The Effect of Magnet Program Participation on the Academic Progress of High School Students During Emergency Remote Learning due to Coronavirus SARS-2 (COVID-19)

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The Northwestern Education Association (NWEA) concluded that the academic performance of students declined significantly during emergency remote learning due to school closures in 2020 during the COVID-19 pandemic. (Hoofman & Secord 2021, May 19). The purpose of this study was to determine whether freshmen high school students enrolled in magnet and college preparatory or nonmagnet programs experienced different academic declines. It was hypothesized that the academic decline experienced by magnet students would be less than that experienced by nonmagnet students due to the rigor associated with magnet programs. Freshmen completed an online questionnaire (See Appendix E) about their emergency remote learning experiences. The average score for responses to questions relating to emergency remote learning having a positive effect (M=2.49) was further from the strongly agreed score, 4, than responses for a negative effect (M=2.60). Math and Reading Measures of Academic Progress (MAP) test scores of freshmen in honors and college preparatory courses from Fall 2019 and Fall 2021 were compared to those of freshmen students in magnet programs using a paired t-test. The mean difference between reading scores of magnet and nonmagnet students for 2019 was statistically significant when compared to their mean reading scores in 2021. However, there was no statistically significant difference in math scores. Based on these results, it was concluded that magnet programs did not have a significant impact on the academic decline of high school freshmen. These results mean that declines in academic performance were related to factors other than magnet program participation.

Introduction

COVID-19, a respiratory disease in humans caused by a coronavirus (SARS-2), was initially identified in China in 2019 and has transformed the United States educational system. Many educators believe it will significantly impact students' academic performance for years to come. However, the exact impact of COVID-19's disruption to the educational process is still unknown.

The COVID-19 outbreak was declared a pandemic in March 2020 by the World Health Organization (WHO). As of January 23, 2022, it was responsible for at least 1,265,710 deaths in the United States and at least 15,108 deaths in South Carolina (The New York Times 2022, January 23). Until March 2020, most school-age students participated in some form of in-person learning. Shortly after the pandemic declaration by the WHO, Governor Henry McMaster declared a state of emergency for South Carolina. Many businesses, organizations, and schools were closed to slow the spread of the disease that was causing death among the elderly and those with underlying chronic health conditions. Schools rushed to transition from the traditional in-person learning environment to an emergency remote or virtual learning platform.

Although many students were already using technology in the classroom, many changes had to be made to the curriculum to adapt it to the emergency remote learning platform and the COVID protocols put in place by South Carolina school districts and the South Carolina Department of Education. The hands-on and group work aspects of traditional or in-person education, such as labs, had to be reworked to fit the remote or virtual learning environment. Now that the state of emergency has ended, it has been assumed that the emergency remote learning environment impacted how well students retained information taught during class. Most U.S. students were not accustomed to receiving instruction entirely online or virtually for the entire school day. As Chiu (2021) found, some students struggled to adapt to the new emergency remote learning environment. Also, Zaccoletti et al. (2020) said that students had trouble maintaining academic motivation. Parents, many of whom were required to work remotely from home, were then forced to balance working remotely and helping their children with the numerous technological and academic challenges that came with remote learning.

Various studies have been conducted over the past two years to measure the likely impact of the COVID-19 disruption on student academic achievement. Studies reviewed for this research have observed an overall decline in academic performance. For example, third through eighth graders performed 5-10 percentile points lower in 2021 than 2019 in a study done by Johnson, A., & Kuhfeld, M. (2020). In addition, the 2020 COVID crisis was found to have been the year that students learned less than in a typical school year (Engzell et al., 2021). However, few, if any, studies have measured the difference in academic performance based on the rigor of the educational curriculum (i.e., magnet versus nonmagnet) taught via an online or virtual platform during emergency remote learning.

Generally, the studies that have been conducted to date on the impact of COVID-19 on high school students have focused on the mental or sociological effects of the pandemic on high school students (Hoofman & Secord 2021, May 19). Other studies have examined the effectiveness of online education compared to the traditional school environment, but most of those studies were conducted before the pandemic with mixed results. For example, prior to the pandemic, researchers Ahn and McEachin concluded that online high school performance was lower online than in the brick-and-mortar environment because the students in online classes were low-achieving students (Ahn & McEachin, 2017). In addition, none of the studies conducted to date about student academic decline due to the COVID-19 crisis have compared the academic performance of students enrolled in magnet programs to the academic performance of their peers in nonmagnet courses.

Magnet programs and schools have smaller class sizes, specialized instruction, and are better-equipped classrooms, according to Walden University (2021, March 25). These programs are designed to provide rigor, accelerated learning, and specialized instruction to students interested in science, technology, engineering, and math (STEM) careers or careers in the fine arts. Some magnet programs and schools focus on science, math, writing, and language arts. Students and parents choose their magnet program or school based on the career path and learning environment they feel is most appropriate for the student(s). Some believe that magnet students may perform better because the curriculum is accelerated and may exceed District graduation requirements for math, science, and English subjects.

Students enrolled in magnet programs are perceived to perform better academically than students enrolled in nonmagnet programs. This perception is based, in part, on the rigor of magnet programs. It is a widely held belief that the more rigorous the program, the better the academic

performance of the students. Therefore, it was hypothesized that there would be less decline in the academic performance of students in magnet programs than their nonmagnet counterparts. Magnet schools were found to positively impact student achievement in an experimental study by Ballou (2006). However, it was previously reported in a dissertation by Pylman (2016) that magnet students do not perform differently academically than other students. The difference reflected in that study was that Asian students tested higher and had greater academic expectations than non-magnet students. However, this study was conducted prior to the COVID-19 pandemic.

Changes or declines in academic performance may be attributed to other factors such as the lack of a quiet place to work and study, the lack of internet or computer resources or other internet connectivity or technological issues, as well as the lack of access to tutoring, social isolation or the lack of academic support outside of the classroom. These and other factors may have impacted academic performance. For example, the sudden change in the educational environment impacted the quality of education. Some teachers were not prepared for the rapid switch to online learning. While some teachers used some technology in their classes, many had to adapt quickly to teaching entirely in a virtual platform and had to adjust their lesson plans quickly. Some students did not have access to assignments or instruction when teachers made those things available online (Kuhfeld 2020, October 28). The potential impact of the rapid switch was the subject of comments in the results of one study of e-learning challenges done by Barrot et al. (2021).

Studies by national diagnostic testing organizations such as the NWEA have focused on elementary and middle school students. The NWEA report showed a decline based on the COVID-19 disruption to the educational process (Hoofman & Secord 2021, May 19). A study by Hammerstein et al. (2021) concluded that the math test scores of high school students in Germany increased due to the remote learning environment. The results of this study was an exception. Other studies such as the one conducted by Hammerstein et al. 2021 concluded the effects of remote learning were equivalent to that of a student not receiving any teaching during a typical summer break. Scientific evidence on the impact of COVID-19 on high school student academic performance in the United States is limited. Before COVID-19, high school students were not required to participate in MAP testing. However, MAP testing was required during emergency remote learning based on CARES Act funding. The assessments were conducted to provide some insight into the impact on high school students' learning.

The purpose of this research was to determine whether there was a difference in the academic decline, if any, of ninth-grade students at Spring Valley High School participating in magnet and nonmagnet educational programs. To test this hypothesis, the MAP Math and Reading scores of freshmen students from Fall 2019 were compared to freshmen Fall 2021 MAP test scores for magnet and nonmagnet Spring Valley students. Additionally, freshmen students were asked to complete an online questionnaire to collect information about their emergency remote learning experience. Their survey responses were considered when analyzing the MAP test score data.

METHODS

This study examined the data from NWEA MAP test scores and the responses to a on-line questionnaire about the students' emergency remote learning experience. NWEA MAP test scores from the Fall of 2019-2020 and Fall 2021-2022 school years for 80 currently enrolled ninth-grade students participating in magnet and non-magnet academic programs at Spring Valley High School were obtained. The MAP test scores were separated based on enrollment as a magnet or non-magnet student and the average percentage change of the scores of each group of students from the two school years was compared.

To determine student experiences with emergency remote learning, students were asked to respond to an online questionnaire developed via Google form. Parental consent forms were obtained from all participants. The online questionnaire contained 33 questions about the impact of emergency remote learning on the student's academic performance, the type of electronic devices used for online or remote learning, time spent per day with remote learning, and any problems encountered as well as their opinions about online education versus the classroom learning on their academic performance. Additionally, participants were asked to respond to questions using a 4-point Likert scale ranging from 1 (strongly disagree) to 4 (strongly agree) for assessing their remote learning experience. For questions requiring a yes or no response, "yes" was assigned a value of two, and "no" was assigned a value of one. Data collection was done electronically using a Google spreadsheet linked to the online questionnaire.

The design diagram for the study is shown in Table 1.

RESULTS

Data were analyzed using a paired t-test. Figure 1 compares the average MAP Math and Reading scores for all nonmagnet (CP and honors) freshmen students. Neither math nor reading saw a significant increase. Figure 1 is a graph comparing nonmagnet students' 2019 Math and Reading MAP scores to the 2021 Math and Reading MAP scores. Figure 2 compares average MAP Math and Reading scores for all magnet (CP and honors) freshmen students. Reading scores saw a significant increase, unlike the math scores. Figure 2 is a graph comparing magnet students' 2019 Math and Reading MAP scores to the 2021 math and reading MAP scores.

The data were analyzed using a paired t-test to determine whether there were significant differences between the 2019 and 2021 Reading scores for all students. Table 2 is a chart of the mean math and reading scores for magnet and nonmagnet students from 2019 and 2021. There was no statistically significant difference between the 2019 mean scores (M=225.53) and the 2021 mean scores (M=227.44) for the non-magnet students, as seen in Table 2.

However, the data showed significant differences between the 2019 Reading score and the 2021 Reading score for the magnet students. The students' mean 2019 Reading score (M=228.14) differed significantly from the 2021 Reading score (M=264.08) (Table 2). The results were statistically significant; however, the direction of those differences was opposite to my hypothesis. There was no decline in the test scores of magnet students as I hypothesized.

To examine whether the change in scores would differ between the magnet and the non-magnet students, a change score variable was computed by subtracting the 2021 score from the 2019 score. A negative score would indicate an increase from 2019 to 2021. A positive score would indicate a decrease in scores from 2019 to 2021. The magnet and non-magnet change scores were compared using an independent sample t-test. There were 32 scores in the non-magnet group. There were 48 observations in the magnet group. The differences between the two groups in the change in reading scores were significant. Both groups had a negative change, indicating that the 2021 score was higher than the 2019 score. The nonmagnet group saw a smaller change (M=-1.91) than the magnet group (M=-35.94). The change scores between the two groups were statistically significant as the p-value was less than the alpha value of 0.05 (t=-7.26, p=<.001); however, the change was not consistent with my hypothesis.

The data were also analyzed to determine whether there were significant differences between the 2019 and 2021 Math scores for all students

(i.e., nonmagnet and magnet students combined). Nonmagnet students' mean 2019 Math score (M=230.25) differed from the 2021 Math score (M=234.47). There was no statistically significant difference between means. For magnet students, the 2019 Math scores (M=232.77) were significantly different from the 2021 Math scores (M=241.91). The paired t-test samples revealed a null result. The difference between the two groups on change of math scores was not significant.

However, the nonmagnet group saw an increase in math scores (M=-4.22) lower than the magnet group (M=-9.14). The differences in change scores were not statistically significant as the p-value was greater than 0.05 (t=-.881, p=.381). Magnet students had a greater average percent increase in reading scores (M=9.456) compared to nonmagnet students (M=0.834).Seventeen students responded to the online questionnaire. Of the respondents to the survey, five were male, eleven were female, and one declined to identify gender. All students, except one, were freshmen. Most students (58.8%) responding to the survey were enrolled in magnet programs, as seen in Table 5. (See Tables and Figures). Table 3 is a frequency table illustrating the number of magnet students and nonmagnet students who responded to the questionnaire.

Of the student participants, 64.7% disagreed with the statement that emergency remote learning negatively impacted their academic performance, as seen in Table 4. (See Tables and Figures). Table 4 represents how many and what percentage of respondents strongly agreed, agreed, disagreed, and strongly disagreed with the statement in the table.

Of the respondents, 35.3% indicated their MAP test scores were higher after emergency remote learning (see Table 6 in Tables and Figures) than before compared to 47.1% who indicated their MAP test scores were higher during emergency remote learning than after (see Table 5 in Tables and Figures). Table 5 shows how many and what percentage of respondents strongly agreed, agreed, disagreed, and strongly disagreed with the statement in the table. Table 6 illustrates how many and what percentage of respondents strongly agreed, agreed, disagreed, and strongly disagreed with the statement in the table.

When the scores of magnet students were divided between magnet and nonmagnet students enrolled in honors classes, the results were interesting. Tables 7 and 8 depict a comparison of the mean MAP test scores for students taking nonmagnet honors courses and magnet honors courses. (See Tables and Figures). The findings show that magnet students enrolled in honors classes had a greater increase in their MAP Reading test scores, and nonmagnet had a greater increase in MAP Math test scores. The decline in MAP test scores or least growth occurred among the students enrolled in nonmagnet college preparatory classes. Table 9 compares nonmagnet honors students' 2019 Reading and Math MAP scores to their 2021 Reading and Math MAP scores. Table 10 compares magnet honors students' 2019 Reading and Math MAP scores to their 2021 Reading and Math MAP scores. (See Tables and Figures).

When the Fall 2021 mean MAP test scores of nonmagnet students enrolled in honors courses (M=242.8) from Table 6 were compared to Fall 2021 mean scores of magnet students enrolled in honors classes (M=242.48), see Table 7, the results showed a six-point increase in scores for nonmagnet students enrolled in math honors courses compared to magnet students enrolled in honors math (1.12) in Table 8. Overall, there did not appear to be a significant difference in the math scores between these groups. This was inconsistent with the original hypothesis.

DISCUSSION

The purpose of this study was to determine whether magnet program instruction impacted the academic decline of freshmen high school students compared to other freshmen. The findings of my research did not support my hypothesis that magnet students would experience less of a decline in their MAP test scores due to the learning disruption caused by the COVID-19 pandemic than nonmagnet students. The differences between the change in reading scores were significant. The nonmagnet group saw a smaller increase (M=-1.91) than the magnet group (M=-21.9). The differences in change scores were statistically significant as the p-value was less than the alpha value of 0.05 (t=-7.26, p=<.001). These results were inconsistent with the prediction that magnet students would have a smaller negative change than nonmagnet students. To the contrary, the scores did not decline, and magnet students had a greater positive change.

The difference between the changes of the two groups' math scores was not significant as the p-value was greater than 0.05 (t=-.881, p=.381). The nonmagnet group saw a lower math score change (M=-4.22) than the magnet group (M=-9.14). The differences in change scores were also not statistically significant and were not consistent with my hypothesis. This conclusion appears consistent with the Pylman (2016) study that concluded magnet students do not perform differently academically than other students. The nature of these differences may be explored in future research.

The questionnaire used in this study obtained information from students about their emergency remote learning experiences. More students responded that their scores were higher after remote learning (64.7%) than during (47.1%). This indicated that other factors could have contributed to the changes seen in the data.

There were several other explanations for the findings in this study that should be pursued in future research. Technology issues and internet problems, as Buttler et al. (2021) found, were widespread barriers during emergency remote learning and could have influenced these findings. Outside influences such as distractions at home or internet issues may have contributed to the learning loss experienced by some students. Zaccoletti et. al. (2020) observed that students' academic motivation decreases as students continue going to school over the years, contributing to any significant alterations in MAP test scores. The data revealed that factors such as the rigor of coursework and student motivation play more of a role in academic achievement than magnet program enrollment. Future research should explore whether students in honors or college preparatory classes have a significantly different academic performance after emergency remote learning.

Also, potential sources of error may include, but are not limited to, responses being false and statistical calculation errors. Additional responses to the questionnaire should be collected to ensure statistical significance if this study were to be repeated.

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TABLES AND FIGURES

Table 1 Experimental Design Diagram

Title of the Experiment
The Effect of Magnet Program Participation on the Academic Progress of High School Students During E-Learning due to COVID-19

Hypothesis - Magnet students will have less of an academic decline than nonmagnet students because of the rigorous instruction that magnet students encounter.

Independent Variable - Student Type

Levels of Independent Variable	Non-Magnet students	Magnet students
Number of Repeated Trials	32	48

Dependent Variable - Academic Decline (% change in Math and Reading MAP Scores from Fall 2019 and Fall 2021)

Control Group - N/A (comparative study)

Constants - school, standardized test type, subjects of test scores (math and reading), survey type, survey questions

Table 2 Mean MAP Scores for Magnet and Nonmagnet Students

Program Enrollment Type	Fall 2019		Fall 2021	
	Reading	Math	Reading	Math
Nonmagnet	225.53	230.25	227.44	234.47
Magnet	228.14	232.77	264.08	241.91

Table 3 Magnet Enrollment of Respondents

Magnet Program Enrollment		
	Frequency	Percent
No	7	41.2
Yes	10	58.8
Total	17	100.0

Table 4 Remote Learning Affect Student Perspective

Remote Learning Had Negative Impact on Academic Performance		
	Frequency	Percent
Strongly Disagree	8	47.1
Disagree	3	17.6
Agree	2	11.8
Strongly Agree	4	23.5
Total	17	100.0

Table 5 MAP Test Scores Higher During E-Learning

MAP Test Scores Higher During Remote Learning		
	Frequency	Percent
No	9	52.9
Yes	8	47.1
Total	17	100.0

Table 6 MAP Test Scores Higher After E-Learning

MAP Test Scores Higher After Remote Learning		
	Frequency	Percent
No	11	64.7
Yes	6	35.3
Total	17	100.0

Table 7 Nonmagnet Honors MAP Scores Mean and Comparison

	Fall 2019	Fall 2021	Difference
reading	227.25	233.25	+6
math	236.4375	242.875	+6

Table 8 Magnet Honors MAP Scores Mean and Comparison

	Fall 2019	Fall 2021	Difference
reading	232.2	264.08	+32
math	241.36	242.48	+1.12

Figure 1 Nonmagnet MAP Test Scores

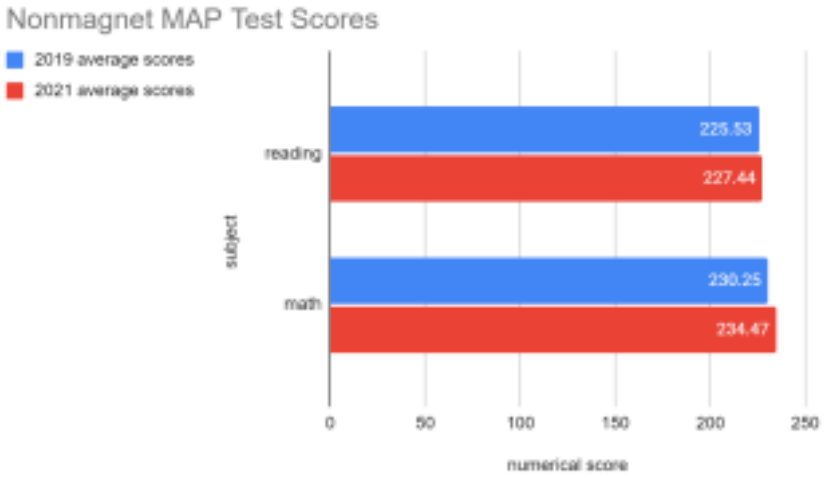
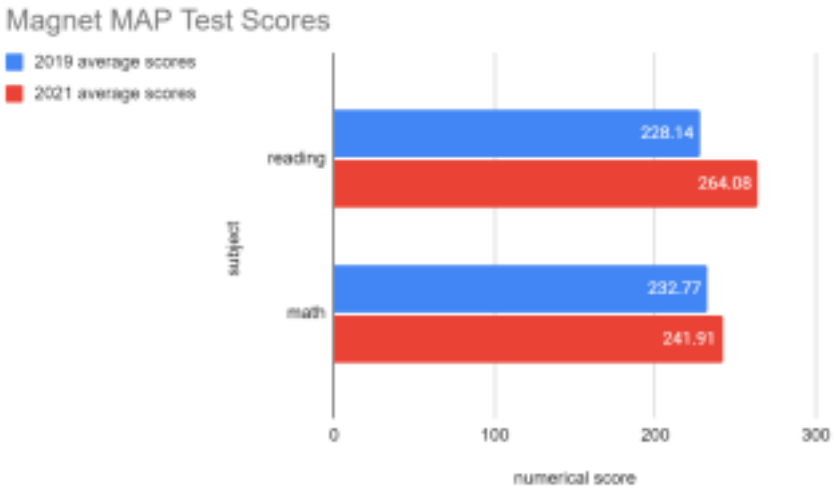


Figure 2 Magnet MAP Test Scores



APPENDIX

Appendix A Nonmagnet 2019 and 2021 MAP Reading Scores

	2019 Reading	2021 Reading	Percent Change
Student 1	222.000	227.000	2.252
Student 2	241.000	255.000	5.809
Student 3	234.000	223.000	-4.701
Student 4	214.000	228.000	6.542
Student 5	229.000	236.000	3.057
Student 6	229.000	239.000	4.367
Student 7	218.000	219.000	0.459
Student 8	222.000	231.000	4.054
Student 9	236.000	246.000	4.237
Student 10	227.000	220.000	-3.084
Student 11	222.000	232.000	4.505
Student 12	224.000	231.000	3.125
Student 13	232.000	242.000	4.310
Student 14	227.000	239.000	5.286
Student 15	226.000	228.000	0.885
Student 16	233.000	236.000	1.288
Student 1	228.000	225.000	-1.316
Student 2	222.000	222.000	0.000
Student 3	224.000	221.000	-1.339
Student 4	225.000	215.000	-4.444
Student 5	226.000	215.000	-4.867
Student 6	215.000	216.000	0.465
Student 7	235.000	237.000	0.851
Student 8	235.000	233.000	-0.851
Student 9	221.000	232.000	4.977
Student 10	221.000	229.000	3.620
Student 11	222.000	221.000	-0.450
Student 12	223.000	221.000	-0.897
Student 13	233.000	232.000	-0.429
Student 14	218.000	197.000	-9.633
Student 15	215.000	212.000	-1.395
Student 16	218.000	218.000	0.000

Appendix B Magnet 2019 and 2021 MAP Reading Scores

	2019 Reading	2021 Reading	Percent Change
Student 1	228.000	251.000	10.088
Student 2	240.000	269.000	12.083
Student 3	237.000	280.000	18.143
Student 4	237.000	260.000	9.705
Student 5	233.000	259.000	11.159
Student 6	240.000	285.000	18.750
Student 7	247.000	277.000	12.146
Student 8	228.000	244.000	7.018
Student 9	226.000	265.000	17.257
Student 10	217.000	255.000	17.512
Student 11	230.000	262.000	13.913
Student 12	239.000	261.000	9.205
Student 13	230.000	260.000	13.043
Student 14	215.000	259.000	20.465
Student 15	231.000	262.000	13.420
Student 16	232.000	263.000	13.362
Student 17	229.000	255.000	11.354
Student 18	245.000	260.000	6.122
Student 19	230.000	255.000	10.870
Student 20	236.000	257.000	8.898
Student 21	218.000	274.000	25.688
Student 22	241.000	301.000	24.896
Student 23	224.000	257.000	14.732
Student 24	241.000	266.000	10.373
Student 25	231.000	265.000	14.719
Student 1	214.000	221.000	3.271
Student 2	228.000	251.000	10.088
Student 3	224.000	232.000	3.571
Student 4	222.000	234.000	5.405
Student 5	230.000	232.000	0.870
Student 6	222.000	240.000	8.108
Student 7	215.000	228.000	6.047
Student 8	237.000	244.000	2.954
Student 9	235.000	240.000	2.128
Student 10	229.000	241.000	5.240
Student 11	222.000	240.000	8.108
Student 12	237.000	240.000	1.266
Student 13	216.000	235.000	8.796
Student 14	225.000	231.000	2.667
Student 15	230.000	232.000	0.870
Student 16	216.000	231.000	6.944
Student 17	227.000	230.000	1.322
Student 18	223.000	236.000	5.830
Student 19	222.000	230.000	3.604
Student 20	221.000	229.000	3.620
Student 21	214.000	240.000	12.150
Student 22	225.000	241.000	7.111
Student 23	220.000	229.000	4.091

Appendix C Nonmagnet 2019 and 2021 MAP Math Scores

	2019 Math	2021 Math	Percent Change
Student 1	242.000	249.000	2.893
Student 2	254.000	268.000	5.512
Student 3	253.000	251.000	-0.791
Student 4	223.000	235.000	5.381
Student 5	244.000	261.000	6.967
Student 6	244.000	245.000	0.410
Student 7	227.000	230.000	1.322
Student 8	244.000	245.000	0.410
Student 9	238.000	240.000	0.840
Student 10	234.000	221.000	-5.556
Student 11	233.000	232.000	-0.429
Student 12	215.000	233.000	8.372
Student 13	235.000	247.000	5.106
Student 14	227.000	238.000	4.846
Student 15	227.000	235.000	3.524
Student 16	243.000	256.000	5.350
Student 1	224.000	219.000	-2.232
Student 2	229.000	237.000	3.493
Student 3	225.000	216.000	-4.000
Student 4	237.000	245.000	3.376
Student 5	219.000	222.000	1.370
Student 6	206.000	206.000	0.000
Student 7	235.000	240.000	2.128
Student 8	225.000	231.000	2.667
Student 9	229.000	240.000	4.803
Student 10	218.000	220.000	0.917
Student 11	218.000	217.000	-0.459
Student 12	248.000	234.000	-5.645
Student 13	226.000	231.000	2.212
Student 14	200.000	205.000	2.500

Appendix D Magnet 2019 and 2021 MAP Math Scores

	2019 Math	2021 Math	Percent Change
Student 1	238.000	233.000	-2.101
Student 2	251.000	248.000	-1.195
Student 3	259.000	252.000	-2.703
Student 4	244.000	242.000	-0.820
Student 5	241.000	246.000	2.075
Student 6	250.000	245.000	-2.000
Student 7	249.000	259.000	4.016
Student 8	232.000	224.000	-3.448
Student 9	241.000	247.000	2.490
Student 10	225.000	232.000	3.111
Student 11	234.000	245.000	4.701
Student 12	246.000	244.000	-0.813
Student 13	229.000	238.000	3.930
Student 14	240.000	238.000	-0.833
Student 15	230.000	237.000	3.043
Student 16	246.000	241.000	-2.033
Student 17	231.000	247.000	6.926
Student 18	247.000	248.000	0.405
Student 19	237.000	235.000	-0.844
Student 20	247.000	238.000	-3.644
Student 21	239.000	242.000	1.255
Student 22	246.000	256.000	4.065
Student 23	238.000	233.000	-2.101
Student 24	248.000	243.000	-2.016
Student 25	246.000	249.000	1.220
Student 1	214.000	221.000	3.271
Student 2	228.000	251.000	10.088
Student 3	224.000	232.000	3.571
Student 4	222.000	234.000	5.405
Student 5	230.000	232.000	0.870
Student 6	222.000	240.000	8.108
Student 7	215.000	228.000	6.047
Student 8	237.000	244.000	2.954
Student 9	235.000	240.000	2.128
Student 10	229.000	241.000	5.240
Student 11	222.000	240.000	8.108
Student 12	237.000	240.000	1.266
Student 13	216.000	235.000	8.796
Student 14	225.000	231.000	2.667
Student 15	230.000	232.000	0.870
Student 16	216.000	231.000	6.944
Student 17	227.000	230.000	1.322
Student 18	223.000	236.000	5.830
Student 19	222.000	230.000	3.604
Student 20	221.000	229.000	3.620
Student 21	214.000	240.000	12.150

Appendix E Online Learning Experience Questionnaire

Online Learning Experience Survey

Please answer all questions truthfully. This form and/or any answers to this form should not be shared with anyone else. This form must be completed by January 6, 2021.

Your email will be recorded when you submit this form

* Required

I am a freshman at Spring Valley High School. *

- ◯ Yes
- ◯ No

Gender *

- ◯ Female
- ◯ Male
- ◯ Prefer not to say

I was completely online for... (Check all that apply) *

- ☐ 1st Quarter 2020-2021
- ☐ 2nd Quarter 2020-2021
- ☐ 3rd Quarter 2020-2021
- ☐ 4th Quarter 2020-2021

Are you in a magnet program? *

- ◯ Yes
- ◯ No

Remote learning negatively affected my academic performance. *

- ◯ Strongly Disagree
- ◯ Disagree
- ◯ Agree
- ◯ Strongly Agree

I thought school was easier in a remote learning environment. *

- ◯ Strongly disagree
- ◯ Disagree
- ◯ Agree
- ◯ Strongly agree

I had to work harder to keep up with my classwork in the remote learning environment than in the traditional classroom. *

- ◯ Strongly Disagree
- ◯ Disagree
- ◯ Agree
- ◯ Strongly Agree

I had to study harder to maintain my grades in the remote learning environment than in the traditional classroom. *

- ◯ Strongly disagree
- ◯ Disagree
- ◯ Agree
- ◯ Strongly agree

Teachers were more understanding about workload and due dates in the remote learning environment than in the traditional classroom. *

- ◯ Strongly disagree
- ◯ Disagree
- ◯ Agree
- ◯ Strongly agree

My grades were higher in the remote learning environment. *

- ◯ Yes
- ◯ No

I was completely online for... (Check all that apply) *

- ☐ 1st Quarter 2020-2021
- ☐ 2nd Quarter 2020-2021
- ☐ 3rd Quarter 2020-2021
- ☐ 4th Quarter 2020-2021

Are you in a magnet program? *

- ◯ Yes
- ◯ No

Remote learning negatively affected my academic performance. *

- ◯ Strongly Disagree
- ◯ Disagree
- ◯ Agree
- ◯ Strongly Agree

My MAP test scores were higher after remote learning began. *

- Yes
- No

I delayed homework or assignments for so long that I was not able to complete them by the established deadline. *

- Strongly disagree
- Disagree
- Agree
- Strongly agree

While learning remotely, I rushed to complete assignments. *

- Strongly disagree
- Disagree
- Agree
- Strongly agree

No one was checking, so I did not care whether I completed my assignments. *

- Strongly Disagree
- Disagree
- Agree
- Strongly Agree

I used online tutoring or other online assistance (such as peer tutoring, group discussions, or peer feedback) during the remote learning. *

- Yes
- No

During the remote learning, I could not concentrate during online learning because I was distracted. *

- Strongly disagree
- Disagree
- Agree
- Strongly agree

I have poor time management skills. *

- Strongly disagree
- Disagree
- Agree
- Strongly agree

I did not prepare for my online classes. *

- Strongly disagree
- Disagree
- Agree
- Strongly agree

One or more of my teachers was not able to use the technology effectively. *

- Strongly Disagree
- Disagree
- Agree
- Strongly Agree

I was not able to use the technology effectively. *

- Strongly Disagree
- Disagree
- Agree
- Strongly Agree

I do not like technology. *

- Strongly disagree
- Disagree
- Agree
- Strongly agree

I do not know how to use my Chromebook or the other classroom applications for my class work. *

- Strongly disagree
- Disagree
- Agree
- Strongly agree

I did not understand the directions or expectations during online classes. *

- Yes
- No

I was reluctant to ask questions during my online courses when I did not understand the material. *

- Strongly disagree
- Disagree
- Agree
- Strongly agree

I do not have Internet connections at home. *

- Strongly Disagree
- Strongly Agree

There were a lot of technical difficulties during my online classes (i.e., wifi issues at school/home; mic/speaker issues). *

- Strongly disagree
- Disagree
- Agree
- Strongly agree

Did you have a quiet place at home to have your classes? *

- Yes
- No

Do you have a home computer? *

- Yes
- No

Are any functions not working on your computer (ex: microphone, camera, volume/speaker)? *

- Yes
- No

Appendix F Nonmagnet Reading Scores Analysis

	2019 Scores	2021 Scores
Mean	225.53125	227.4375
Variance	46.06350806	127.2217742
Observations	32	32
Pearson Correlation	0.6900442828	
Hypothesized Mean Difference	0	
df	31	
t Stat	-1.311189924	
P(T<=t) one-tail	0.09971162066	
t Critical one-tail	1.695518742	
P(T<=t) two-tail	0.1994232413	
t Critical two-tail	2.039513407	