THE IMPACT OF THE HEALTH SCIENCE ACADEMY AT BIG SKY HIGH SCHOOL AFFECT STUDENT ACHIEVEMENT AND PREPAREDNESS FOR COLLEGE

by

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TABLE OF CONTENTS

LIST OF TABLES

LIST OF FIGURES

LIST OF FIGURES - CONTINUED

ABSTRACT

The Health Science Career Academy at Big Sky High School was launched in the fall of 2012 and is currently serving 240 students. At the time of implementation, 50% of Big Sky High School graduates were not pursuing post-secondary education. More than 40% of students at Big Sky High School receive free and reduced lunch benefits meaning they are in an economic situation which commonly leads to low achievement and low post-secondary expectations.

A thematic course of study, focused on health science, small learning community and exposure to industry professions and professionals provides a unique educational model designed to engage students, and provide them with the interpersonal support and academic foundation necessary for achieving professional success.

Federally mandated standardized test scores, ACT scores, survey responses, grade point average, and free and reduced lunch status, of academy students, were compared to a control group, of non-academy students, in an effort to determine whether the Health Science Academy is improving student achievement and preparedness for college.

The Health Science Academy appeared to be serving a population of students with abnormally low risk of academic failure. The impacts on academic achievement was inconclusive but impacts on student attitude appeared to be positive as were impacts on preparedness for college.

INTRODUCTION

In 2012 Big Sky High School in Missoula, MT, introduced a career academy in an effort to reform its educational vision, bolster student achievement, and increase enrollment in postsecondary education. Currently the school is staging to enroll its fourth cohort of students into the program, while additional career academies are being considered for implementation throughout Missoula County Public Schools. Career academies have been a common and successful model for school reform for nearly four decades and the purpose of this research project was to determine whether Big Sky High School's academy was meeting its goal of improving student achievement and increasing enrollment in postsecondary education.

Missoula, MT is located in a small valley in western Montana and is populated by approximately 70,000 people (City-data.com). Many of Missoula's residents were drawn to the area by the beautiful mountain views and the exceptional access to a diversity of outdoor recreational opportunities. Missoula is home to the University of Montana where physical therapy, pharmacology, natural resources and education are a few of the academic programs that draw the highest number of students. Missoula College, also located in Missoula, is a technical school that specializes in business, computing and industrial technology, and health care professions. Missoula's two hospitals, outpatient clinics, medical professional facilities, and nursing homes make health care the largest industry in Missoula.

Big Sky High School is one of three high schools in the Missoula County Public School District. Big Sky High School is comprised of approximately 1,100 students,

40% of whom qualify for free and reduced lunch. The school is a 50/50 mix of urban and rural students and is located on the outskirts of the city. Most of the students at Big Sky High School are Caucasian with the largest minority being American Indian. Within the school there are also small, yet noticeable, populations of Hmong and Belarusian students (J. Courtney, personal communication, April 6, 2015).

Like most high schools across the country, Big Sky High School is based on a model that was put into place decades ago. "American schools resemble and reflect an industrial age heritage that closely resembles an assembly line. This heritage has produced a system trapped by age-old business practices. Currently, schools are caught in a perpetual state of performing to standards with too many standards to implement effectively" (Blomenkamp, 2009, p. 1). As a result, Big Sky High School has been unable to provide many of its students with the skills and knowledge necessary to be successful in the 21st Century. When the planning of the Health Science Academy at Big Sky High School (HSA) began in 2010, approximately 50% of graduates were not moving on to pursue two- and four-year postsecondary educational opportunities (T. Laboski, personal communication, November 11, 2011). This is troubling considering 64% of the occupations projected to grow fastest from 2012 to 2022 will require some form of postsecondary education for entry (Bureau of Labor Statistics, 2013).

This low rate of college attendance can be attributed to poor class attendance, poor academic achievement, a lack of awareness of postsecondary opportunities, and an overall lack of academic engagement due to students' exposure to irrelevant education. The need for reform was not only felt by the students but by the community in general. Career academies such as the HSA are secondary reform models that provide a

foundation for improving student achievement and preparing students for the professions that the community so desperately needs. "Secondary reform has been placed on the forefront of educational agendas as educators, administrators, the business community and politicians seek to rectify alarming dropout rates, and a perceived lack of academic and vocational competence" (Blomenkamp, 2009, p.1).

The HSA was launched in the fall of 2012 in an effort to increase engagement and achievement and ultimately to prepare students for postsecondary education. Health science was chosen as a theme because of the local and national demand for health care professionals. "The academy theme is selected locally based on labor needs and employer interest" (Brand, 2004, p. 5). When the HSA launched there were more than 80 job listings posted by Missoula's two hospitals ranging from computer coder to phlebotomist to registered nurse to physician (T. Laboski, personal communication, November 11, 2011). Furthermore, 14 of the 30 occupations projected to have the largest percentage increase between 2012 and 2022 are related to health care (Bureau of Labor Statistics, 2013).

The HSA has been in place for four years but has yet to undergo any type of formal evaluation. The need for this evaluation is the purpose of this research and has led to the following research question, *How is the Health Science Academy at Big Sky High School impacting student achievement and preparedness for college?* The following sub-questions were addressed:

1. Does the HSA improve student achievement?
2. Does the HSA increase preparedness of college?
3. Does the HSA enhance student development and professionalism?

4. What are the effects of the HSA on subgroups within the HSA?

CONCEPTUAL FRAMEWORK

The current disconnect between K-12 and post-secondary education systems is making the transition from high school to college more challenging. This particularly impacts low-income students and students of color, and it contributes to inadequate preparation for college, higher rates of remediation, and low college completion rates (Venezia, Kirst & Antonio, 2003). In other words, there are fundamental aspects of U.S. high schools that need to be changed in order for students to graduate with the skills necessary to succeed in college. According to the Nation Research Council of the National Academy of Science (2004), "The fundamental challenge is to create a set of circumstances in which students take pleasure in learning and come to believe that the information and skills they are being asked to learn are important and meaningful" (p.14).

Several organizations have formed to initiate reform of the U.S. secondary education system and provide schools with the resources, training, and support to carry out reform efforts. Among the many programs, initiatives, and strategies created by these organizations is the *career academy*. The first career academies were implemented to provide vocational education to students, from low-income families, who traditionally did not pursue post-secondary educational opportunities. The career academy has become one of the most widely used reform models to reduce dropout rates and increase college readiness, and a growing body of research suggests they are effective (Brand, 2004).

The first career academy was established in 1969. The prevalence of career academies grew over the next two decades and became most common in low-income

urban schools. Today, as the high school reform movement continues to accelerate, there are more than 7,000 career academies in the United States (Stern, Dayton & Raby, 2010). The first career academies were implemented to provide vocational education to students, from low-income families, who traditionally did not pursue post-secondary educational opportunities. The primary goals of early career academies were to increase graduation rates and provide high-risk students with the training and education necessary for them to be job-ready upon graduation (Kemple & Snipes, 2000).

The focus of career academies began to shift in the mid-1980s. Instead of focusing purely on vocational preparation, career academies began preparing students for work and college (Kemple & Snipes, 2000). "College and career readiness" is commonly used to discuss the purpose of career academies. As career academies continued to evolve through the 1990s, they began to serve a greater diversity of students who more closely resembled the cross-section of a school's student body. The original goals of increasing student engagement, attendance and achievement, and reducing the dropout and late graduation rates remained paramount (Kemple & Snipes, 2000).

Small learning communities, career-related themes, and community partnerships have been identified as essential to the effectiveness of all career academies. These three components can be used to define a career academy as a small learning community that combines a college-preparatory curriculum with a career theme while fostering partnerships with employers and postsecondary educational institutions (Stern et al., 2010). Career academies are considered small learning communities because students choose to become part of a group of students who take most of their courses together, thus they are continuously working with a sub-group of their class. For example,

freshmen enrolled in the Health Science Academy (HSA) take freshmen science, English, math, geography, health enhancement, and principles in biomedical science only with students who are also enrolled in the academy (T. Laboski, personal communication, November 11, 2011). Furthermore, career academies fit the small learning community model because all academy students have the same teachers, and it is not uncommon for those teachers to advance with the students from year to year. The primary goal of a small learning community is to help students feel safer and more comfortable at school by creating more positive interpersonal support (Kemple & Snipes, 2000).

Effective career academies also combine a college-preparatory curriculum with a career theme. Common examples of career themes are health care, business and finance, engineering, communications media and transportation (Stern et al., 2010). Most students who enroll in a career academy are interested in pursuing a career related to the theme of the academy, but the primary function of the career theme is to provide a topic that unifies the students, teachers, and curricula of different disciplines. The resulting thematic interdisciplinary activities, along with related field trips and career explorations, increase student engagement (Kemple & Snipes, 2000).

The third essential element of effective career academies is partnerships with employers and postsecondary educational institutions. The foundation of this component is a career academy advisory board for every career academy. The advisory board is comprised of local professionals and educators who help the academy staff create a quality curriculum and identify professional skills that are desirable in their respective fields. Advisory board members frequently volunteer as guest speakers, host field trips, and accommodate job-shadowing opportunities. These partnerships are essential to the

success of career academies because they give students the opportunities to explore career options and understand the relevance of curriculum, hence student engagement is increased (Kemple & Snipes, 2000).

A growing body of evidence supports the effectiveness of career academies in increasing student engagement, attendance and achievement, and reducing the rate of dropout and late graduation. According to Stern et al. (2010), students enrolled in career academies had a higher graduation rate, a lower dropout rate, and better attendance than comparative control groups. Career academy participants also had higher grades and earned a larger number of course credits than non-academy students. Finally, Stern found career academy students were more likely to have positive developmental experiences and participated in more extracurricular activities and volunteer projects.

Kemple and Snipes (2000) add to the list of benefits by reporting that the small learning community inherent to the career academy approach enhance the degree of interpersonal support students received. They also found career academy students received more exposure to career awareness and work-based learning experiences by participating in career-related activities such as field trips and job shadows. Perhaps Kemple and Snipes' most significant finding was that students classified as high-risk or low-income experienced the most substantial benefits from career academies. "By bridging school and the world of work, career academies have been successful in engaging many students who would otherwise be indifferent to or possibly lost from school" (Brand, 2004, p.6).

METHODOLOGY

In an effort to increase student engagement, academic performance, and enrollment in post-secondary educational opportunities a career academy was created at Big Sky High School. The Health Science Academy (HSA) enrolled its first class in the fall of 2012, and at the time of this study served 240 students enrolled across all four high school grade levels. The implementation of the HSA was considered the treatment of this study, and the 240 students enrolled in the HSA comprised the treatment group. The research methodology for this project received an exemption by Montana State University's Institutional Review Board and compliance for working with human subjects was maintained (Appendix A).

Academy courses were taught by staff who were selected as HSA teachers. Teacher participation was voluntary and selections were made based on information presented on applications and during interviews. The teachers in the HSA did not loop with cohorts of students and instead remained at a specific grade level course. While looping with a cohort has its advantages, the teachers in the HSA thought they could have the greatest impact by continuing the development of curriculum specific to one grade level.

Freshmen in the HSA took English, math, integrated earth space and physical science, health enhancement, world geography, and principles of biomedical science with only HSA students. Sophomore course scheduling was similar in that students took English 2, math, biology, health enhancement and human body systems within the academy. These five sophomore level courses were also taught by selected HSA teachers. Career academies are considered small learning communities because of this

scheduling strategy, which is intended to facilitate the development of stronger interpersonal relationships. This scheduling strategy also gives teachers better opportunities to integrate their curricula, plan activities related to health science, and collectively monitor the progress of students.

During freshmen and sophomore years, students participated in at least one health science-related field trip per quarter. The intent of these field trips was to increase engagement, add relevance to classroom content, introduce students to a variety of post-secondary educational opportunities, and familiarize students with health science professions. Wrap-around conferences are another unique component of the HSA. During wrap-around conferences parents, teachers, and counselors of students who were having behavioral, academic, or emotional struggles met with the student and developed an intervention plan.

Juniors and seniors were given more independence and freedom in their course schedule. Juniors took medical interventions and seniors took biomedical innovations with other academy students and academy teachers. Juniors were provided two job-shadow opportunities that aligned with their interests while seniors were given the opportunity to obtain an industry certification before graduation. These opportunities were designed to increase engagement and give students a more detailed look at the personal and professional requirements of health science professions. Juniors and seniors also served as leaders of the HSA Ambassador Committee that was responsible for planning social events, community outreach efforts, and communicating the benefits of the academy to the community.

The HSA was designed to accommodate learners from diverse levels and backgrounds who were capable of taking basic core academic courses. The percentage of HSA versus non-HSA students who receive free and reduced lunch benefits were compared to determine whether the HAS served students from low-income families. As part of the National School Lunch Program, students whose families earn up to 130% of the poverty level are eligible for free lunch benefits, and students whose families earn up to 185% of the poverty level are eligible for reduced lunch prices (USDA Food and Nutrition Service, 2013). In this study students whose families earned up to 185% of the poverty level were consider low income, while student from families earning over 185% of the poverty level were not consider low income.

Data were collected using the American College Testing College Readiness Assessment (ACT) and the Montana Comprehensive Assessment System's Criterion Reference Test (CRT). The ACT is a standards-based assessment of students' readiness for college. The ACT is comprised of English, mathematics, reading, science and writing components (The ACT, 2015). In 2014, all Montana high school juniors were eligible to take the ACT at no cost as part of Montana's GEAR UP grant. In 2011 the U.S. Department of Education awarded the state of Montana the GEAR UP grant which covers ACT costs for all Montana public high school juniors, for seven years (Montana Office of Public Instruction, 2014). The CRT is the state of Montana's federally mandated test given to students in grades three to eight and ten. The test differs at each grade level to match appropriate content knowledge. This test assesses students' level of mastery in the subject areas of science, math, and reading. Scores for each subject area

are used to categorize students as *advanced, proficient, nearing proficiency* or *novice* (Measured Progress, 2009-10).

In order to determine whether the HSA was improving academic achievement CRT scores, ACT scores and student grade point averages were collected for HSA students and a set of randomly selected non-HSA students. Students enrolled in special needs or special education courses were eliminated from the non-HSA group because there were no seniors that met those criteria in the HSA. A two sample t-test, with an alpha value of 0.05, was used to compare the grade point averages, CRT scores of HSA and non-HSA students.

The effectiveness of the HSA in preparing students for college was evaluated by comparing HSA seniors' ACT scores, total number of credits earned, and responses to the 12th Grade Student Expectations Survey to a group of randomly selected non-HSA seniors (Appendix B). Students enrolled in special needs or special education courses were eliminated from the non-HSA group because there were no seniors that met those criteria in the HSA. The total number of credits earned and ACT scores of the two groups were compared using a two sample t-test with an alpha value of 0.05. The 12th Grade Student Expectations Survey was analyzed by comparing response percentages of HSA versus non-HSA students.

The CRT assesses students' literacy skills in reading, math, and science. After a student completes each component of the test (reading, math or science) they are given a score that falls into one of the four performance categories. The percentages of HSA versus non-HSA students who were classified as *advanced, proficient, nearing proficiency*, and *novice* learners based on their eighth grade CRT scores were compared

to determine if the academy was serving students from a diversity of achievement levels. The eighth grade CRT scores of HSA and non-HSA students were compared using a two sample t-test in order to gauge the level of academic achievement of the two groups upon entering high school.

ACT and tenth grade CRT scores were used to determine whether the HSA was enhancing the academic performance of students at different levels of academic achievement as categorized by eight grade CRT scores. Tenth science CRT scores of HSA versus non-HSA juniors and seniors who were classified as *advanced* or *proficient* were compared using a two sample t-test. A Wilcoxon Rank Sum test was used to compare tenth grade science CRT and ACT scores of HSA and non-HSA students who were classified as below *proficient* on the eighth grade science CRT. Students were categorized as either *proficient* or *below proficient* for the reading, math and science components of the eighth grade CRT. The ACT scores of HSA versus non-HSA seniors considered *proficient* or *below proficient* for each eighth grade CRT component, were compared using a two sample t-test. Similarly, tenth grade CRT scores of HSA versus non-HSA juniors and seniors considered *proficient* or *below proficient* for each 8^{th} grade CRT component, were compared using a two sample t-test.

HSA students' attitudes about school and the HSA were measured using the HSA Student Voice Survey (Appendix C). The HSA Student Voice Survey was adapted from the Quaglia Institute for Student Aspirations' My Voice survey. The My Voice survey was designed to measure eight conditions across the school. Those conditions include students' sense of belonging, perceived level of interpersonal support, sense of accomplishment, level of enjoyment, sense of curiosity and creativity, spirit of adventure,

level of leadership and responsibility, and confidence to take action (Quaglia Institute for Student Aspirations, n.d). The HSA Student Voice survey is a Likert-style questionnaire designed to measure the same eight conditions, but was created to measure those conditions specifically in the HSA. All HSA students took the survey electronically using Google Forms. Students responded whether they *strongly agree, agree, don't know, disagree,* or *strongly disagree* with each item on the survey. Each item was classified as a reflection of one of the eight conditions and the percentage of responses for each item were represented with a stacked bar graph, along with the other items relating to that condition. The responses to the group of items related to each condition were then analyzed for trends.

The HSA Student Interview was a face-to-face interview with individual students from the academy (Appendix D). During the interviews students were asked nine questions that were designed to measure their attitudes about the HSA. The interviewer recorded the students' responses so students could speak freely and candidly about their perception of the HSA. This information was analyzed by looking for patterns and trends and was used to support the findings from the HSA Student Voice Survey (Table 1).

Table 1
Data Triangulation MatriX

Sub-question	Data Source 1	Data Source 2	Data Source 3
Does the HSA improve student academic achievement?	HSA vs. non-HSA 10th grade CRT scores	HSA vs. non-HSA ACT scores	HSA vs. non-HSA grade point average
Does the HSA increase preparedness of college?	Number of credits earned by HSA vs non-HSA students in the 12th grade	HSA vs. non-HSA ACT scores	12th Grade Student Expectations survey
What sub-groups receive the most benefits from the HSA?	Percentage of HSA vs. non-HSA students who receive free and reduced lunch benefits	Percentage of HSA vs. non-HSA students who are categorized as *advance, proficient, nearing proficiency* and *novice* based on 8th grade CRT scores	A comparison of the ACT and CRT scores of students categorized as *advance* or *proficient* and below *proficient* based on 8th CRT scores HSA vs. non-HSA, and of free and reduced lunch recipients in the HSA vs. non-HSA.
What are students' attitudes about school and the HSA?	HSA Student Voice, Likert-style survey to measure the level of student satisfaction with the HSA.	Student interviews.	

Note. HSA is an abbreviation of Health Science Academy. CRT is an abbreviation of the Montana Comprehensive Assessment System Criterion Reference Test. ACT is an abbreviation of the American College Testing College Readiness Assessment.

DATA AND ANALYSIS

The eighth grade science Montana Comprehensive Systems Criterion Reference Test (CRT) of ninth grade Health Science Academy (HSA) and non-HSA students were compared using a two sample t-test. Health Science Academy ninth grade student scored significantly higher than non-HSA ninth grade students, p=0.02. The same comparison was done for 10th grade students. Similarly, tenth grade HSA students scored

significantly higher on the eighth grade science CRT than non-HSA students, *p*=0.002 (Figure 1).

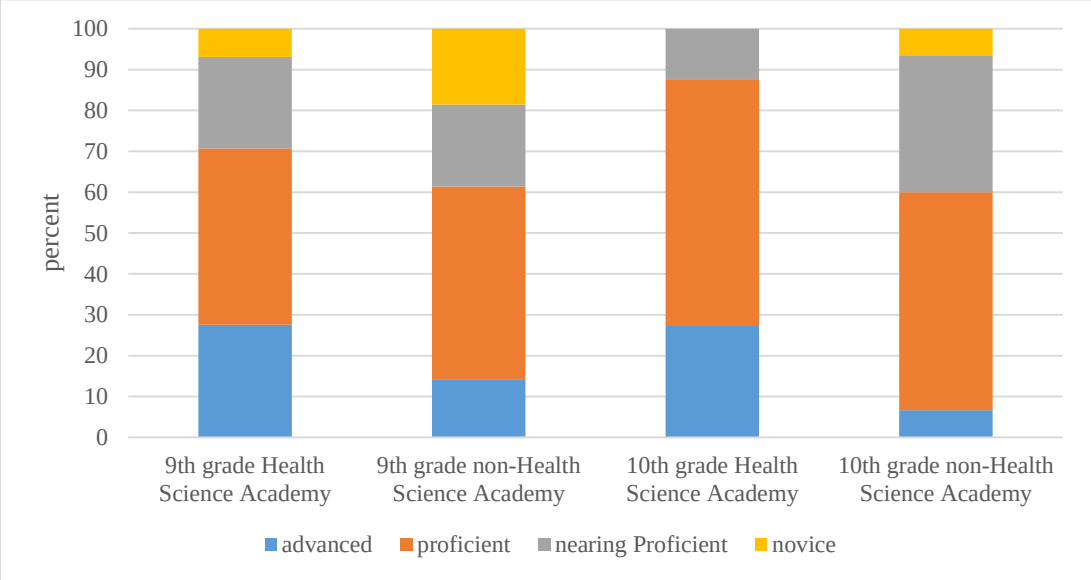

Figure 1. Percent of ninth and tenth grade Health Science Academy students (ninth grade HSA *N*=58, tenth grade HSA *N*=40) and non-Health Science Academy students (ninth grade no-HSA *N*=70, tenth grade non-HSA *N*=45) classified as *advance, proficient, nearing proficient* and *novice* on the eighth grade science CRT.

A two sample t-test comparing reading scores, from the eighth grade CRT, showed a significant difference between 11th grade HSA students and non-HSA students, *p*=0.0004. Seventy-seven percent of non-HSA students were rated as *advanced* or *proficient* readers in eighth grade compared to 91.3% of HSA students. There was also a significant different between HSA students' eighth grade math CRT scores when compared to non-HSA students, *p*=0.002. Fifty percent of non-HSA students were classified as *advanced* or *proficient*, based on eighth grade math CRT scores, compared to 78.2 % of HSA students. Health Science Academy students also scored significantly higher, on the eighth grade science CRT, than non-HSA students, *p*=0.00001. Over 82%

of HSA students were classified as *advanced* or *proficient* on the eighth grade science CRT compared to 55.8% of non-HSA students (Figure 2).

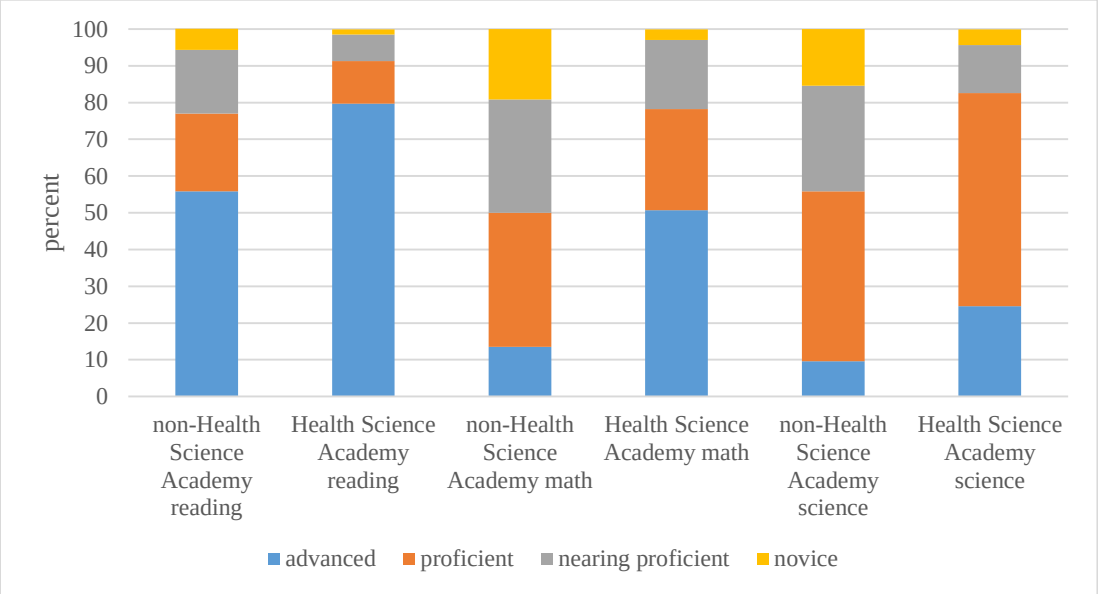

Figure 2. Percent of 11th grade Health Science Academy students (*N*=69) and non-Health Science Academy Students (*N*=52) classified as *advanced, proficient, nearing proficient* and *novice* on the eighth grade CRT.

The results of a two sample t-test, on tenth grade science CRT scores of HSA and non-HSA students who were classified as *advanced* or *proficient* on their eighth grade science CRT, indicated that 11th grade HSA students' scores were significantly higher than non-HSA students, p=0.00002. There was also a significant difference in those two groups' scores on the eighth grade science CRT with HSA students scoring significantly higher, p=0.04 (Figure 3).

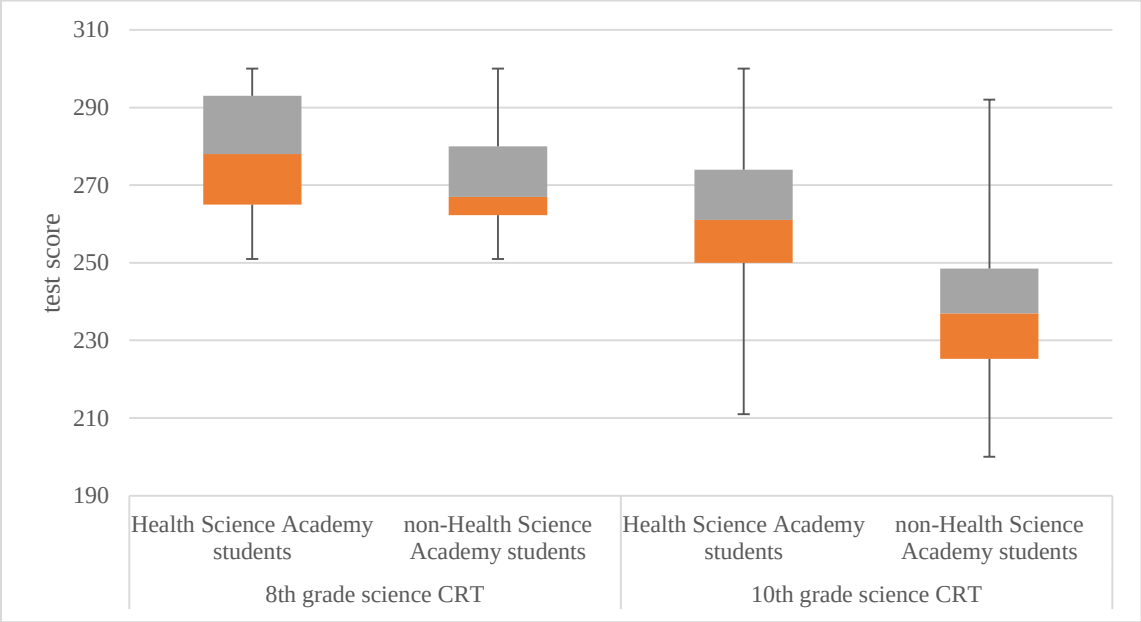

Figure 3. Eighth and tenth grade science CRT scores of 11th grade Health Science Academy student (*N*=57) and non-Health Science Academy students (*N*=28) who were classified as *advance* and *proficient* on the eighth grade science CRT.

The eighth and tenth grade science CRT scores of 11th grade HSA and non-HSA students, who received free and reduced lunch benefits, were compared using a two sample t-test. There was not a significant difference between the eighth grade science CRT scores of HSA students and non-HSA students, p=0.06. Health Science Academy students who received free and reduced lunch benefits had a higher mean tenth grade science CRT score, than non-HSA students but again, the difference was not significantly higher, p=0.35 (Figure 4).

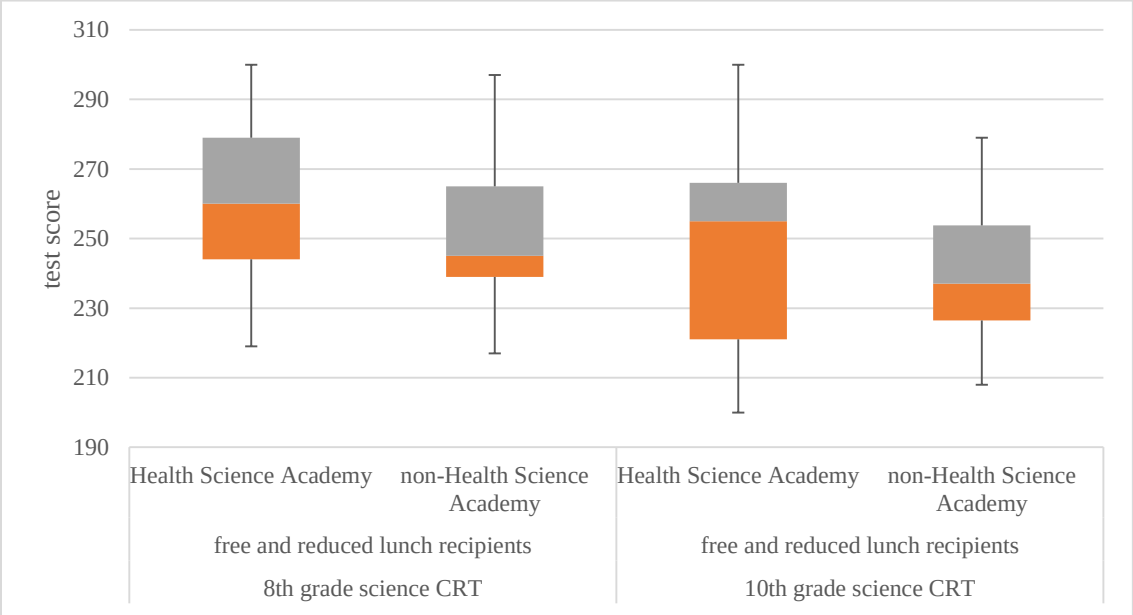

Figure 4. Eighth and tenth grade science CRT scores of 11th grade HSA and non-HSA students who receive free and reduced lunch benefit.

A two sample t-test was used to compare the eighth grade reading CRT scores of 12th grade HSA and non-HSA students. Twelfth graders in the HSA had significantly higher eighth grade reading CRT scores than non-HSA students, p=0.003. Health Science Academy students also scored significantly higher on the eighth grade math CRT, p=0.001. A similar trend was observed on the eighth grade science CRT with HSA students scoring significantly higher than non-HSA students, p=0.004, (Figure 5).

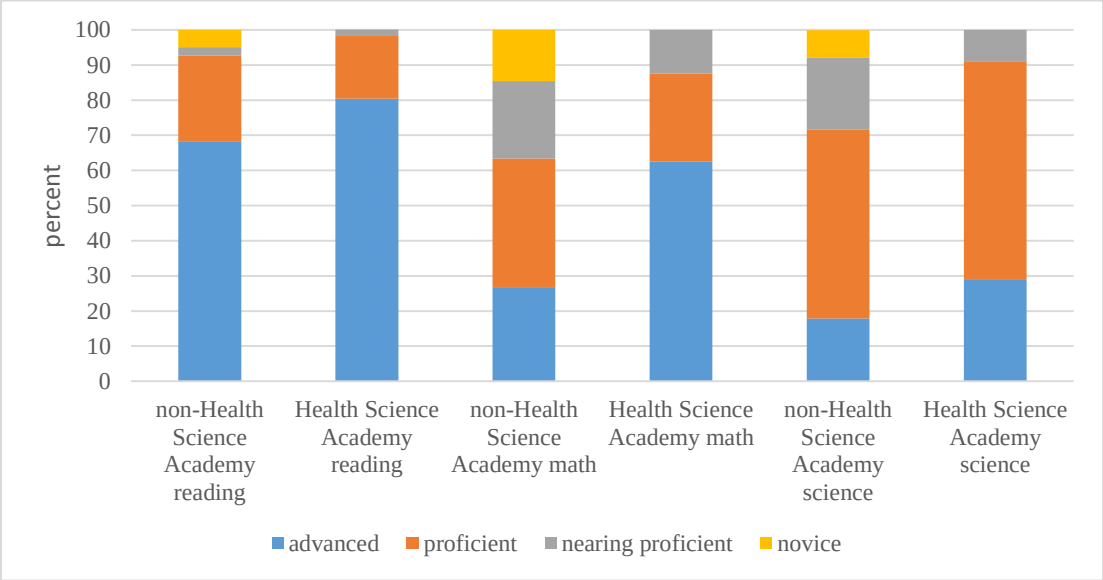

Figure 5. Percent of 12th grade Health Science Academy students (*N*=56) and non-Health Science Academy Students (*N*=41) classified as *advanced*, *proficient*, *nearing proficient* and *novice* on the eighth grade CRT.

The results of a two sample t-test, on the tenth grade science CRT scores of 12th grade HSA and non-HSA students who were classified as *advanced* or *proficient* on the eighth grade science CRT, showed no significant difference between their eighth grade scores, p=0.34. Health Science Academy students had a higher mean score on the 10th grade science CRT than non-HSA students, but the difference was not significant, p=0.19 (Figure 6).

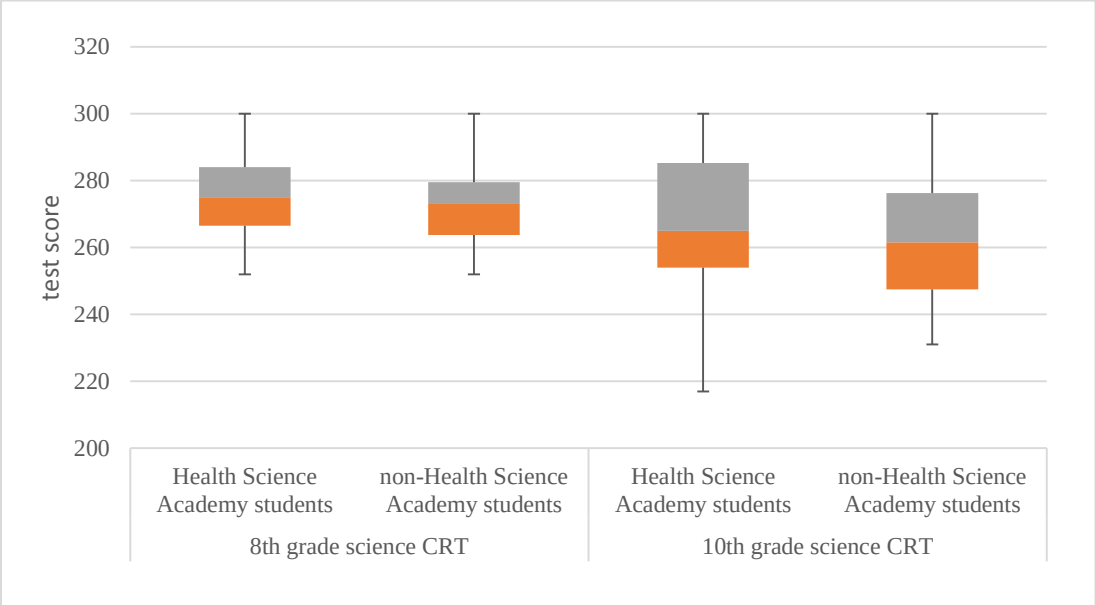

Figure 6. Eighth and tenth grade science CRT scores of 12th grade Health Science Academy student (*N*=50) and non-Health Science Academy students (*N*=26) who were classified as *advanced* or *proficient* on the eighth grade science CRT.

The results of a two sample t-test showed no significant difference in the composite ACT scores of HSA students and non-HSA students who were classified as *advanced* or *proficient* on the eighth grade math CRT, though HSA students had a higher mean score, *p*=0.39. Analysis also indicated was no significant difference between the eighth grade math CRT scores of HSA students compared to non-HSA students, *p*=1.60 (Figure 7).

A Wilcoxon Rank Sum Test was used to compare the composite ACT scores of HSA and non-HSA students who were classified as below *proficient* on the eighth grade math CRT. The results were similar to the comparison of the *advance* or *proficient* groups in that there was no significant difference between HSA and non-HSA students on both the eighth grade math CRT, *p*=0.26, and the ACT, *p*=0.08, (Figure 7).

Figure 7. Composite ACT scores of 12th grade HSA student who were classified as *advance* or *proficient* (*N*=49) and below *proficient* (*N*=7) on the eighth grade math CRT compared to non-HSA students who were *advanced* or *proficient* (*N*=26) and below *proficient* (*N*=7).

The composite ACT scores of 12th grade HSA students and non-HSA students who were classified as *advanced* or *proficient* on the eighth grade science CRT were compared using a two sample t-test. Health Science Academy students had a higher mean score on the eighth grade science CRT than non-HSA students but the difference was not significant, p=0.19. Similarly, the HSA students had a higher mean composite ACT score than the non-HSA group, but the difference was not statistically significant, p=0.40 (Figure 8).

A Wilcoxon Rank Sum Test was used to compare the composite ACT scores of 12th grade HSA and non-HSA students who were classified as below *proficient* on the eighth grade science CRT. There was not a significant difference in the eighth grade science CRT scores of HSA student compared to non-HSA students, p=0.11. There was also no significant difference between the composite ACT scores between these two groups, p=0.06 (Figure 10).

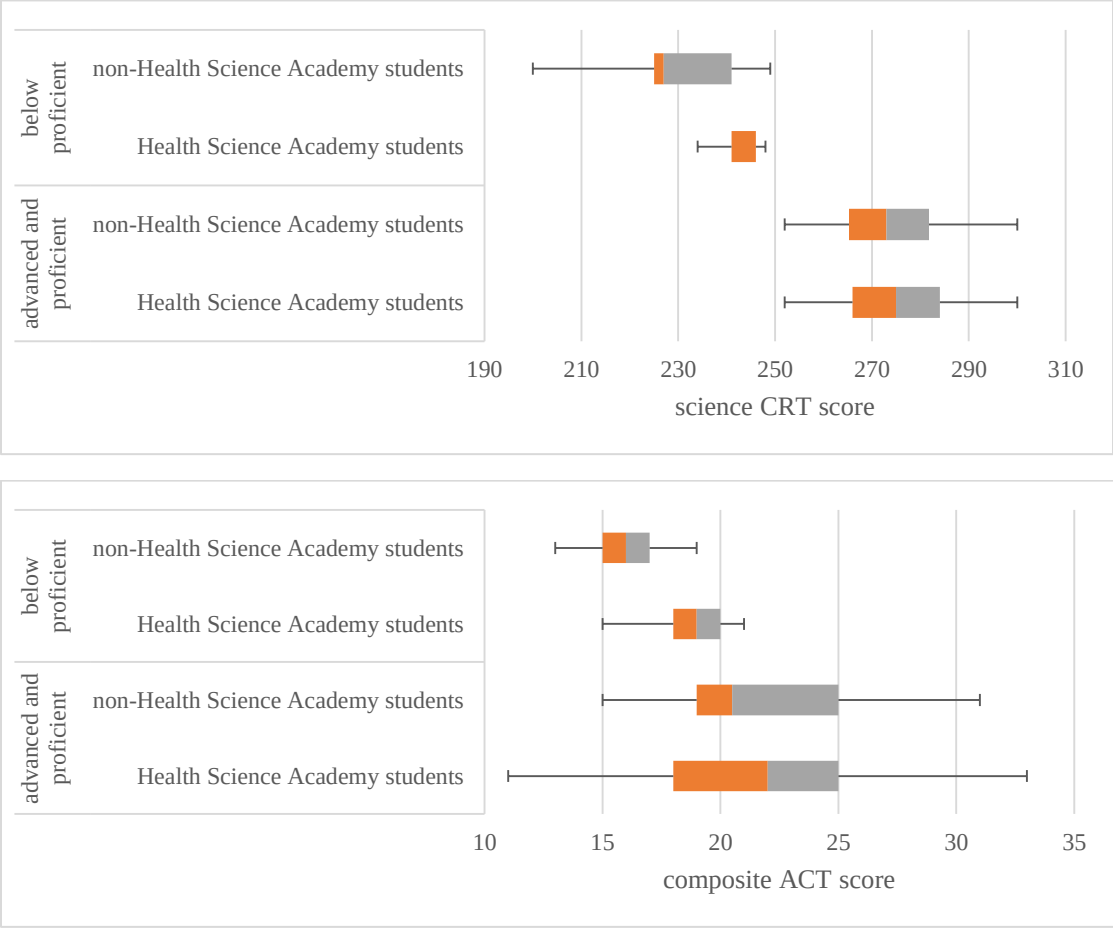

Figure 8. Composite ACT scores of 12th grade HSA student who were classified as *advance* or *proficient* (N=50) and below *proficient* (N=5) on the eighth grade science CRT compared to non-HSA students who were *advanced* or *proficient* (N=24) and below *proficient* (N=5).

The percentage of HSA students receiving free and reduced lunch benefits was compared to that of a randomly selected group of non-HSA students across all four high school grade levels. There are fewer HSA students receiving free and reduced lunch benefits in all four grade levels. Thirty percent of all HSA students received free and reduced lunch benefits compared to 40.1% of non-HSA students (Figure 9).

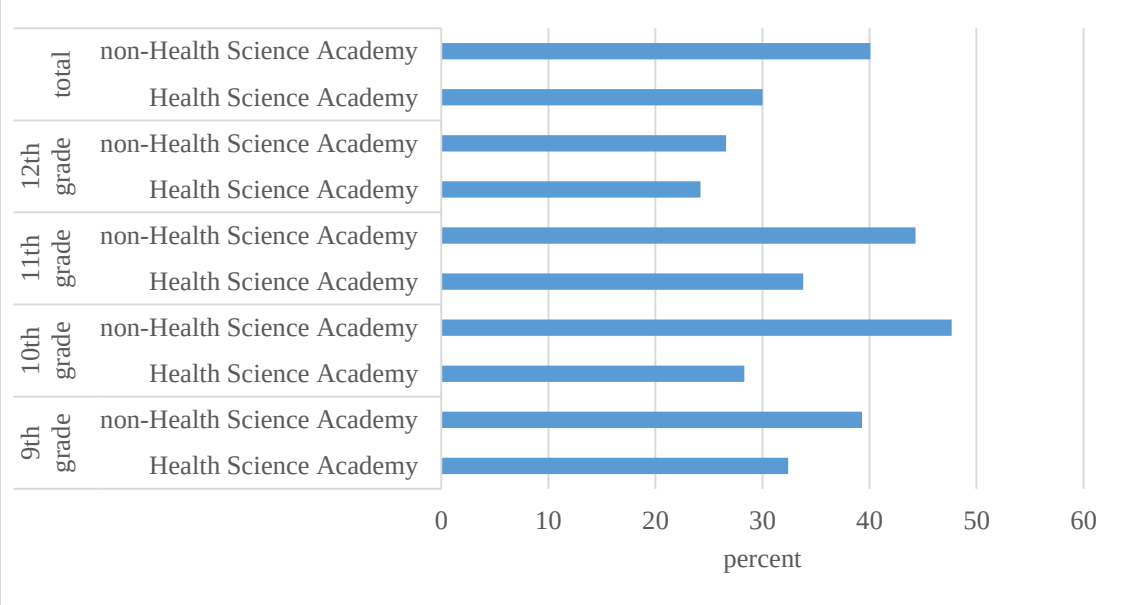

Figure 9. Percent of HSA students (N=270) and non-HSA students (*N*=289) receiving free and reduced lunch benefits.

A two sample t-test was also used to compare the eighth and tenth grade science CRT scores of 12th grade HSA and non-HSA students who received free and reduced lunch benefits. Twelfth grade HSA students scored significantly higher on the eighth grade science CRT, $t(22)=2.38$, $p=0.003$, and the tenth grade science CRT, $p=0.003$, (Figure 10).

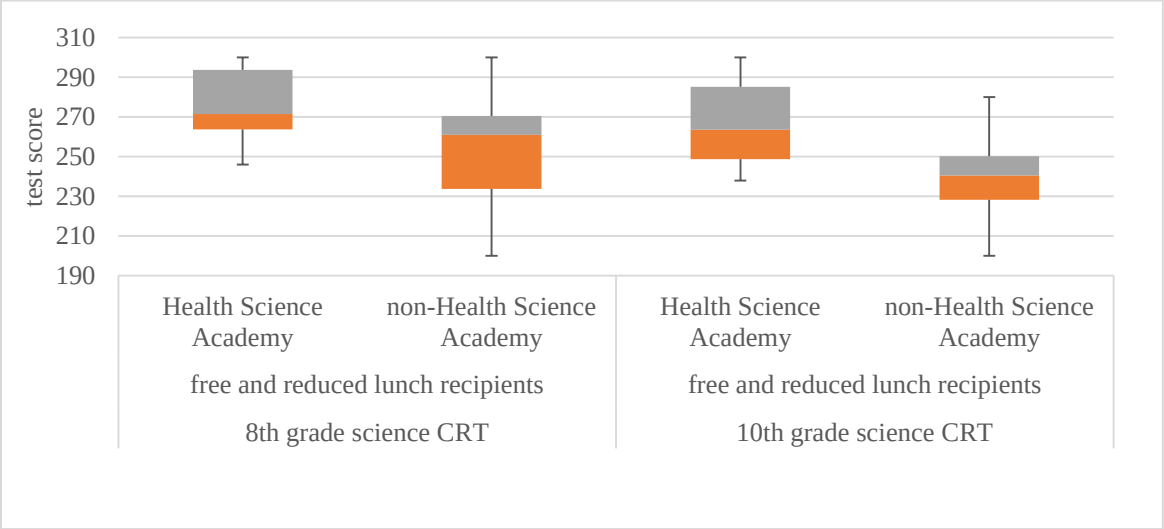

Figure 10. Eighth and tenth grade science CRT scores of 12th grade HSA and non-HSA students who receive free and reduced lunch benefits.

A two sample t-test revealed that HSA students who received free and reduced lunch benefits had significantly higher composite ACT scores than non-HSA students, p=0.002. Twelfth graders in the HSA who did not received free and reduced lunch benefits had a higher mean ACT score than non-HSA students, but the difference was not significant, p=0.41 (Figure 11).

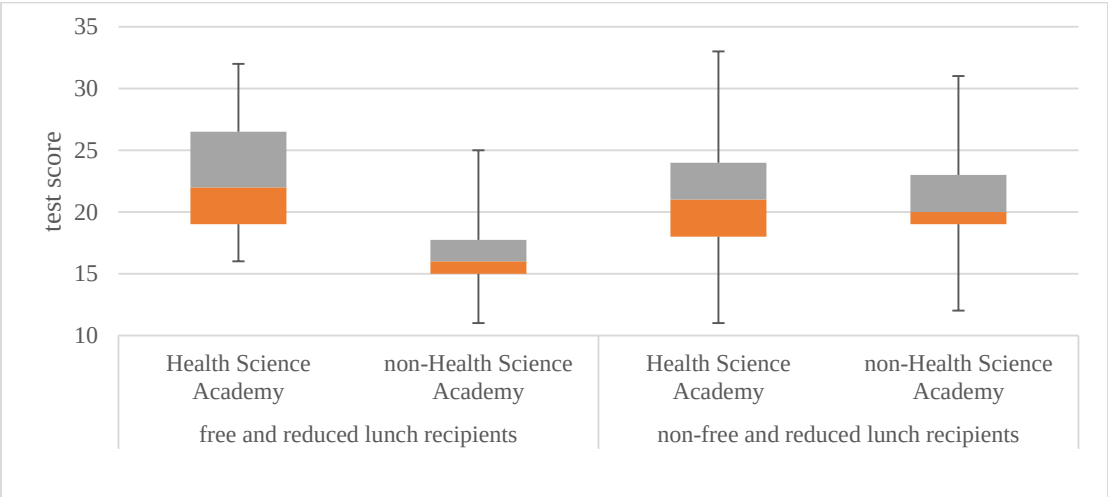

Figure 11. Composite ACT scores of 12th grade HSA and non-HSA student who do and do not receive free and reduced lunch benefits.

A two sample t-test was used to compare the number of credits earned toward graduation of HSA and non-HSA students. Health Science Academy students earned significantly more credits, after seven semesters, than non-HSA students, p=0.005 (Figure 12).

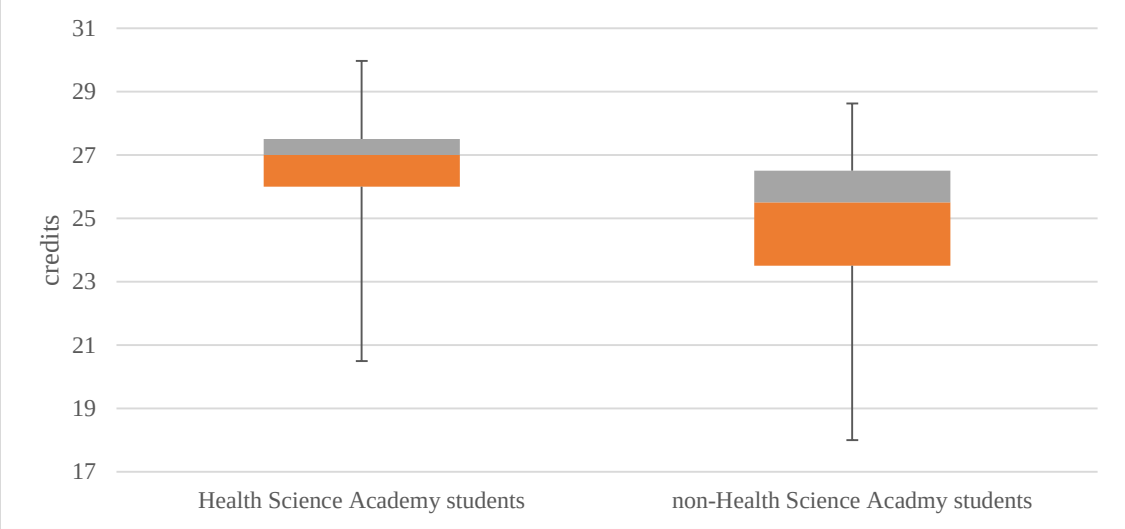

Figure 12. Number of credits earned, after seven semesters, by 12th grade HSA students (N=58) and non-HSA students (N=53).

The grade point averages of HSA and non-HSA 12th grade students were compared using a two sample t-test. Analysis showed that HSA students had a significantly higher grade point average than the non-HSA group, p=0.003 (Figure 13).

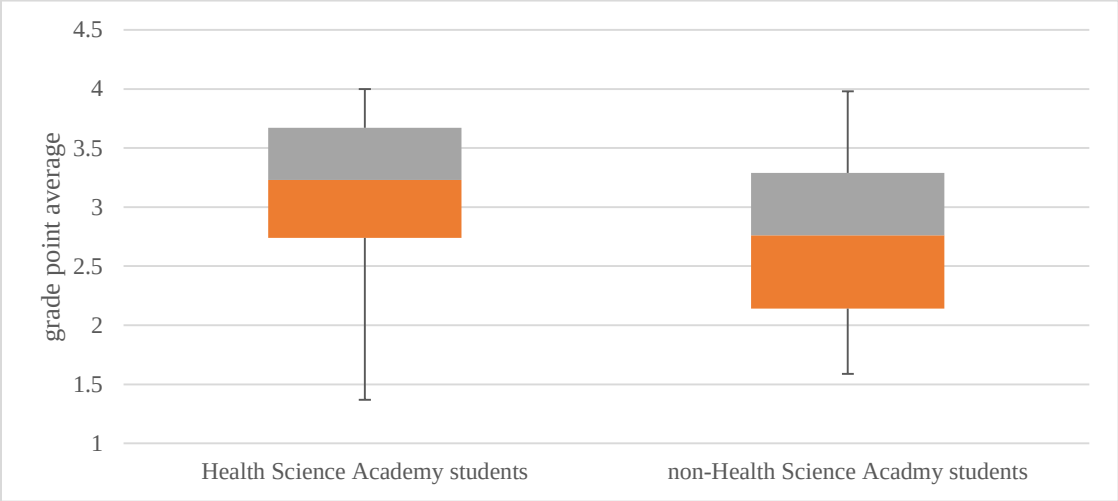

Figure 13. Grade point averages, after seven semesters, of 12th grade HSA students (*N*=58) and non-HSA students (*N*=53).

The 12th Grade Student Expectations Survey (Appendix B) was used to determine whether the HSA had an impact on students' preparedness for college. Over 93% of HSA students reported that at they intended to attend post-secondary education compared to 67.8% of non-HSA students. Twenty-one percent of non-HSA students planned on working immediately after high school. Most HSA and non-HSA respondents reported they had taken steps toward attending two- or four-year college but the percentages were higher for HSA students. All of the HSA respondents reported having taken the ACT or SAT, compared to 71.4% of non-HSA students. Ninety-seven percent of HSA students indicated they submitted a college application compared to 75% of non-HSA students. A higher percentage of HSA respondents reported they planned on graduating college (93.8%) than non-HSA students (67.9%), and 7.1% of non-HSA students reported they did not plan on pursuing post-secondary education. Roughly 68% of HSA respondents reported they had received a post-secondary scholarship compared to 33.9% of non-HSA respondents. Half of the HSA respondents reported that they *strongly agree* they will

find a career that will lead to financial security, lead a successful life, and have detailed knowledge of the requirements of obtaining a career that will lead to financial security. Most non-HSA respondents *agreed* with those three expectations, and more non-HSA then HSA respondents *disagreed*, and *strongly disagreed* with those three expectations (Table 2).

Table 2

Responses to 12th Grade Student Expectations Survey by HSA (N=32) and non-HSA (N=56) students.

Survey Item		Health Science Academy Respondents %	Non-Health Science Academy Respondents %
What are your plans for next year?			
	School only	28.1	21.4
	Work only	0	21.4
	Combine school and work	65.6	46.4
	Military	3.1	3.6
	Unknown	3.1	7.1
What steps have you taken towards 2-year or 4-year college admission?			
	Have taken no steps	0	12.5
	Researched collage options	90.6	71.4
	Took ACT or SAT	100	71.4
	Submitted an application	96.9	75
	Had an interview	28.1	14.3
What are your education expectations after high school?			
	Will not pursue education after high school	0	7.1
	Complete some post-secondary education or training	3.1	5.4
	Attend college	3.1	19.6
	Graduate from college	93.8	67.9
Have you received any scholarships?		68.8	33.9
I think I will easily find a career that will provide me financial security.			
	Strongly agree	50	26.8
	Agree	40.6	57.1
	Disagree	9.4	14.3
	Strongly disagree	0	1.8
I have the skills necessary to lead a successful life.			
	Strongly agree	62.5	39.3
	Agree	34.4	51.8
	Disagree	3.1	7.1
	Strongly disagree	0	1.8
I have detailed knowledge of the qualifications and training necessary for obtaining a career that will provide me financial security.			
	Strongly agree	50	28.6
	Agree	50	55.4
	Disagree	0	14.3
	Strongly disagree	0	1.8

Items were selected from the HSA Student Voice Survey and used to measure student attitude towards school and the HSA. Three items were used to measure students' sense of belonging to the academy (Figure 14). Seventy-nine percent of students *agreed* that the academy is a welcoming place, and 76% *agreed* that they are accepted for who they are in the academy. Seventy percent *agreed* that they are proud of the HSA. A senior girl said during an interview that the getting to know and work with the people in the HSA was one of the most rewarding aspects of being in the HSA. Another student said that she didn't expect the small learning community, before entering the HSA, but that the small learning community has made for a positive experience.

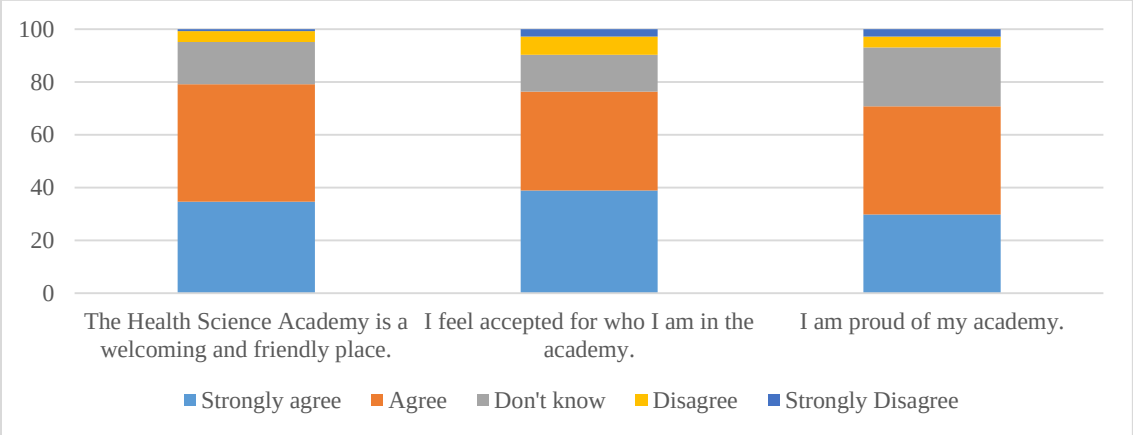

Figure 14. Responses of HSA Student Voice Survey used to measure students' sense of belonging, (*N*=144).

Four items were used to measure the level of interpersonal connections with academy staff members. Seventy-seven percent of students *agreed* that they have a teacher within the academy that they view as a positive role model, and 62% *agreed* that they know where to seek help with academy classes. Sixty-nine percent of students *agreed* that academy students respect them, but only 50% *agreed* that they had an academy teacher who they could talk to if they had a problem. A senior said that the

socials skill, she has developed while in the HSA, was one of the most rewarding aspects of being enrolled in the HSA. A freshmen girl thought that HSA teachers are caring and concerned and the level of teacher support was less outside the HSA (Figure 15).

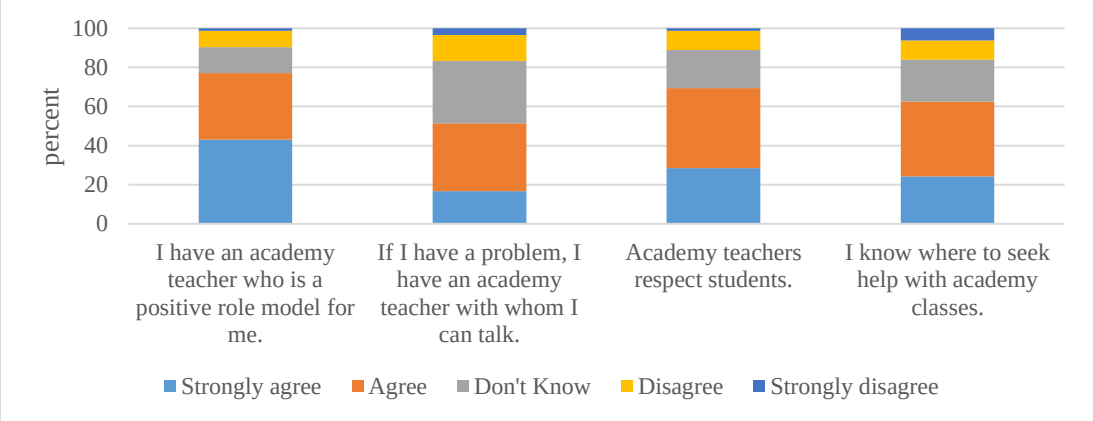

Figure 15. Responses of HSA Student Voice Survey used to measure students' perception of interpersonal connections within the HSA, (*N*=144).

Three different items were used to measure students' sense of accomplishment within the academy. Ninety-three percent of students *agreed* that getting good grades is very important, while 74% *agreed* that they understood the value of being in the academy. Sixty six percent of students *agreed* that they were encouraged to participate in extra-curricular academy events. All of the students interviewed had the perception that the HSA was more challenging than a normal high school course of study. Two students said the challenges they overcame freshmen year, made the challenges in subsequent years more manageable. Two senior girls regarded the experience in the HSA as "awesome" despite the number of challenges they said they faced. One of those senior girls thought that her high school experience would have been less stressful and easier had she not been in the HSA but she went on to say that such an experience would have

been less informative and that she "wouldn't be as smart." All students interviewed seemed to have a positive attitude about the academy because they felt confident that the challenges inherent to being an HSA student will pay dividends when pursuing their desired career (Figure 16).

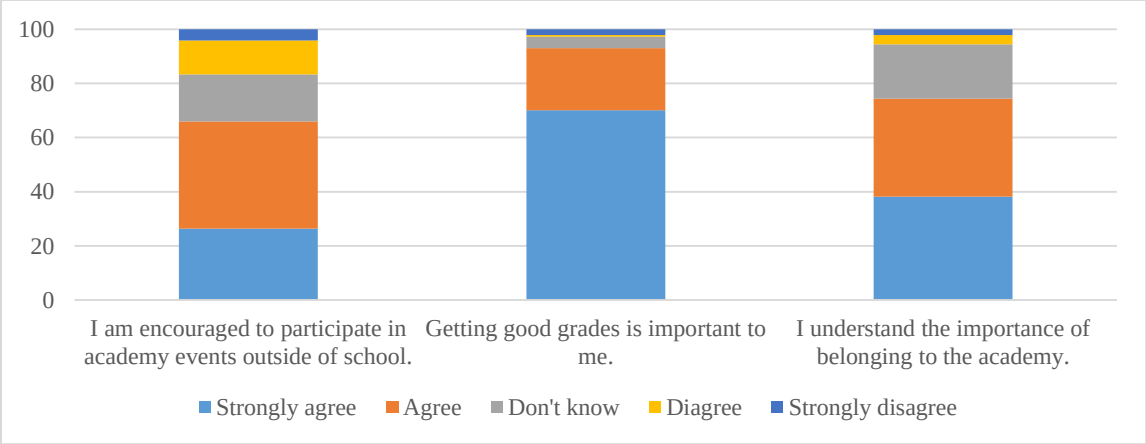

Figure 16. Responses of HSA Student Voice Survey used to measure students' sense of accomplishment within the HSA, (*N*=144).

Students' level of engagement was evaluated using five items from the HSA Student Voice Survey. Seventy-six percent of students *agreed* that they enjoyed being in the academy, 67% *agree* that being in the academy inspired them to learn, and 85% *agreed* that being in the academy would benefit their future. Eighty percent of students *agreed* that field trips supported their academy classroom learning and 73% *agreed* that they enjoyed the project-based learning approach of many academy classes. A freshmen boy thought that school would be less interesting outside the HSA because it would relate, as well, to his post-secondary aspirations. A senior girl said that she expected the HSA to be interesting and engaging and found that her four year experience in the HSA

aligned with those expectations. Another senior said that the hands-on experiences, field trips and job shadows very rewarding and impactful on her future (Figure 17).

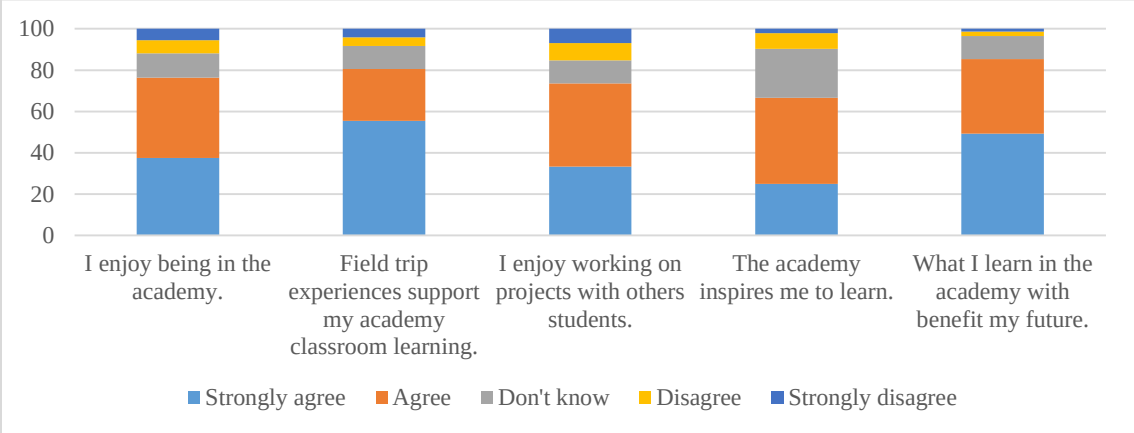

Figure 17. Responses of HSA Student Voice Survey used to measure students' level of engagement, (*N*=144).

Finally, five items were used to measure students' level of confidence as a result of being in the academy. Ninety-one percent of students *agreed* that they can be successful, and 69% *agreed* that academy teachers expect them to be successful. Eighty seven percent of students *agreed* that college is important to them, while 94% *agreed* they are excited about their future and 74% *agreed* the HSA is preparing them for their future. A sophomore boy said that his experience in the HSA made him realize that he would like to pursue a career in the medical field. A senior girl said that the job shadow experiences were rewarding and gave her confidence to choose and education and career path after high school. A freshmen girl is confident that she will have a "head start" going into college, as a result of being in the HSA, and that she is going "above and beyond" what is expected of students outside the HSA. All students interviewed enrolled in the HSA because they had an interest in the medical field and all indicated that the

challenges and opportunities that went along with being in the HSA would help them achieve their goals (Figure 18).

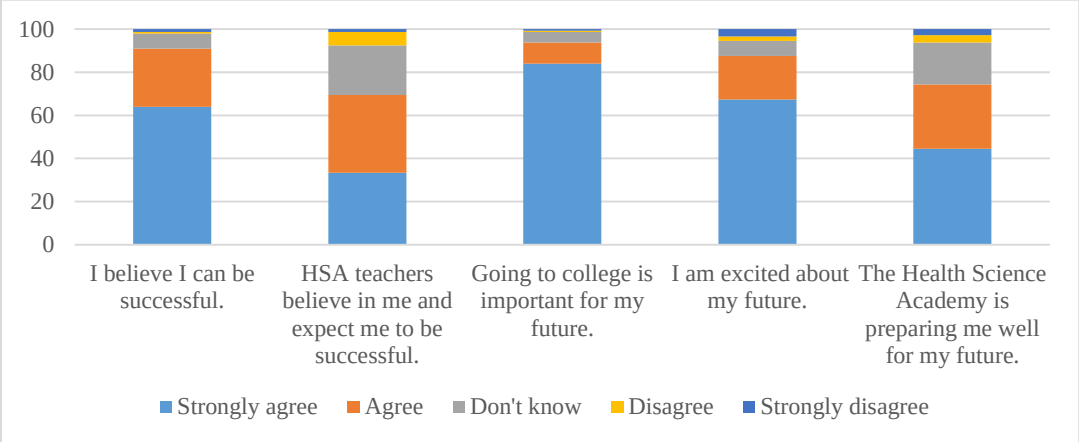

Figure 18. Responses of HSA Student Voice Survey used to measure students' level of confidence as a result of being in the HSA, (*N*=144).

INTERPRETATION

For the most part, Health Science Academy (HSA) students had significantly higher high school standardized test scores and significantly higher grade point averages than non-HSA students. At a glance it appears the HSA may have enhanced academic achievement but a comparison of 8th grade test scores, between HSA and non-HSA students, indicated that HSA students were entering high school as higher academic achievers than non-HSA students. Considering such trends, the impacts of the HSA on student achievement were inconclusive.

Free and reduced lunch benefits were used to gauge the economic status of student families. It is hypothesized that low income would put a student at higher risk of academic failure, and such a student could benefit from the supports of the HSA. In each of the four high school grade levels, HSA students had a lower percentage of free and

reduced lunch beneficiaries than the non-HSA control group indicating that the HSA was serving a group of students with an abnormally high degree of financial stability and thus, are at a lower risk of academic failure.

Health Science Academy students also seemed to have a lower risk of academic failure because they were higher academic achievers upon entering high school. Health Science Academy students in 11th and 12th grades had significantly higher reading, math, and science scores, on the eighth grade Montana Comprehensive Assessment System's Criterion Reference Test (CRT) than the non-HSA control group. Ninth and tenth grade HSA student also scored significantly higher on the eight grade science CRT than non-HSA students. At all four grade levels there were higher percentages of HSA students entering high school classified as *advance* or *proficient* on the CRT than non-HSA students. It is hypothesized that students entering high school with a poorer academic foundation will be less likely to pursue productive post-secondary educational opportunities, which is why these students receive the greatest benefit from career academies. The evidence suggests the HSA was not serving a high percentage of at-risk students, and was instead serving an abnormally high percentages of students entering high school predetermined to pursue post-secondary education.

The standardized test scores of HSA and non-HSA students in a variety of subgroups were compared in an effort to determine whether the HSA was enhancing the academic success of any particular subgroup. The observed trend was that when students in a subgroup entered the HSA with significantly higher test scores than non-HSA students, they also scored significantly higher on tests taken during high school. When there was no significant difference between HSA and non-HSA eighth grade test scores,

there was no difference between their high school test scores. For example, 11th grade HSA students who were classified as *advanced* or *proficient* on the eighth grade science CRT scored significantly higher on the eighth grade science CRT than their non-HSA counterparts, and they also scored significantly higher on the tenth grade science CRT. Eleventh grade HSA students, who received free and reduced lunch benefits, did not have significantly higher scores, than non-HSA students, on both the eighth and tenth grade science CRT. Because of such trends it cannot be concluded that the HSA is substantially enhancing the academic achievement of any particular subgroup.

One of the most striking discoveries of this study came by accident while collecting CRT scores. Ninety-two percent of 11th and 12th grade HSA students had eighth grade CRT scores that were accessible compared to only 68% of the non-HSA control group. Most students whose scores were inaccessible were transfer students from another school district. It could be argued that transient students are at a higher risk of failure than students who have been within a school district for an extended period, and it appeared that the HSA was missing that population of students.

One of the foundational principles of the career academy model is the fostering of college and career readiness. The total number of credits earned and ACT scores of 12th grade HSA versus non-HSA students were compared to determine whether the HSA was having a substantial positive impact on preparedness for college. Twelfth graders in the HSA had significantly higher ACT scores and earned significantly more credits than non-HSA students. Considering the achievement gap between HSA and non-HSA students upon entering high school it was challenging to infer that the difference in ACT scores

was attributed to the HSA. However, it can be inferred that the HSA was causing students to pursue more credits because of the required course of study.

The 12th Grade Student Expectations Survey was also used to assess students' preparedness for college. The survey indicated that the HSA was preparing students for post-secondary education because of the steps that HSA students had taken toward two- and four-year college admission. All of the HSA respondents had taken steps toward post-secondary education and nearly 94% of them reported that they planned on graduating from college. Health Science Academy students also seemed to have a more positive outlook on their futures than non-HSA students. Most HSA students *strongly agreed* that they would achieve financial security, had the skills necessary to lead a successful life, and were knowledgeable of the qualification of a career that would provide financial security. Very few HSA students *disagreed* or *strongly disagreed* with those three expectations. Sixty-nine present of HSA respondents reported they earned at least one scholarship as compared to 34% of non-HSA students. The HSA could be credited for this striking difference because of its rigorous course of study and the unique opportunities it provides.

The small learning community, common teachers, and HSA-specific courses are elements of the HSA that were supposed to increase students' sense of belonging and foster more and better interpersonal connections. Results of the HSA Student Voice Survey and student interviews indicate that these elements of the HSA are positively impacting students in the HSA. In general students appeared to have positive interpersonal connections with their teachers, but the results of the survey indicated that

improvements could be made. It is challenging to infer exactly what changes to recommend because of the limits of the data collected.

The HSA had a positive impact on students' level of engagement, confidence, and sense of accomplishment. The small learning community, common teachers, and HSA-specific courses allow for easier development of interdisciplinary lessons based on inquiry, project and problem-based learning, field trips, and thematic topics. Job shadows and opportunities for certification also impacted students because they provided insight about the pros and cons of a profession and, in many cases, provided inspiration and guidance for students making post-secondary plans.

VALUE

The Health Science Academy (HSA) was a major effort to reform the educational model at Big Sky High School (BSHS). The implementation of this well-intentioned reformation model consumed large amounts of time, energy, and money which is not unlike most program initiates introduced into educational systems. Considering such an expenditure of resources, in addition to the number of students it impacts, a new initiative like the HSA must undergo a rigorous evaluation of its impacts. Such an evaluation is rarely done, or done in a superficial manner. This study provided a rigorous evaluation of the HSA and laid the groundwork for the evaluation of current and future programs at BSHS. As a result of this study the impacts of the HSA will continue to be monitored with emphasis on a new set of questions that will attempt to validate benefits and provide a basis for identifying and improving weaknesses.

This study validated aspects of the HSA that are having a positive impact on students. Imbedded in the HSA course of study was a four-year strand of rigorous health

science-specific courses created by Project Lead the Way. These courses were classified as career and technical education credits but they more closely resemble upper level science courses. Because of these additional credits, many of which were quite rigorous, HSA students may be more effective in tackling the challenges associated with post-secondary academics.

Field trips, occupational research, student organizations, guest speakers, industry certifications, and job shadows provide opportunities that increased student awareness of health industry professions and the associated qualifications. Exposure to such information and opportunities makes a profession seem more accessible, which in turn could increase the likelihood of a student pursuing that profession. The primary goal of the HSA was to prepare students for success after high school and in today's economy, an important step toward success is post-secondary education. These results indicate that the HSA was effectively preparing students for post-secondary success and thus accomplishing its primary goal.

Preparedness of post-secondary success is a meaningful and useful measure of the HSA's success because it shows whether students are ready to tackle the challenges necessary to be successful in today's economy. However, future research must include a measure of graduates' actual post-secondary accomplishments. It is possible the HSA was fostering the illusion of post-secondary preparedness. In order to quell such a notion students should be tracked after graduation.

The HSA also seemed to be having a positive impact on students' attitude about school. The thematic nature of the HSA adds relevance to learning and challenges students to apply their knowledge to authentic problems. Making high school relevant is

one of the biggest challenges facing educators. The opportunities provided by the HSA have addressed this challenge and helped students realize high school is more than a formality and that it can be an impactful, influential, and educational experience that prepares them for college, career, and life.

By Montana standards, BSHS is a large school and it can be challenging for a student to go from a relatively small feeder school to such a large high school. A small learning community, such as the HSA, eases this transition because students are taking classes with a subset of the population, and in doing so more regularly work with people with whom they are familiar. Also, many of the students in the HSA have similar interests and aspirations which likely enhances an individual's sense of belonging.

The practicality of using academic achievement as a measure of program success was brought into question during this study. In order to make claims about the impacts of the HSA on student achievement a more detailed analysis must be conducted. Such analysis would entail measuring individual student growth throughout high school. Evaluating the impacts of the HSA on academic achievement by comparing the individual growth of HSA versus non-HSA students could still have its flaws. It could be challenging to conclude whether the academy model, the high concentration of low-risk students, or the individual teaching styles of the teachers within the HSA was having the impact. Perhaps measuring academic achievement impacts of a program, such as the HSA, is not a fair or realistic means of evaluating a program's effectiveness.

While academic achievement is important, it is only one of the many facets of a successful secondary educational program. As the evaluation of the HSA continues, more emphasis needs to be put on measuring the impacts on student development,

citizenship and engagement, and actual post-secondary success. Critics of the academy model argue that the necessary course of study detracts from the humanities which is a necessary component of a holistic education. This concern should be addressed in future research which would entail the analysis of individual students' schedules and participation in voluntary and extracurricular activities.

The development of additional career academies at BSHS was directly impacted by this study. The HSA is having a positive impact on hundreds of students at Big Sky High School, but this study has shown that that population includes an abnormally low percentage of at-risk students. It will be essential to design a new career academy at BSHS that will be engaging and available to at-risk students. It is likely the new academy at BSHS will be themed around construction and engineering in an effort to create a program that is more appealing to males. Approximately 70% of HSA students were female, and data collected by the BSHS administration showed that males, especially freshmen, were experiencing the greatest challenges in being academically successful.

Regardless of the academy theme, recruitment of eighth grade students for career academies at BSHS must be less passive. Under the current system, interested eighth graders submit their applications voluntarily following a visit from a recruiting team. As a result, the HSA is drawing students who are looking to maximize their high school experience by partaking in this high-profile academic program. These students are often higher achievers and from stable and supportive families. More needs to be done to actively pursue students who are suffering academically and are from families who are facing financial instability because these are the students who are underserved by the

current secondary model and could benefit most from the reformation efforts of a career academy. Often times these are the students who slip through the cracks because they do not have the skills to seek out opportunities and advocate for themselves.

The HSA, and future career academies at BSHS, need to be more accessible to transfer students. Because of the four-year course of study required by the HSA, students who transfer to BSHS are unable to partake in the HSA. A program like the HSA could ease the transition into a new school because it is a small learning community of teachers and students who could provide an advanced level of support. While the model that the HSA is based on is well-established and beneficial to a set of students at BSHS, future academies at BSHS should be structured in such a way that transfer students can enroll and benefit from their supports.

This study has provided a basis for reflecting on my current teaching practice and the goals I set for myself when I entered the profession. My goal as a nascent science teacher was to empower students with the skills and knowledge necessary to live a satisfying life and make meaningful contributions to their community. In the past eight years I think I have slowly lost sight of *who* I am teaching and began putting too much focus on *what* I am teaching. Data from this study indicates that student-teacher relations could be improved, and I understand how my current mindset has contributed to these results. I need to refocus on my students, develop deeper connections with them, and provide them with learning experiences that are authentic and constructive. The HSA provides the perfect venue for accomplishing this because the nature of its organization fosters the opportunity for thematic, interdisciplinary learning experiences.

I have gained a greater awareness of the diversity in my classroom as a result of this study. I was surprised to find how many transient students there are at Big Sky High School and now feel compelled to advocate for them and promote programs and initiatives to support them. The high percentage of low-income students at BSHS seemed much more real to me after collecting the data. After discovering the identities of these students I realized they are students with whom I usually have minimal contact. For many of these students, whether they know it or not, education is their ticket to a more comfortable life and I, as a teacher, am the bridge that connects them to that education. Arguably, these are the students that need me and the HSA the most because their vision of a prosperous future is hazy. I need to encourage them and help them understand that education can be empowering. I must make a strong effort to identify and connect with these students and provide the support they need to leave high school ready to tackle the challenges ahead of them and live a satisfying and meaningful life.

Much of the same could be said about students who are entering high school as low academic achievers. These kids are at high risk of failure and could benefit greatly from the structure of a career academy. In order for that to happen I need to identify them early and provide them with the supports necessary to be successful. Theoretically, the thematic nature of the HSA should bolster their level of engagement and motivation, but I need to put appropriate instructional and assessment strategies in place for these students to effectively learn and demonstrate their level of mastery.

Using data to influence school-wide programs and classroom instructional strategies can be challenging because of the difficulties associated with accessing the information and the time required for analysis. During the course of this study I learned

how to access data and gained insight into the types of data that are most useful. This study provided a starting point from which an annual evaluation of the HSA can be developed. Knowing how to gather and analyze the data, and having a better idea of the types of data that are useful, is the most challenging aspect of initiating this type of evaluation. Having cleared these hurdles I intend to continue this research because it is a necessary step toward the development of a successful program.

This study has resulted in a big boost in my confidence as a professional. The HSA has become a focal point of BSHS and it was empowering to be the individual spearheading the effort to evaluate its impacts. Through this process I have developed a deeper understanding of the philosophy of career academies and have become a resource for those seeking information about the HSA. Because of this study I was asked to be part of a strategic planning committee charged with the task of planning the implementation of a second career academy at BSHS. For these reasons I have gained confidence in my ability to have impacts that extend beyond my classroom and to the entire school.

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APPENDICES

APPENDIX A

MSU INSTITUTIONAL REVIEW BOARD EXEMPTION

MONTANA
STATE UNIVERSITY

INSTITUTIONAL REVIEW BOARD

For the Protection of Human Subjects
FWA 00000165

960 Technology Blvd. Room 127
c/o Immunology & Infectious Diseases
Montana State University
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MEMORANDUM

TO: Robert Ellenbecker and John Graves

FROM: Mark Quinn, Chair Mark Quinn CTJ

DATE: November 30, 2015

RE: *"How Does the Health Science Academy at Big Sky High School Affect Student Achievement and Preparedness for College?" [RE113015-EX]*

The above research, described in your submission of November 25, 2015, is exempt from the requirement of review by the Institutional Review Board in accordance with the Code of Federal regulations, Part 46, section 101. The specific paragraph which applies to your research is:

_X_ (b) (1) Research conducted in established or commonly accepted educational settings, involving normal educational practices such as (i) research on regular and special education instructional strategies, or (ii) research on the effectiveness of or the comparison among instructional techniques, curricula, or classroom management methods.

_X_ (b) (2) Research involving the use of educational tests (cognitive, diagnostic, aptitude, achievement), survey procedures, interview procedures or observation of public behavior, unless: (i) information obtained is recorded in such a manner that human subjects can be identified, directly or through identifiers linked to the subjects; and (ii) any disclosure of the human subjects' responses outside the research could reasonably place the subjects at risk of criminal or civil liability, or be damaging to the subjects' financial standing, employability, or reputation.

____ (b) (3) Research involving the use of educational tests (cognitive, diagnostic, aptitude, achievement), survey procedures, interview procedures, or observation of public behavior that is not exempt under paragraph (b)(2) of this section, if: (i) the human subjects are elected or appointed public officials or candidates for public office; or (ii) federal statute(s) without exception that the confidentiality of the personally identifiable information will be maintained throughout the research and thereafter.

____ (b) (4) Research involving the collection or study of existing data, documents, records, pathological specimens, or diagnostic specimens, if these sources are publicly available, or if the information is recorded by the investigator in such a manner that the subjects cannot be identified, directly or through identifiers linked to the subjects.

____ (b) (5) Research and demonstration projects, which are conducted by or subject to the approval of department or agency heads, and which are designed to study, evaluate, or otherwise examine: (i) public benefit or service programs; (ii) procedures for obtaining benefits or services under those programs; (iii) possible changes in or alternatives to those programs or procedures; or (iv) possible changes in methods or levels of payment for benefits or services under those programs.

____ (b) (6) Taste and food quality evaluation and consumer acceptance studies, (i) if wholesome foods without additives are consumed, or (ii) if a food is consumed that contains a food ingredient at or below the level and for a use found to be safe, or agricultural chemical or environmental contaminant at or below the level found to be safe, by the FDA, or approved by the EPA, or the Food Safety and Inspection Service of the USDA.

Although review by the Institutional Review Board is not required for the above research, the Committee will be glad to review it. If you wish a review and committee approval, please submit 3 copies of the usual application form and it will be processed by expedited review.

APPENDIX B

12th GRADE STUDENT EXPECTAIONS SURVEY

Participation in this research is voluntary and participation or non-participation will not affect a student's grades or class standing in any way.

1. In what programs are you currently involved (check all that apply)?
    - Athletics
    - Health Science Academy
    - DECA
    - Band/choir
    - Speech and Debate
    - Other _____
2. What are your plans for next year (check only one)?
    - School only
    - Work only
    - Combine school and work
    - Millitary
    - Unknown
3. What steps have you taken towards 2-year or 4-year college admission (check all that apply)?
    - Researched college options. This includes: talking with parent or advisors about college, discussing financing with parents, looking at college catalogues and visiting schools.
    - Took SATs or ACTs
    - Submitted an application
    - Had an interview

4. What are your education expectations after high school (check only one)?
    - Complete some post-secondary education.
    - Attend college
    - Graduate from college
5. Please list any scholarships that you KNOW you have received, either from an agency or from the college you are attending, if applicable.
    1)
    2)
    3)
    4)
    5)
    6)
    7)
6. I think that I will easily find a career that will provide me financial security? (After High School graduation, or after receiving your qualifications)
    - Strongly agree
    - Agree
    - Disagree
    - Strongly disagree
7. I have the skills necessary to lead a successful life.
    - Strongly agree
    - Agree
    - Disagree

- Strongly disagree

8. I have detailed knowledge of the qualifications and training necessary for obtaining a career that will provide me financial security.
    - Strongly Agree
    - Agree
    - Disagree
    - Strongly disagree

APPENDIX C

HSA STUDENT VOICE SURVEY

Participation in this research is voluntary and participation or non-participation will not affect a student's grades or class standing in any way.

* Required
Grade Level *
❑ 9
❑ 10
❑ 11
❑ 12

The Health Science Academy is a welcoming and friendly place. *
1. Strongly Agree 2. Agree 3. Don't Know 4. Disagree 5. Strongly Disagree

I feel accepted for who I am in the academy. *
1. Strongly Agree 2. Agree 3. Don't Know 4. Disagree 5. Strongly Disagree

Academy teachers make an effort to get to know me. *
1. Strongly Agree 2. Agree 3. Don't Know 4. Disagree 5. Strongly Disagree

I am a valued member of the HSA community. *
1. Strongly Agree 2. Agree 3. Don't Know 4. Disagree 5. Strongly Disagree

My parents care about my education. *
1. Strongly Agree 2. Agree 3. Don't Know 4. Disagree 5. Strongly Disagree

I am proud of my academy. *
1. Strongly Agree 2. Agree 3. Don't Know 4. Disagree 5. Strongly Disagree

I have an academy teacher who is a positive role model for me. *
1. Strongly Agree 2. Agree 3. Don't Know 4. Disagree 5. Strongly Disagree

HSA teachers care if I am absent from school. *
1. Strongly Agree 2. Agree 3. Don't Know 4. Disagree 5. Strongly Disagree

If I have a problem, I have an academy teacher with whom I can talk. *
1. Strongly Agree 2. Agree 3. Don't Know 4. Disagree 5. Strongly Disagree

Academy teachers respect students. *
1. Strongly Agree 2. Agree 3. Don't Know 4. Disagree 5. Strongly Disagree

I am encouraged to participate in academy events outside of school. *
1. Strongly Agree 2. Agree 3. Don't Know 4. Disagree 5. Strongly Disagree

I understand the importance of belonging to the academy. *
1. Strongly Agree 2. Agree 3. Don't Know 4. Disagree 5. Strongly Disagree

My classes are more focused on the curriculum. *
1. Strongly Agree 2. Agree 3. Don't Know 4. Disagree 5. Strongly Disagree

I am encouraged to practice good citizenship at school. *
1. Strongly Agree 2. Agree 3. Don't Know 4. Disagree 5. Strongly Disagree

I give up when schoolwork is difficult. *
1. Strongly Agree 2. Agree 3. Don't Know 4. Disagree 5. Strongly Disagree

I have considered leaving/dropping the academy. *
1. Strongly Agree 2. Agree 3. Don't Know 4. Disagree 5. Strongly Disagree

Getting good grades is important to me. *
1. Strongly Agree 2. Agree 3. Don't Know 4. Disagree 5. Strongly Disagree

In my opinion, attending all my classes is worth my time. *
1. Strongly Agree 2. Agree 3. Don't Know 4. Disagree 5. Strongly Disagree

I enjoy being in the academy. *
1. Strongly Agree 2. Agree 3. Don't Know 4. Disagree 5. Strongly Disagree

Teachers make the academy an exciting place to learn. *
1. Strongly Agree 2. Agree 3. Don't Know 4. Disagree 5. Strongly Disagree

School is not boring. *
1. Strongly Agree 2. Agree 3. Don't Know 4. Disagree 5. Strongly Disagree

I know where to seek help with academy classes. *
1. Strongly Agree 2. Agree 3. Don't Know 4. Disagree 5. Strongly Disagree

Teachers have fun in the academy. *
1. Strongly Agree 2. Agree 3. Don't Know 4. Disagree 5. Strongly Disagree

My HSA teachers present lessons in a different way than nonHSA teachers. *
1. Strongly Agree 2. Agree 3. Don't Know 4. Disagree 5. Strongly Disagree

I enjoy working on projects with others students. *
1. Strongly Agree 2. Agree 3. Don't Know 4. Disagree 5. Strongly Disagree

The academy inspires me to learn. *
1. Strongly Agree 2. Agree 3. Don't Know 4. Disagree 5. Strongly Disagree

What I learn in the academy with benefit my future. *
1. Strongly Agree 2. Agree 3. Don't Know 4. Disagree 5. Strongly Disagree

I like challenging assignments. *
1. Strongly Agree 2. Agree 3. Don't Know 4. Disagree 5. Strongly Disagree

I push myself to do better academically. *
1. Strongly Agree 2. Agree 3. Don't Know 4. Disagree 5. Strongly Disagree

HSA teachers help me learn from my mistakes. *
1. Strongly Agree 2. Agree 3. Don't Know 4. Disagree 5. Strongly Disagree

Field trip experiences support my academy classroom learning. *
1. Strongly Agree 2. Agree 3. Don't Know 4. Disagree 5. Strongly Disagree

Students have a voice in decision making in the academy. *
1. Strongly Agree 2. Agree 3. Don't Know 4. Disagree 5. Strongly Disagree

I see myself as a leader. *
1. Strongly Agree 2. Agree 3. Don't Know 4. Disagree 5. Strongly Disagree

Other students see me as a leader. *
1. Strongly Agree 2. Agree 3. Don't Know 4. Disagree 5. Strongly Disagree

HSA teachers encourage students to make decisions. *
1. Strongly Agree 2. Agree 3. Don't Know 4. Disagree 5. Strongly Disagree

I believe I can be successful. *
1. Strongly Agree 2. Agree 3. Don't Know 4. Disagree 5. Strongly Disagree

Academy teachers are willing to learn from their students. *
1. Strongly Agree 2. Agree 3. Don't Know 4. Disagree 5. Strongly Disagree

HSA teachers believe in me and expect me to be successful. *
1. Strongly Agree 2. Agree 3. Don't Know 4. Disagree 5. Strongly Disagree

Going to college is important for my future. *
1. Strongly Agree 2. Agree 3. Don't Know 4. Disagree 5. Strongly Disagree

I am excited about my future. *
1. Strongly Agree 2. Agree 3. Don't Know 4. Disagree 5. Strongly Disagree

The Health Science Academy is preparing me well for my future. *
1. Strongly Agree 2. Agree 3. Don't Know 4. Disagree 5. Strongly Disagree

APPENDIX D

HSA STUDENT INTERVIEW

Participation in this research is voluntary and participation or non-participation will not affect a student's grades or class standing in any way.

1. What is your grade level?
2. Why did you enroll in the Health Science Academy?
3. What were your expectations of the Health Science Academy?
4. Did the Health Science Academy meet, not meet or exceed those expectations?
5. What elements of the Health Science Academy had the greatest impact in preparing you for your future?
6. How would your high school experience have been different if you were not enrolled in the Health Science Academy?
7. What was the most rewarding aspect of being enrolled in the Health Science Academy?
8. What was the most challenging aspect of being enrolled in the Health Science Academy?
9. How has the Health Science Academy affected your post-secondary plans?
10. How would you describe the Health Science Academy to someone who was unfamiliar with it?
11. Is there anything else you would like me to know?