in my mixed - method, I would be able to identify the students perspective on the cell phone policy but I would be able to identify if there were significant shown effects. I want to measure the change in academic prowess due to cell phones and see if there was a change from last year to the current school year. This approach to my research question (how does the implementation of a smartphone usage policy impact the academic performance and learning environment of students at Rouse High School) contributes to the existing body of knowledge in this specific topic and furthers research in this field.

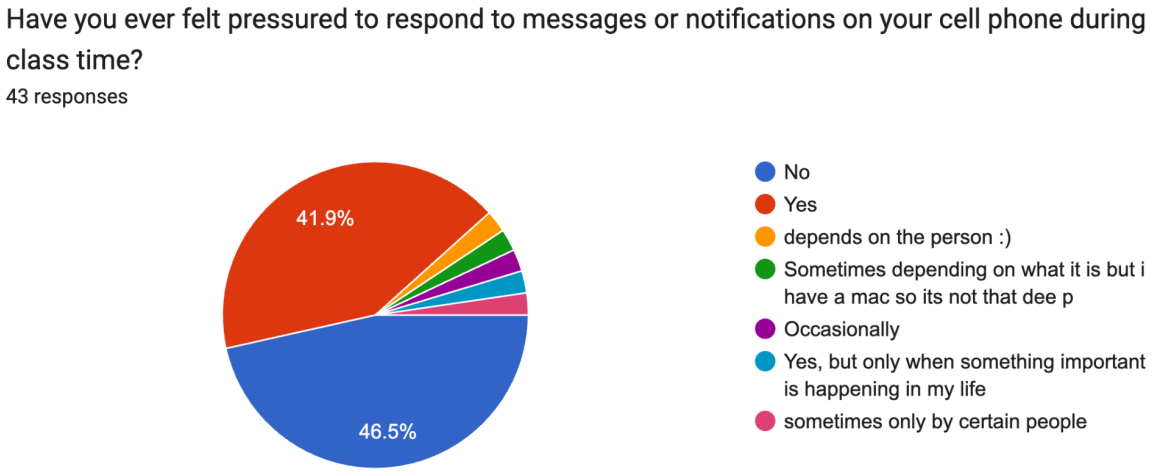
DATA ANALYSIS

The first step in my analysis was to identify the perspectives of students on the cell phone policy. From the 43 respondents in my survey, I was able to generalize the data to the population of all students attending Rouse High School because it satisfies the central limit theorem (n >30). I had a sample size of 43, which satisfies this theorem.

My sample size consisted of 9th, 10th, 11th, and 12th grade students attending Rouse High School.

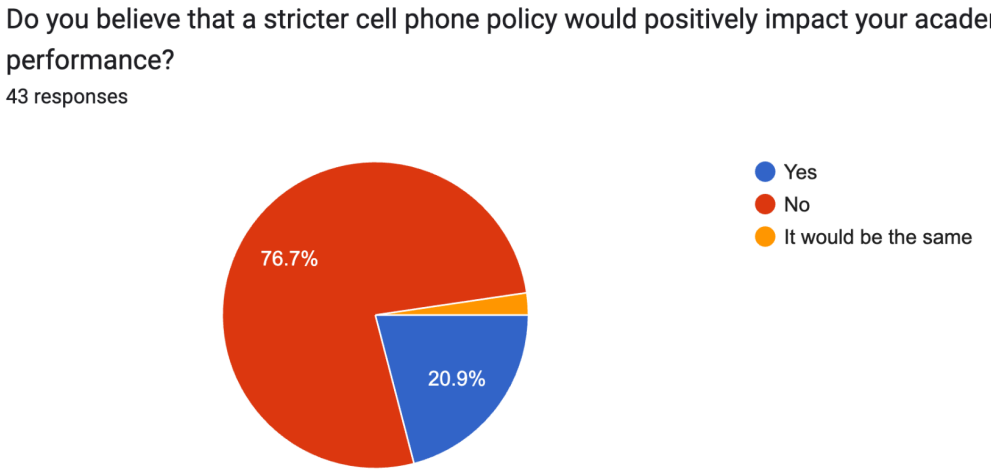


One of the first questions I asked the participants in this survey was have you ever felt pressured to respond to messages or notifications on your cell phone during class time?



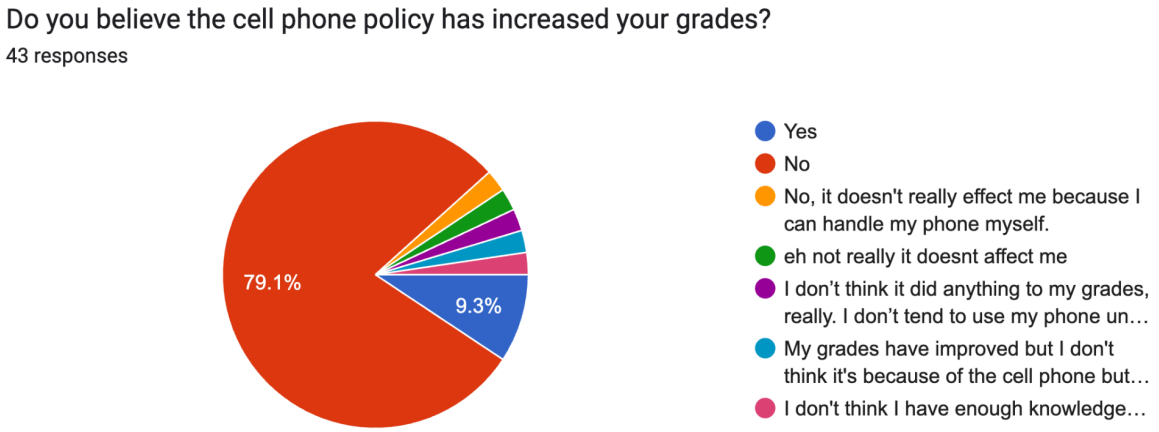
As you can see from the infographic 41.9% of students said yes, and 46.5% of students said no with a cluster of other responses. There was a 6.6% of respondents that did not answer either one of these options but had a different response like “depends on the person” or “occasionally”. Nearly half (41.9%) of the respondents reported feeling pressured to respond to messages or notifications on their cellphones during class time. This indicates that a portion of students at Rouse High School perceive a distraction from their mobile devices during learning hours. On the other hand 46.5% of respondents stated they did not feel pressured to respond to messages or notifications. This suggests that a sizable portion of students are able to manage their digital distractions effectively or do not experience significant pressure to engage with phones during class time.

The next question I asked was do you believe that a stricter cell phone policy would positively impact your academic performance?

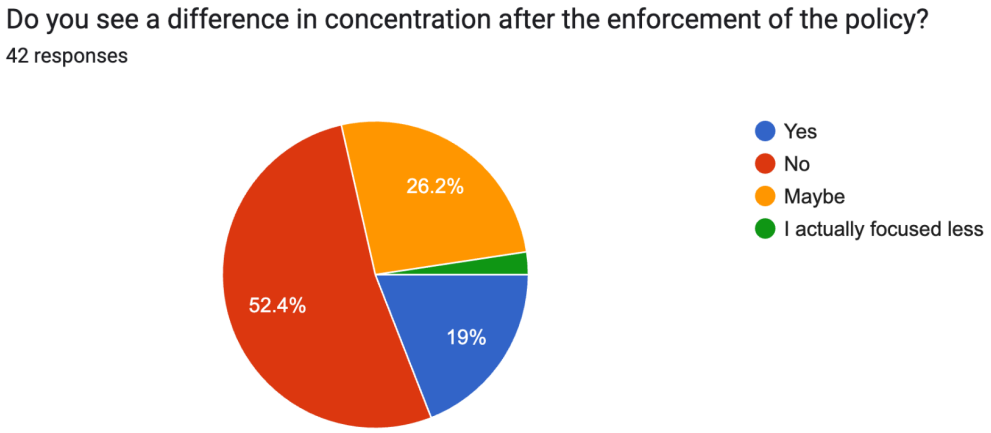


From this graph you can see that 76.7% of 43 respondents said they do not, and 20.9% said they do believe that a stricter cell phone policy would positively impact personal academic performance. There was also a small cohort that said it would be the same. Since the data showed that a significant majority (76.7%) believed that a stricter cell phone policy would not have a positive impact on their academic performance, it indicated that there was a widespread belief among students that reducing cell phone usage would not have an affect on their academic performance. The differing viewpoints might stem from various factors like individual preference, experiences, etc. Students who support stricter policies may value minimizing distractions and promoting focus, while those opposed may prioritize autonomy and access to resources.

I also asked the question of do you believe that the cell phone policy has increased your grades?



79.1% of the respondents say that no it did not, 9.3% said yes it did. The majority of respondents indicated that they do not believe in the power to increase grades and this suggests that most students do not attribute improvements in their academic performance directly to the implementation of cell phone policies. Approximately 9.3% said they do correlate the cell phone policy to increasing grades. This minority viewpoint suggests that some students may perceive a positive correlation between stricter cell phone regulations and academic achievement. They may attribute improvements in their grades due to reduced distractions or increased focus resulting from the policy. This data suggests that while the majority of students do not perceive the cell phone policy as directly influencing their grades, a minority believes in its positive impact.



When asked if there was a visible difference in concentration after the enforcement of the policy, 52.4% said no, 19% said yes, and 26.2% said maybe. The data suggests that while some students perceive a positive impact on concentration following the enforcement of the policy, a significant portion did not observe notable changes.

The next step of my data analysis was to conduct a two sample t-test on independence. I chose this test because I was interested in determining whether there is a statistically significant correlation between the means in two unrelated groups (in this case spanish and math test grades).

Spanish w/cellph	Spanish w/o cells	
93	91	test 1
94	85	test 2
82	90	test 3
91	94	test 4
90	90	avg
TTest		
0.5	- greater than 0.05	
math w/cellphon	math w/o cells	
71	74	test 1
70	76	test 2
74	78	test 3
81	81	test 4
73	79	test 5
75	82	test 6
71	74	test 7
73.57142857	77.71428571	avg
0.02286403112	less than 0.05	

I conducted this test on google spreadsheets as it did it for me. The class averages for the four tests for AP Spanish without the ban placed were - 93%, 94%, 82%, 91% and the average for all four test scores was 90%. For the class without cell phones the averages for the class was 91, 85, 90, 94, and the average for all four test scores was 90%. The class averages for the six tests for AP Statistics without the ban placed were - 71%, 70%, 74%, 81%, 73%, 75% and the average for all six test scores was approximately 73.57%. For the class without cell phones the

average for the class was 74%. 76%, 78%, 81%, 79%, 82% and the average for all six test scores was approximately 77.7%. Once completing this test I found that the p-value for AP Spanish once completing the two sample t-tests was 0.5. This was greater than our alpha of 0.05. Therefore, we failed to reject the null hypothesis which allowed us to come to the conclusion that there was no significant correlation between the cell phone usage policy and academic achievement. For the AP Statistics portion, we got a p-value of 0.022864031112. This p-value was lower than our alpha of 0.05 which allowed us to reject the null hypothesis and come to the conclusion that there was a significant correlation between cell phone use and academic achievement for this course. The new understanding was that there was a correlation between the cell phone policy and academic prowess for AP Statistics classes but not for AP Spanish classes. The study was able to bridge the gap between the pre-existing knowledge of the scientific community as it now has identified a correlation between the variables at the high school level at Rouse High School.

LIMITATIONS

There were a number of limitations that arose throughout the duration of my study. The first notable limitation was that each class consisted of different students that had different starting academic levels which can affect how the students do on their tests, which could potentially skew results. This can also pose various other confounding variables because each student is enrolled in different courses that might affect academic abilities, motivations, and learning styles. Each class period also consisted of a different number of students. Which can also potentially skew results as the capacity for variation increases as the sample size increases.

Another limitation in terms of the survey was that there was non-response bias involved as students had the capacity to not answer truthfully. Since the survey was self-reporting, I did not have confirmation that the data that they were inputting was truthful and accurate. Lastly, the sample size used in my survey was n=43. However, I believe that if my sample size was larger I would have been able to generalize the results to a broader population.

IMPLICATIONS

Along with my study a few implications were also generated. The first implication was that there was the scope to create new policies and place them into effect. Since we now have proof that the cell phone policy was efficient in an AP Statistics classroom, but not in an AP Spanish classroom, the school administration can hold the cell phone ban in math classrooms, and lift the ban in spanish classrooms for example. Additionally, because of this study there is an increase in parental awareness. Since we found that there is a positive aspect to the cell phone policy it confirms stereotypes and states that there are pros to the cell phone policy as it is proven to be effective. Additionally, the study's findings may prompt further research and dialogue between the educational community regarding the role of technology in the classroom. Educators and policymakers may use this evidence to engage in discussions about the development and implementation of effective strategies to manage digital distractions while leveraging the educational potential of mobile devices. Furthermore, the study's results emphasize the importance of ongoing evaluation and adaptation of cell phone policies to ensure their relevance and effectiveness in evolving educational landscapes.

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FUTURE DIRECTIONS

After completing my research project, I had a few inputs for future research studies. In the foreseeable future I want to take a broader approach. Instead of just measuring the correlation of the cell phone policy to academic performance in spanish and math classes I want to look at other courses as well like Science, STEM, History, and more. This way I can get a broader understanding of how the cell phone policy affects grades and the learning environment in various domains.

Additionally in the future I want to have a greater sample size for any surveys done to ensure that I am correctly and accurately representing the population through my generalized data from the sample. I would like to get around 100-150 responses on my survey in comparison to the 43 respondents I had during my survey.

CONCLUSIONS

Rouse high school implemented a cell phone policy during the academic year of 2023-2024 where the use of cell phones was prohibited within the school premises. This policy sparked significant controversy regarding its potential academic benefits for its students. This research paper explained the possible correlation between the cell phone policy and academic performance, as well as the learning environment at Rouse High School. The study seeked to determine the value of such a policy in relation to academic successes of students. A hypothesis was formulated positing that the implementation of the cell phone policy would lead to improved academic performance, to investigate this hypothesis, a mixed methods approach was employed, Initially, a preliminary survey was conducted to gauge the perspective of students regarding the

cell phone policy at Rouse High School. Subsequently, a correlational analysis was conducted to assess the strength and direction of the linear relationship between the policy and academic achievement focusing on specific test averages in math and spanish courses, The analysis revealed a statistically significant relationship between the cell phone policy and academic achievement in math. However, the correlation between the policy and academic performance is deemed insignificant. These findings shed light on the potential impact of the cell phone policy on students' academic prowess at Rouse High School.

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