

**MEETING THE NEEDS OF CAREER AND TECHNICAL EDUCATION:
OBSERVATIONS FROM GRADUATES OF A HIGH SCHOOL
HEALTH SCIENCE PROGRAM**

By

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CHAPTER 1

Introduction

The traditional American high school has represented a turning point in the lives of our students at which they must choose to pursue college or career and prepare for the next step in their lives (Richmond, 2010). While the present day American high school has both similar and different challenges than in the past, many districts have been trying new programs to develop and progress toward serving the needs of students for success in life. Educators need to be prepared to continuously scrutinize the curriculum with two questions. First, will those who do not move on to higher education, as well as those who do be prepared to meet the demands of the 21st century workforce? Second, if they will not be prepared, how can education help them to become more prepared (Horne, 2010)?

Taking this holistic approach to education will be a challenge, but it is a great opportunity for educators to contribute in developing a skilled, competitive, and adaptive generation of high school graduates (Horne, 2010). Traditional colleges and universities have served the needs of some high school graduates in preparing them for transition into a career. In addition, community colleges and technical institutes play an important role in implementing and improving such transition programs, serving for many years as the primary location for workforce training (Bragg & Ruud, 2007).

If the traditional American high school follows the lead of community college with a strong technical education program, students can begin to prepare even before they leave high school. Career and technical educators and students benefit when the

emphasis is on application rather than just acquisition of knowledge (Horne, 2010). Career and Technical Education (CTE) transition programs at the secondary level play an increasingly important role within community colleges' curricula by providing an avenue for youth and adults to progress to the post-secondary level and prepare for careers or transfer to four-year college and workforce training (Cohen & Brawer, 2003; Hughes & Karp, 2006).

Providing basic training to students in a sub-baccalaureate setting can also provide them with an opportunity to work in a career field setting while going to school in a post-secondary institution. Secondary students who graduate with a CTE concentration are 2.5 times more likely to be employed while pursuing post-secondary education than are college prep students, according to the Southwest Regional Education Board (SREB, 2011). In addition, a Bill and Melinda Gates Foundation report in 2004 stated that 81% of students who dropped out of high school stated that they would have been more influenced to stay in school if it had more real-world learning as a part of the daily curriculum.

While traditional programs in CTE have been around and evolved throughout the years, the need to meet the demands of the workforce have enabled secondary programs to develop new and stronger programs in CTE. Over the past quarter century, CTE programs include finance, hospitality, and health science. The demand for workers in health careers is high, and the types of health occupation careers are changing rapidly (O'Sullivan Mailett & D'Anna, 2001). Government projections estimate that nationwide, overall healthcare employment will grow by 22 percent between 2006 and 2016. Allied Health professions such as dental hygiene, physical

therapy, and laboratory technicians and biotechnologists are those that are currently in demand and will continue to be in demand through the course of the next decade (Wolgemuth, 2009).

Over the course of the past two decades, secondary health science CTE programs have been developed to meet the needs of the workforce and to prepare our students for careers in their program. Flexibility is critical, however, because the health care field itself is constantly changing and as it changes, so too must CTE programs in order to meet the demands of the workforce. The October 1991 report of the Pew Health Professions Commission, entitled *Healthy America: Practitioners for 2005*, stated that educational programs should offer greater flexibility to allow earlier access to professional training, interprofessional training, and multi-competency training. It also stated that programs should offer the opportunity to explore professional career options more fully (O'Sullivan Mailett & D'Anna 2001).

Lincoln Public Schools (NE) is a school district in Lincoln, Nebraska, which serves over 35,000 students (Lincoln Public Schools, 2011). The district has six traditional public high schools with one alternative high school and four focused programs developed on science, information technology, arts and humanities, and entrepreneurial careers/interest areas. Current enrollment in each of the traditional high schools varies from approximately 1,200 students to 2,100 students.

In the fall of 2004, Lincoln school district officials in charge of curriculum and Career and Technical Education began to survey programs that would expand and enhance the current CTE programs in place. Curriculum planning and development

took place to develop a stand-alone health science program built into one of the six traditional high schools (Lincoln Public Schools, 2011).

The first courses were piloted in the spring semester of 2005 at the pilot high school with the intention of providing similar courses and programs at all six of the district's traditional high schools with five course offerings and a health sciences pathway established for all students who were interested in taking coursework in health sciences (Lincoln Public Schools, 2011). The courses that were established within the pathway included Introduction to Health Sciences, Medical Terminology, Anatomy and Physiology, and Fundamentals of Health Careers (Basic Nurses Assisting). Working in cooperation with the local community college, two of the three courses have been offered for articulated and dual credit with the college and students who pass the state certification test in the Fundamentals of Health Careers course are awarded certification in Basic Nurses Assisting in the State of Nebraska.

The mission of Lincoln Public Schools Career and Technical Education has been to prepare all individuals to learn through career exploration and technical skill development while meeting academic standards, earning as productive citizens in a global society, and living as a contributing member of their community (Lincoln Public Schools, 2011). The overall CTE program aims to provide students with knowledge and skills to live and work as productive individuals who are successful in their work, family and community.

In addition, the program seeks to provide students with educational experiences for personal and professional growth and preparation to meet the challenges of a fast-changing workforce (LPS, 2011). Ultimately, Lincoln Public

Schools desires its students to have a smooth transition through the education system into the workplace and/or post-secondary education (LPS, 2011). The Career and Technical Education program in Lincoln Public Schools has been delivered through a variety of programs of study in the Nebraska Career Fields. Business/Technology, Family and Consumer Sciences, Health Sciences, and Industrial Technology have been the four disciplines of focus within Lincoln Public Schools CTE program.

With this mission in mind, the curriculum was developed in an attempt to meet the overall goals of the District CTE program. The numbers of students enrolled in the program and schools offering the curriculum has grown from one to six high schools from 2005 to 2011 and courses and curriculum continue to expand. The mission of the program focuses on ideologies and benchmarks that occur after the students have completed the programs, but there has not been any data collection beyond students who are currently enrolled in the program. The current data that have been collected include student grades/progress, state certification test data, course surveys, and enrollment figures.

Statement of the Problem

The purpose of the study was to identify current academic and/or career pursuits and perceptions of success of health care students in the workforce following completion or graduation of secondary school. The study sought to determine perceptions of graduates from the pilot high school of the overall effectiveness of their health care introduction program and the extent to which courses contributed to reaching the overall mission of Career and Technical Education within the district. The student respondents were students who had taken courses in the Health Science

program at the pilot high school and had graduated from the pilot high school within the past four academic years.

Research Questions

The following research questions guided the study:

1. To what extent did graduates of the high school health sciences program pursue enrollment in a post-secondary health science program?
2. What are the perceptions of these graduates regarding the extent to which participating in the District Health Sciences CTE course led to completion of a post-secondary health science program?
3. What are the perceptions of these graduates regarding the extent to which participation in a District Health Sciences CTE course developed skills that are helpful in transitioning into workforce jobs related to health science after high school?
4. What is the relationship between number of courses taken in the Health Sciences Program and likelihood of enrollment in a health sciences program following graduation?
5. What are the perceptions of these graduates regarding the extent to which specific skills/learning opportunities that are taught within the high school health science curriculum were important to students in post-secondary programs?

6. To what extent do the perceptions of students regarding their post-secondary experiences following participation in the high school program differ based on gender of the student?
7. To what extent do the perceptions of students differ regarding their post-secondary experiences following participation in the high school program based on what year the students graduated from high school?

Significance of the Study

The study focused on a follow-up study regarding the impact of the Health Occupations Programs and courses within the Lincoln, Nebraska, school district. It sought to add to and enhance the current existing data related to current students in the program and provided the district with data collected among students following graduation from an existing high school within the district. The study used descriptive data to track and examine the impact and relevance of current curriculum and its relationship with effective student success following completion of high school. The study should be a useful tool for the Lincoln school district officials and administrators in determining some of the best practices for achieving student success after graduation. In addition, it should serve as a useful curriculum development tool for classroom teachers who are involved in Health Science Career and Technical Education to determine what portions of the curriculum have the greatest impact on student success.

Definition of Terms

The following terms are listed for the reader to be familiar with regular language in the study that may not be previously understood by the reader or refined by the author to give the terms more personal meaning.

Best Practices—A method or technique that has consistently shown marks superior to other methods, and that is used as a benchmark.

Career and Technical Education (CTE)—The broad field of education encompassing the specialized skills and education of technical work professions (Association for Career and Technical Education, 2011)

Career Ready— Having obtained the three broad sets of skills necessary to be ready for a career: Educational, Technical, and Employability skills. (Association for Career and Technical Education, 2011)

Enrollment Rates—The number of individuals who sign up, or enroll in a particular program.

Graduation Rates—The number of individuals who complete a degree or certification conferring program.

Health Science Careers— Any career requiring some formal training in the health science industry.

Learning Opportunities— Any activity, lesson, unit, or extra-curricular activity or seminar that provides the student the potential to gain information relevant to Health Science.

Post-Secondary Health Sciences Program—Any program following secondary school that leads to certification and/or graduation from a health program. It could include programs from community colleges, universities, hospitals, and other accredited Health Science Institutions.

Limitations and Delimitations of the Study

This study was limited by the size of the population. Due to school district limitations on contact information for students following graduation, students were only selected at one pilot high school in which the researcher currently worked with students. The study was also limited to students over the past four graduation years because the program was new to the district. One additional limitation was the age of majority in Nebraska. Those students graduating in the 2011 year would have to have turned 19 prior to the March 12th survey deadline in order to participate. This could have had an effect on up to 15 respondents.

The study was delimited to the responses of students who had taken and graduated from the specific health sciences pilot program and school. The demographic delimitations include student's income, age, number of courses taken, grade point average, and gender. The demographic information was selected to determine whether or not differences existed in gender, as well as the number of courses taken, in reference to satisfaction with the program.

Organization of the Study

Chapter 1 has presented a general introduction to health science and the need for a comprehensive Career and Technical Education Program in secondary school programs. In addition, background information was provided regarding the school

district and the health science program within it. Chapter 1 has also provided a statement of the problem, subsequent research questions, significance of the study, and definition of terms.

Chapter 2 contains the review of related literature relevant to health science programs and overall career readiness from Career and Technical Education programs. The review gives an historical perspective on CTE and the fundamental mission of technical education and, more specifically, health science education. In addition, the review provides the reader background information on Health Science Education and what current workforce demands are in the related field. Finally, the review provides the reader with current intentions of technical education and what skills the health science field desires from students entering the field. The review concludes with literature related to projected student achievement in relation to participation in CTE Career mentoring programs.

The methodology section describes the procedures and instrumentation used to gather the data for the study. The chapter describes data collection methodology and the analysis of the collected data. In addition to procedures and instrumentation, Chapter 3 also includes reference databases and processes used to compile related literature to the problem being studied.

In Chapter 4, analysis of the data and findings that emerged from the study are discussed. All of the results of the study are presented. In addition, a discussion of those results are presented.

Chapter 5 contains a summary of the study and the findings. In addition, conclusions based on the study are discussed, as well as recommendations for practice and further study.

CHAPTER 2

Review of Selected Literature and Research

Health care in the United States is currently at a crossroads. It is estimated that by 2030, there will be about 71.5 million older Americans who will require at least basic health care services, more than twice the amount that there were at the turn of the millennium (Reese, 2007). The number of vacant health care professional positions in nursing homes in 2007 was 810,000 and growing by the day (Reese, 2007).

The generation known as the *Baby Boomers* is aging and healthcare provisions need to be put into place to ensure their overall health and well-being. Many health care workers themselves are of this generation and are reaching or are beyond retirement age, which also creates greater demand for health care workers in the United States (Reese, 2007). With retirement of this generation, the high school students of today will be needed more than ever to assist as a workforce capable of meeting the needs of this population. It is absolutely necessary that a community and school district provide the appropriate resources to meet these needs and to make technical education and career planning a high priority (Metcalf, 2010).

With the ever-evolving state of Career and Technical Education in the United States, the focus on Vocational Education as an alternative to college preparation has now shifted to include an educational pathway for all students in secondary education, linking the schools and the workforce together (Bersudskaya, Chen 2011). Health sciences are taking advantage of this new approach to occupational education to provide relevance and technical skill development for both the College Prep

enrollee and the student who anticipates using their certification for immediate gainful employment.

In 2004, a study by the National Center for Education Statistics investigated Career and Technical Education Students to determine their current career pathway. The national study found that 80.1% of students who had completed at least two credits of Health Science courses at the secondary level were currently enrolled in a post-secondary health science program of study. Of the remaining 19.9% of students, nearly 18% of those students never enrolled in a program but worked for pay in their occupational focus area (Bersudskaya, Chen 2011). With 98% of students using their training in secondary school CTE to develop or begin a career in health care, we can understand the need for providing “opportunities for the young, care for the elderly, and a more hopeful future for all members of their communities” (Reese, 2007, p. 24).

History of Health Care and Career Education

Career and Technical Education, which used to be called vocational education, originated in the early 20th century (Gordon, 2003; Gray & Herr, 1998). Most early vocational programs were designed with the ideas and concepts of training potential workforce in the construction trades, factories and farms (Fletcher, 2006).

Typical with nearly all components education, Career and Technical Education has been historically shaped by the federal government. Throughout the past three decades, educational policy and transformations such as ESEA, *A Nation at Risk*, and *No Child Left Behind* have changed the face of Career and Technical Education even when intention to directly change CTE was not there (Fletcher,

2006). For example, an increase in focus, spending, and attention to success in the core curricular areas of education due to No Child Left Behind has indirectly and negatively effected the focus, spending, and attention toward Career and Technical Education. Such reform can be witnessed throughout the history of CTE in the United States public education system (Fletcher, 2006).

While sometimes devalued and not always the main focus of educational policy, the federal government education leaders have always had an understanding of the importance of CTE in public schools for the benefit of US economic growth, stability, and for the development of productive citizenry (Fletcher, 2006). Some of the earlier acts by Congress that reinforced belief in Career and Technical Education included the Smith-Hughes Act of 1917, the George-Reed Act of 1929, and the George-Dean Act of 1937 (Pulliam & Van Patten, 2007). The Smith-Hughes Act provided federal aid to individual states who participated in vocational education. The aid came in the form of federal funding of salaries for all vocational teachers in the high school and also added funding for teachers colleges to assist in the training of these vocational educators (Pulliam & Van Patten, 2007). While it required the states which were granted aid to match that aid, it brought vocational education to the forefront and created a priority for vocational education in the United States (Gordon, 2003).

A little more than a decade after the Smith-Hughes Act was enacted, the George-Reed Act of 1929 was passed. The George-Reed Act sought to increase and secure training and funding for vocational teachers in the CTE areas of agriculture and home economics. It was the second piece of legislation that provided training for

vocational education and provided a foundation for teaching vocational skills in schools, rather than on the job, which was the common practice of the late 1800s (Gordon, 2003). Finally, the George-Dean Act of 1937 extended the original George-Reed Act to include all of the US territories and increased the funding to an unprecedented 12 million dollars (Pulliam & Van Patten, 2007).

The original intent of early legislation in vocational education was to provide the United States with a skilled workforce that reached out to a larger audience or student base (Pulliam & Van Patten, 2007). More recently, however, Congress has turned its attention to CTE in order to provide an edge in economic growth and development (Fletcher, 2006). According to Pulliam and Van Patten, the Federal Government now aims to fund CTE efforts that aim to “improve economy, keep children in school longer, fight poverty, and create new jobs for the unemployed” (Pulliam & Van Patten, 2007 p. 215). The current legislation efforts that provide CTE regular funding include the Carl D. Perkins Vocational and Applied Technology Education Act and Amendments of 1998, and the Assistive Technology Act of 1998. These acts were created with the particular aims of economic growth, at-risk student success, and assisting students with disabilities develop skills for employability (Pulliam & Van Patten, 2007).

In the early 1900s, the landscape of America represented a largely agrarian workforce. American education, and more specifically Career and Technical Education mirrored that look, providing instruction in the staples of education: reading, writing, and arithmetic. These programs were supplemented with private training for clergy and politicians as well as a few limited basic programs in basic

manufacturing and agriculture (Ausman, 2009). A limited number of practical nursing programs became available following the Smith-Hughes Act of 1917. This was made possible because the Act itself defined practical nursing as a program that fell under the broad umbrella of vocational or trades education (Gordon, 2008).

It was not until 1956, however, that practical nursing was included as a part of the federal vocational education program. Even as an official listed program, it was not until the late 1980's when we began to view health science career and technical education programs begin to take shape in secondary school programs and in community and junior colleges. Prior to this time programs were typically conducted at a hospital or medical center (Gordon, 2008).

As the program has evolved into the schools, the partnership between the health systems and educational facilities has never been greater, and most of the cooperation has been done with the idea that training staff members will allow the healthcare system to gain a qualified workforce ready for employment immediately after they complete their program. According to the United States Department of Labor, this partnership is coming at a critical time. Out of the top 18 occupations expected to grow the fastest by 2014, 13 of those occupations fall under the Health Science Career Cluster developed by the United States Department of Education (*Occupational Outlook Handbook*, 2006).

Career and Technical Education Today

With the expansion of Career and Technical Education in the United States over the past two decades, there have also been educational reforms that have, in some cases, inhibited the growth of programs in CTE. The Carl Perkins Career and

Technical Education Improvement Act of 2006 focused on increased funding, particularly for small states, but also included increased accountability (Gordon, 2008). Recent guidelines have put forth measures to determine levels of secondary and postsecondary achievement and hold institutions accountable for not meeting expectations. In addition, the act made sure to include indicators at the secondary level that included academic achievement based on No Child Left Behind Act of 2001 indicators of academic performance.

On the technical side, secondary indicators for academic success included industry standards whenever possible (Gordon, 2008). The increased funding on a local level has been created to strengthen technical skills of students through integration and provide experiences in all aspects of an industry (Gordon, 2008). In addition to integration of curriculum and a broad program of study, the Perkins Act also sought to improve, expand, and modernize CTE programs. The funding provided for modernization of current CTE programs has been given to provide activities to prepare special populations and mainstream populations for high-skill, high-wage, and high-demand occupations that lead to self-sufficiency (Gordon, 2008).

While schools are aiming to integrate and modernize their CTE programs to prepare students for these occupations, industry has helped shape their mission. Employees have been willing to pay higher salaries for higher levels of skills and certifications in the nonprofessional workforce (Ausman, 2009). Some schools and programs have recognized this and have reached out to industry to match the needs of their students' success and the needs of industry. Programs such as *High Schools*

That Work have sought to increase students' readiness for college and better prepare their students who would be seeking immediate employment (Gibbs, 2006). These programs help meet the needs of industry, while also matching the rigorous ambitions of current legislation for schools under *No Child Left Behind* (Gibbs, 2006).

In the PBS documentary "Making Schools Work," Joyce Phillips, principal of Corbin High School in Kentucky, shared that nearly 80% of all high school students need a 'hook' - something that makes them want to come to school and have a desire to learn. She believed that programs integrating high academic standards and rigor, as well as a comprehensive program for Career and Technical Education focusing on certification and skill development, are the answer to hooking those 80% of teens (Gibbs, 2006).

The integration of skills-based technical education with academic rigor in the traditional curriculum such as reading, writing, math, and science can give these students an opportunity in a variety of arenas following completion of high school. Hiring trainable employees is becoming increasingly difficult because most students seeking employment have little work history, limited educational credentials, and a very brief résumé (Ausman, 2008). Experts believed that in 2010 over 80% of jobs would require students to have additional training beyond a high school diploma (Ausman, 2008). Current programs and curriculum in Career and Technical Education are cognizant of this alarming statistic and the need to provide students with skills and training in industry in addition to academic preparation for college and beyond (Ausman, 2008).

Despite Career and Technical Education of the past being thought of as a track for students who were not going to need the academic rigor and demands of the college preparatory curriculum, research has proven that CTE engages and motivates students by giving them real world opportunities and challenges that will enhance and provide connection to their education (Harris & Wakelyn, 2007). Recently, employers have communicated with educators to tell schools what skills are needed, and these collaborative efforts often include the academic rigor necessary to prepare for schooling beyond high school (Ausman, 2008). It is now estimated that over half of all of all students choosing to participate in some CTE curriculum at their school are taking the bulk of their courses within the college preparatory curriculum (Harris & Wakelyn, 2007).

The efforts of schools to restructure curriculum and increase rigor come in the wake of high drop-out rates and stagnant college completion rates over the past several years (Harris & Wakelyn, 2007). Entrepreneurial philanthropists such as Bill Gates have been challenging public schools over the past decade to include more relevant experiences and real-world practical application to their curriculum, which some find obsolete. At a 2005 conference, Mr. Gates stated that nearly 70% of all students who dropped out of high school claim that they would have stayed more engaged and not dropped out if the school offered more engaging, real world learning opportunities (Harris & Wakelyn, 2007). This call to action was just what Career and Technical Education programs across the country needed to hear because of their ability to give students the opportunity to learn in applied settings (Harris & Wakelyn, 2007).

Impact of Current High-Stakes Testing on Industry-Based Education

While it has been well known throughout industry that applied education at the high school level will aid in the development in the workforce of tomorrow, recent legislation and push from government to ensure academic achievement for all students has spawned a myriad of assessments and high-stakes testing for accountability under these measures (Ananda, 2002). This push has been a concern for Career and Technical Education leaders because of the lack of time for students to participate in CTE coursework with the pressure being placed on student success on norm-referenced tests and accountability under the law for schools and school district to succeed (Gordon, 2008).

As educators, Career and Technical Education teachers know the value of teaching with a focus on academic values, but they also know the importance of industry values and are now, more than ever, attempting to meet the needs of both by blending their curriculum and expanding their focus areas in Career and Technical Education (Ananda, 2002). Among primary concern for vocational educators is not simply that there is little room for students to take courses in CTE, but that high-stakes testing is not meeting the desires of industry because it focuses too much on selected response questioning and not enough on critical thinking, one of the desires of industry officials and a critical component to 21st century industry standards (Ananda, 2002).

Building on the concept of academic standards integrating with industry standards, many schools have gone a step further by creating courses in technical education where a student can receive academic credit (Gibbs, 2006). Examples of

this fusion of these course types include schools permitting splitting Computer-Aided Drafting credit between CTE or elective credit and geometry and introductory health science courses splitting credit between CTE elective credit and health education or science credit (Gibbs, 2006).

While the concept seems unique and practical, decisions regarding these concepts still revolve around school district performance on state testing and accountability of these test scores under No Child Left Behind (Gibbs, 2006). What is clear, however, is that the United States Department of Education still believed that Career and Technical Education should be a viable tool for enhancing the efforts and aspirations of the No Child Left Behind Act of 2001 (Lewis, 2004). According to Hans Meeder, deputy assistant secretary of the Office of Vocational and Adult Education, Career and Technical Education should serve side by side with No Child Left Behind because we need to remain competitive in a global economy with constantly changing dynamics in the workplace, but also remain focused on the future of students by providing a strong academic foundation (Lewis, 2004).

While it appears that most school officials and policymakers support and encourage the development of Career and Technical Education in an era of education that is focused on increasing the academic rigor and enabling all students to take courses in preparation for postsecondary education, the high stakes environment that this policy creates dissuades districts from placing too much value on Career and Technical Education (Fletcher, 2006). Because school districts feel the pressure to perform because those students and schools who do not meet the requirements may encounter severe consequences, it is very easy for schools to neglect curricular areas

that are not tested by the government under No Child Left Behind (Fletcher, 2006).

This creates an emphasis on core curriculum that is tested and tends to neglect the curricular areas and leave them behind in comparison to other curricular areas.

Among those areas affected is Career and Technical Education (Fletcher, 2006).

Many schools are now implementing curriculum and graduation requirements that meet the standards of 'rigorous' according to a number of college-preparatory institutions such as *High Schools that Work* and *ACT* (Campbell, 2010). There have been some educators, however, who have believed that merely increasing the demands placed on students for graduation requirements and overall rigor within the coursework are not the only factors that are relevant when discussing student success in college (Campbell, 2010). Social support and academic support are often referred to as *rigor roadblocks*, and often stand in the way of student success (2010).

The Pathways to College Network in 2007 indicated that nearly one-fifth of high school graduates who were viewed as academically fit for college and come from low income backgrounds did not enter or enroll in college following high school (Bragg & Ruud, 2007). This lack of social support must be rectified because it is critical in developing and sustaining academic models that not only develop and bolster the rigor of current programs, but raise expectations and increase the rate of students whom are underserved attending college (2007).

One of the most significant methods of developing social support and links to academic success in college is to promote career information programs in secondary schools for all students (2007). Providing students with information early, along with opportunities to explore a variety of career pathways, is a means to develop social

support. Research has suggested that specific career pathways pipeline programs in the health sciences for students who are underserved and low-income helps promote college success in the science careers and distinguish these students academically (Winkleby, Ned, Ahn, Koehler & Kennedy, 2009).

Additionally, ACT issue briefs indicate that well-defined career plans influence a person who is currently enrolled in college to stay in college, even when struggling academically (2009). Career programs that give students the opportunity to see adults coming into the classrooms and volunteering their time to provide students valuable career exploration opportunities might be the most valuable and important influence students will have when selecting a course of action after high school (C. Lewis, 2007).

Research has shown that quality academic programs and success in high school programs predicts a future success in college, but there are other factors that contribute to success as well (ACT, 2009). Setting long-term career goals contributes to success in college and the transition to college programs (2009). In addition, research has shown that the lack of a career-related goal(s) or uncertainty about career goals contributes to poor academic performance for students transitioning into college or persisting in college (2009).

Determinants of Successful CTE Programs

Pathways to success in secondary schools typically begin with increasing academic standards and ensuring that all students can achieve them. Where school officials experience frustration has been in not providing professional development and tools to make sure that teachers and students can achieve these goals (Pardini,

2007). The keys to developing successful Career and Technical Education, according to *High Schools That Work*, is to provide similar staff development focusing on instructional practices that apply academic content and skills to real-world problems (2007).

Staff development for Career and Technical Education can vary from instructing educators to teach in a manner that promotes project-based or cooperative learning to developing programs that give more students a way to focus their studies on relevant curriculum for their future. Programs such as computer science, communications and health science career programs are just a few of the relevant programs that can be developed through this staff development (2007).

Research has also shown that CTE programs, which are co-curricular rather than extra-curricular, can provide success for students outside of the standard school day as well by providing student organizations and clubs that focus on curriculum in a different light (Alfeld, Hansen, Aragon, & Stone, 2006). Career and Technical Education Student Organizations (CTSO) help students develop employability skills academic engagement, motivation, and self-efficacy through participating in leadership development activities and conferences that raise students' educational aspirations (Alfed et al., 2006). These clubs create an excellent source of educational outreach for your classrooms by creating confidence, knowledge, and technical skills that will help create the type of leaders in industry that we need to provide for our future (Reese, 2011).

In addition to student organizations providing relevance, classroom instruction should provide a foundation for leadership, critical thinking, problem solving, and

teamwork (Carter, 2010). One way to develop these skills that are deemed critical for the 21st century and to re-capture the love of learning in high school students is through project-based learning (Carter, 2010). Project-based learning is a potentially powerful way to develop rigorous and relevant coursework for our students (Harada, Kirio & Yamamoto, 2009).

Harada et al. (2009) found that project-based learning delivers an education that engages high students with a deeper level of comprehension and interpretation of learning can be synergized more efficiently. In subject areas such as mathematics, Stone and Pearson (2008) found that students with CTE project-based mathematics lessons in high school performed significantly better than control students on two standardized tests of math ability after just one year of CTE project enhanced math instruction. In addition to enhancing learning in core curricular areas, a project-based learning approach has been proven to increase overall satisfaction in school and can improve attendance in typical high school settings (Carter, 2010).

According to Drage (2010), what sets CTE approaches to learning apart from others are that they focus on application-based learning and create in-depth learning to solve problems. Application-based learning, often referred to as investigative learning, assists in teaching the soft-skills such as critical thinking, communication, and teamwork, but modern-day CTE needs to take learning a step further (Drage, 2010). The use of projects can help to promote the teaching of these soft skills, bringing the curriculum in line with the way the world works (Harada et al., 2010). The challenge, however, now rests in the actual content of the projects which are developed and assigned (Drage, 2010).

According to the National School-to-Work opportunities office (1996), project-based learning needs to focus on integrating curriculum with on-the-job that address true, realistic, and practical work-relevant problems. In addition, there should be added approaches to curriculum integration in Career and Technical Education to include thematic and coordinated curriculum (1996). Lynn (2005) found that students in a Massachusetts study, which focused on these three approaches to learning, developed technical and academic skills that assisted the students in improving and contributing to their community. By applying these approaches to community projects designed to help students learn academic and technical skills, the students felt empowered because their projects also contributed to their community (Lynn, 2005).

In addition to projects based-learning, technical skills, and curriculum design, a successful CTE program needs to provide exposure to areas of interest and confidence in gaining skills related to a specific career (McCharen, 2008). According to Gentry, Peters, & Mann (2007), both talented and general students comment favorably on some particular themes within their CTE experiences in high school. Most notably was sharing classes with students who have similar interests in learning about career areas and relevant information in an applied setting.

Peckham (2007) affirmed many of these concepts for developing effective CTE programs. The need to support guidance and career development to help students map pathways to postsecondary programs and career goals and to integrate academic and technical education to better prepare and engage students are just a few of the recommendations made by the Association for Career and Technical Education

regarding aligning NCLB legislation with Perkins legislation (Peckham, 2007). The development of these programs under these guidelines came at a critical time in education (Kotamraju, 2007). With the creation and support of NCLB legislation, the focus on targeting college readiness through increasing academic requirements in math science and language arts has neglected some of the relevant and engaging skills attainable in CTE courses (2007).

In the 1980's, the uproar over the publication *A Nation At Risk* spawned many in career and technical education to rethink their delivery and approach to instruction in vocational and technical education (Elliot, 2007). Support for traditional technical programs in secondary schools was waning, and the need for improved instruction and a focus on graduates within CTE programs moving toward continuing education soon developed (Elliot). In order to prepare for such a change, many states and school districts chose to redevelop curriculum and support teachers of CTE through workshops and increased training. Today, there is little doubt that without the support of Career and Technical Education programs from the Department of Education and respective school districts it becomes very difficult to be successful in delivering quality CTE programs (Elliot).

Health Science Programs in Career and Technical Education Today

Career and Technical Education is designed to provide students with the technical skills, knowledge, and training necessary to succeed in specific occupations and careers. It is also designed to prepare students for the world of work by introducing them to the workplace. Finally, it is designed to take academic content and make it more accessible to students by providing it in a hands-on learning context

(National Association of State Directors of Career and Technical Education Consortium, 2003). Health science programs, under the guidance of modern Career and Technical Education, seeks to advance health-occupations education and its capability to equip students with skills, knowledge, and training for life and career success (Gordon, 2008).

Relatively new in Career and Technical Education, CTE programs for health occupations have evolved from only practical nursing programs being offered decades ago to the myriad of programs that are currently being offered today (Blassingame, 2000). The variety of programs in health occupations today have allowed students to find their niche in a particular area of health care or allied health—any field of health care outside of physician and nurse (Blassingame). Because of the variety of programs and concentration areas within health occupations career and technical education, many students who graduated from a secondary setting have gone on to pursue post-secondary education in their chosen field (Blassingame).

Examples of success in secondary health science programs bridging a gap between the labor demands of the industry and the need for CTE to develop programs with relevance and integration of academic skills can be seen all over the United States (Lynch, 2000). An example of such successful program development can be seen in Dearborn, Michigan, where the Henry Ford Health System was facing a critical problem with their allied health workforce aging and not enough labor pool to replace it (Samuels, 2011). The Health System partnered with the local community college and 18,000 student school district to create the Henry Ford Early College,

where a student can earn a high school diploma, technologist degree, and on-the-job training, and a leg up in the local health industry while attending high school (Samuels).

These programs not only helped to entice people to enroll in health science programs following high school, they actually merged the secondary experience and post-secondary experience together to ensure a successful transition (2011). Lynch (2000) indicated in his brief on 21st century Career and Technical Education that post-secondary education needs to be on the radar of all high school students, not just those in college preparatory track. Further, he stated that a K-14 approach to education for Career and Technical Education students would need to be prepared to exit high school with the skills and education necessary to continue in some form of formal postsecondary education (Lynch). In addition, he cited economic forecasts predicting the need for all individuals to continue to develop their education over their lifetime and the need for course articulation to assist the student into postsecondary learning as vital to successful 21st century CTE programs at the secondary level. Currently, the prognostications of Lynch have held up, as many reports as recent as 2010 have suggested that individuals currently engaged in their careers seem very much willing to continue their education in their current career path, although higher education institutions are not always the most desirable pathways to continuing their career education (Crossouard & Aynsley, 2010).

Experience and opportunity to see firsthand a variety of different career paths has been critical to student success in health programs (Lynch, 2000). Health Science programs have targeted students with a variety of different methods that have been

critical to gaining insight into a variety of career paths, as well as problem-based relevant curriculum and contextualized learning (Haney, 2007). Not only does contextualized learning assist the student with relevant coursework toward their interested career path, but health science educators can gain affirmation of teaching strategies in the areas of Allied Health, when these programs develop curriculum based on relevant, problem-based approaches to learning (Haney, 2007).

The use of integrated academic and CTE curriculum, particularly in health science CTE programs, is a trend that many programs will emulate (McCharren, 2008). According to Packard, Gagnon, and Moring-Parris (2010), linking academics to work-based opportunities in the Health Sciences can help students see academics as important to their Career and Technical Education worlds and career interests. While health science has been utilizing the integration of academics into CTE principle as much as any current Career and Technical Education program, the study by Packard, Gagnon, and Moring-Parris (2010) also found that there are challenges to integrating higher-level science curriculum into health science career and technical education courses. Primarily, the problems existed with teaching and learning styles and variety of levels of prior science knowledge in the Career and Technical Education (Packard et al., 2010). The study did point out that efforts to blend the two programs are currently being attempted nationally and that we will need to continue to pursue this integration in order to ensure our nation stays competitive and our students can maximize their opportunities in Health Science Career and Technical Education (Packard et al.).

Self-Efficacy of Secondary Career and Technical Education Students

Self-efficacy is a person's belief in his/her competency to perform well. Self-efficacy for finding and pursuing a career pathway has been something that career and technical educators have valued and desired students to achieve in their programs (ACTE, 2006). It is believed that strong self-efficacy can be developed through four main sources of influence. The first and often most referred source of influence is through mastery of challenging tasks (Bandura, 1994). The second source is through vicarious experience with those of social influence. Seeing somebody similar to themselves succeed also allows for a strong sense of capability (Bandura, 1994). The third and fourth sources, social persuasion and psychological responses, suggest that our own emotional responses to situations give us a sense of confidence or lack of confidence in a discipline or influence (Bandura, 1994). Some barriers that are currently preventing students from making a successful transition from high school to postsecondary programs in the 21st century have been self doubt and low expectations, according to George W. Bush, when he enacted the No Child Left Behind Act of 2001 (Fletcher, 2005).

While Career and Technical Education and specifically Health Science CTE programs aim to give students a leg-up in the workforce through quality instruction, it is also designed to give the students the confidence that they need to be successful in the workforce (Reese, 2010). Self-efficacy and motivation, the inverse of self-doubt and low expectations that were described by President Bush are viewed as key components to student success in secondary programs and determinants of future success in postsecondary programs (Dykeman, Wood, Ingman, & Herr, 2003).

Research has suggested that Career and Technical Education works in motivating students to stay in school and helps reduce the dropout rate (Alfed, Hansen, Aragon, & Stone, 2006). While motivation to complete current secondary programs has been a benefit to students and to society, people need to pursue the goal of student success in post-secondary education as well in order to remain viable to the nation and to students in the 21st century (Packard et al., 2010). This pursuit will also match current Career and Technical Education Perkins Act goals with No Child Left Behind benchmarks, that has been the mission over the past decade (McCharren, 2006).

Current health science programs and student organizations have established curriculum to help develop self-efficacy for students. Perceived self-efficacy develops individual beliefs about the students' ability to perform certain tasks (Bandura, 1998). In addition, a strong sense of efficacy allows individuals to approach difficult tasks and challenges with confidence and an ability to master them, rather than succumb to them (Bandura, 1998). Longitudinal studies have suggested that the motivation and self-efficacy levels for students in general high school programs declines slowly over time and that Career and Technical Education and CTE student organizations actually help slow or eliminate that decline in motivation and self-efficacy (Alfed et al., 2006).

While it is apparent in certain studies that CTE courses assist in developing self-efficacy in regard to secondary school career experiences and career goals, there remains doubt that secondary CTE courses alone can benefit student academic-efficacy in the postsecondary setting (Packard et al., 2010). Integration and infusion

into the academic curriculum, rather than a stand-alone CTE program, however, should assist in maintaining motivation, developing skills and increasing academic self-efficacy for postsecondary learning (Ananda, 2002).

Summary

Career and Technical Education, previously referred to as Vocational or Trades Education, has been evolving since the Smith-Hughes Act of 1917 (Gordon, 2008). The original intent of early legislation in vocational education was to provide the United States with a skilled workforce that reached out to a larger audience or student base (Pulliam & Van Patten, 2007). More recent legislation has been developed to protect the interests of competing as a global power on the workforce and education front. The Carl D. Perkins Vocational and Applied Technology Education Act and Amendments of 1998 and the Assistive Technology Act of 1998 were created with the particular aims of economic growth, at-risk student success, and assisting students with disabilities develop skills for employability (Pulliam & Van Patten, 2007).

While schools have aimed to integrate and modernize their CTE programs to prepare students for these occupations, industry has helped shape the mission of these school programs. Employees have become more willing to pay higher salaries for higher levels of skills and certifications in the nonprofessional workforce (Ausman, 2009). Recent studies have suggested that CTE is gaining momentum as a viable and beneficial program of study for all students in secondary education programs (Bernardino & Seaman, 2011).

Roadblocks do exist in the path of broadening the scope of Career and Technical Education and accomplishing its mission (Fletcher, 2006). Recent legislation in the form of the No Child Left Behind Act of 2001 has caused a push from government to ensure academic achievement for all students and forced schools to deliver a variety of assessments and high-stakes testing for accountability under these measures (Ananda, 2002). This push is a concern for Career and Technical Education because of the lack of time for students to participate in CTE coursework with the pressure being placed on student success on norm-referenced tests and accountability under the law for schools and school district to succeed (Gordon, 2008).

With limited time and a current belief that Perkins legislation funds would be better served providing remediation in academic core courses (Fletcher, 2006), Career and Technical Education will need to link arms and share the mission of No Child Left Behind and integrate and infuse CTE principles and programs with academic core courses. The desire of students to graduate, but also pursue and succeed in postsecondary education is the mission of our current educational system, industry leaders, and our nation. Experts believe that in 2010 over 80% of jobs will require students to have additional training that goes beyond a high school diploma (Ausman, 2008).

Health science programs, along with other Career and Technical Education programs, focus on application-based learning and create in-depth learning to solve problems. Application-based learning, often referred to as investigative learning, assists in teaching the soft-skills such as critical thinking, communication, and

teamwork but modern-day CTE needs to take learning a step further (Drage, 2010). Studies have shown that application-based learning and project-enhanced programs infuse relevance into the curriculum and spark motivation in students who are not engaged. Student motivation is viewed as a crucial component to academic success and post-secondary interest (Alfeld et al., 2006). While many of these application-based learning and practical programs assist in developing self-efficacy in finding and pursuing a career pathway (ACTE, 2006), more study is needed to determine whether or not they develop the academic efficacy needed for post-secondary success.

CHAPTER 3

Methodology

This chapter describes the population, the research design, the study survey instrument, the procedures for collection of the data, the research questions, and the methods of data analysis that were used in the study.

Review of Related Literature

Examination of the topic and related literature to enhance and substantiate research was conducted with the use of *Educational Resources Information Center (ERIC)*, *Education Research Complete*, *Education Full Text (within Wilson OmniFile)*, *Online Texts Collection*, *Complete Dissertations via ProQuest*. *The Publication Manual of the American Psychological Association* (6th ed., 2009) was used for writing style. The literature selected was designed to give background into Career and Technical Education, its relevancy in current educational models, and to give an understanding of what is the current mission of Career and Technical Education in the United States.

The literature was also selected to gain insight into current workforce demands and industry standards that have been desired from the current health sciences labor force. Finally, the selected literature was chosen to identify studies that have previously researched effectiveness of programs related to their mission statements. All of the literature was located and retrieved using the Research Gateway via the I.D. Weeks Library located on the campus of the University of South Dakota, Vermillion.

Purpose of the Study

The purpose of this study was to identify current academic and/or career pursuits and perceptions of students following completion of the program in secondary school. The purpose was to determine the overall effectiveness and identify strategies and curriculum that were effective at reaching the overall mission of Career and Technical Education within a local school district and pilot school. The program to be studied began at the school and courses were developed by instructors at the school. The subjects of study were all graduates of the school and school district who designed the program that was evaluated. Graduates who participated in the program were surveyed and examined. Demographic, scholastic, and current employment/college enrollment data as well as perceptions of the program were collected.

Research Questions

The following research questions guided the study:

1. To what extent did graduates of the health science program pursue enrollment in a post-secondary health science program?
2. What are the perceptions of these graduates regarding the extent to which participating in the District Health Sciences CTE course led to completion of a post-secondary health science program?
3. What are the perceptions of these graduates regarding the extent to which participation in a District Health Sciences CTE course developed skills that are helpful in transitioning into workforce jobs related to health science after high school?

4. What is the relationship between number of courses taken in the Health Sciences Program and likelihood of enrollment in a health sciences program following graduation?
5. What are the perceptions of these graduates regarding the extent to which specific skills/learning opportunities that are taught within the high school health science curriculum were important to students in post-secondary programs?
6. To what extent do the perceptions of students regarding their post-secondary experiences following participation in the high school program differ based on gender of the student?
7. To what extent do the perceptions of students regarding their post-secondary experiences following participation in the high school program differ based on what year the students graduated from high school?

Population

The study utilized survey data collected from high school graduates from four successive years in at North Star High School in Lincoln, Nebraska. These students were selected on the basis of enrollment and completion of at least one of the courses that are offered in the program of the pilot high school from the graduation years of 2008 to 2011. The pilot school was selected based on the offering of all of the programs courses for the longest period of time 2005-2011.

The population for this study were students who have graduated from the pilot high school between 2008 and 2011 and have participated in the health sciences program by completing at least one of the selected courses within the program. The

entire population of the overall students graduating from the programs each of these years (2008-2011) were studied. Because the curriculum and district mission encompass all of the courses taught uniformly at the school each year and the number of students taking a course in the program is low (119), all of the students who qualify as subjects were studied.

The current program that is operating in the Lincoln Public Schools and at North Star High School in Lincoln, Nebraska, has included several courses, internship opportunities, a Health Occupations Students of America club, and a health science summer camp for students at a local hospital. The program is enriched through a variety of hands on learning experiences, field trips, and career discovery days.

Courses that have been taught in the program include Medical Terminology, Introduction to Health Occupations/Careers, Fundamentals of Health Careers/Basic Nurses Assistant, and Anatomy and Physiology. The coursework has differentiated curriculum (Anatomy and Physiology) and dual credit/articulated credit options (Medical Terminology, Fundamentals of Health Careers).

Each school year, six students are selected for paid summer internships in a medical specialty field at a local hospital. Selection is based on application to the program, junior status, attendance, and grades. The internships are provided by the hospital and include required research, assistance in their respective field, and active learning opportunities with the physician, nurse, or respective health care professional.

In addition to the internship, students are also encouraged to attend the summer medical camp where they are allowed to complete a week of full hospital

rotations in a variety of health care settings and professions. As many as 12 students are selected for camp participation. The camp provides the students to explore a variety of career pathways and ensures that they are gaining valuable and applicable experience in the profession outside of the classroom.

The program also includes an active student organization that is a nationally recognized club. *Health Occupations Students of America* or HOSA is a national academic club that focuses on students interested in health care. The local chapter provides the students opportunities outside the classroom that include competitions at the state and national level, guest speakers, community service, and assistance with a non-profit national health awareness campaign.

Instrumentation

The instrument (Appendix A) was designed by the researcher to include basic background information (demographics, school, employer, age, and gender) as well as questions related to the specific research questions that were to be examined. The survey was conducted with a Likert-type scale for the population to record their responses. In addition to the scale data, the instrument also included one open response question. The data collection instrument served as a guide for the data collection process. The survey served as a compilation of information taken from the survey questions as well as provided background information regarding the subjects that were surveyed. Because the instrument was created by the researcher, the instrument was critiqued by school district officials including the principal of the high school where subjects graduated and a curriculum instructor from the district to be studied. In addition, a survey justification matrix (Appendix B) was developed to

justify questioning in the survey instrument. Because these officials had an understanding of the project, were leaders in the district being studied, and were well-versed in data collection for students, they were utilized to make recommendations in lieu of pilot testing the data.

Data Collection

The instrument (Appendix C) was designed in December of 2011 and was critiqued by experts in February of 2012. Once examined by doctoral committee members, the instrument was revised and sent to subjects in the sample. The demographic information of students who are eligible for inclusion in the study (population) was obtained from the district. Approval for the study was gained through the district Institutional Review Board as well as the Institutional Review Board at the University of South Dakota.

The instrument was included with a cover letter (See Appendix D), including a description of the study and instructions for the instrument survey. The use of Survey Monkey ® instrument technology was used to collect responses from the subjects. The instrument was electronically mailed individually to each participant and surveys were returned directly to Survey Monkey ® and the researcher. The distribution and electronic mailing of initial instruments were made at the end of February of 2012, with a follow-up to non-respondents approximately two weeks following initial distribution. Data collection was completed on March 12th of 2012.

Data Analysis

The data obtained from the instrument was analyzed with descriptive and inferential statistics. Statistical analysis included frequencies, means, and standard

deviations. In addition, Analysis of Variance (ANOVA) and Pearson's correlation analysis was completed for selected research questions. Each individual research question was addressed using statistical measures to analyze the data. Individually, the research questions were addressed by the following:

Research question one was addressed through means and standard deviations, regarding respondents' perceptions of how much participation in the health science program being researched affirmed their career interests and led to their enrollment in a health science program at a post-secondary institution. The responses were categorized as either responding *strongly disagree*, *disagree*, *neutral/no opinion*, *agree*, or *strongly agree* with a Likert scale of 1 (*Strongly Disagree*) to 5 (*Strongly Agree*) assigned.

Research question two was addressed through means and standard deviations, regarding respondents' perceptions of how much participation in the health science program being researched led to completion of a health science program at a post-secondary institution. Students who had completed a program were asked to respond to three separate questions. The responses were categorized as either responding *strongly disagree*, *disagree*, *neutral/no opinion*, *agree*, or *strongly agree* with a Likert scale of 1 (*Strongly Disagree*) to 5 (*Strongly Agree*) assigned.

Research question three was addressed through means and standard deviations, regarding respondents' perceptions on how much their participation in the health science program provided a variety of different health care industry skills, and whether or not participation in the Health Science Program assisted in developing

skills which were helpful in transition to the health care workforce. Likert-type responses were used to access data necessary for determining research question three.

Research question four was addressed through frequencies and percentages regarding the number of CTE courses taken and current enrollment in a post-secondary education. A correlation analysis was conducted to determine whether there was a relationship (and the strength of the possible relationship) between perceptions regarding the health care program from respondents' taking more Health Science Career and Technical Education courses and their pursuit of a post-secondary course of study in health science.

Research question five was addressed through means and standard deviations regarding activities and skills perceived as most beneficial to students in a current program, and which current skills taught in the secondary health science CTE program were viewed as most important to students in a postsecondary health science program. Means for skills viewed as most important and least important were rank ordered.

Research question six and seven were addressed through frequencies and percentages of responses related to perception of the program. The data was categorized based on gender and graduation year, and descriptive statistics were used to determine whether or not differences in responses existed based on gender or the year that the student graduated from high school. Independent *t* tests were performed to determine whether or not differences in responses existed based on gender. The ANOVA was used to determine whether or not differences existed based on year of graduation. The ANOVA was used to analyze each individual question from the

instrument and in relation to differences from the year of graduation of the respondent. Individual differences would be recognized on an item by item basis and a grade by grade basis.

CHAPTER 4

Results

The purpose of the study was to identify current academic and/or career pursuits and perceptions of success of health care students in the workforce following completion or graduation of secondary school. The study was developed with the goal of determining perceptions of graduates from a pilot high school regarding the overall effectiveness of their health care introduction program and the extent to which courses contributed to reaching the overall mission of Career and Technical Education within the district. In addition, the goals of the study were to address the following questions:

1. To what extent did graduates of the health science program pursue enrollment in a post-secondary health science program?
2. What were the perceptions of these graduates regarding the extent to which participating in the District Health Sciences CTE course led to completion of a post-secondary health science program?
3. What were the perceptions of these graduates regarding the extent to which participation in a District Health Sciences CTE course developed skills that are helpful in transitioning into workforce jobs related to health science after high school?
4. What were the relationship between number of courses taken in the Health Sciences Program and likelihood of enrollment in a health sciences program following graduation?

5. What were the perceptions of these graduates regarding the extent to which specific skills/learning opportunities that are taught within the high school health science curriculum were important to students in post-secondary programs?
6. To what extent did the perceptions of students regarding their post-secondary experiences following participation in the high school program differ based on gender of the student?
7. To what extent did the perceptions of students regarding their post-secondary experiences following participation in the high school program differ based on what year the students graduated from high school?

Demographic Data

A total of 119 surveys were distributed to all eligible graduates of the program who were identified as having taken and completed at least one health science course at North Star High School and who graduated from high school in the graduation years of 2008-2011. Of the 119 surveys distributed, 61 were returned for a response rate of 51.3%. The primary responses were from the initial submission of the electronic survey, with 46 surveys (75.4%) being returned successfully before the first collection date. The remaining 15 surveys (24.6%) were collected during the second follow-up to the primary survey letter.

Of the 61 responses, the valid percentage of return included 48 (78.7%) being females and 12 (19.7%) being males. These percentages are reflective of the population. Table 1 shows the number of respondents based on gender.

Table 1

Frequency Table of Respondents' Gender

Gender	Frequency	Percentage
Male	12	19.7
Female	48	78.7
No Response	1	1.6

The respondents graduated between the years 2008 to 2011 with 14 (23%) students graduating in 2008, 19 (31%) graduating in 2009, 25 (41%) graduating in 2010, and 3 (4.9%) graduating in 2011. Table 2 shows the breakdown of responses based on year graduated from high school.

Table 2

Frequency Table of Respondents' Year Graduated from High School

Graduation year	Frequency	Percentage
2008	0	00.0%
2009	14	23.0%
2010	19	31.1%
2011	26	42.6%

Findings Related to Research Questions

This section presents the data gathered during this study to answer the research questions. All data were gathered according to the protocols identified in Chapter 3.

Graduates who sought to enroll in a health sciences program. Research question one identified the extent to which graduates who participated in the local health science program went on to enroll in a health sciences program after high school. Question 17 from the survey instrument asked subjects to describe the type of health sciences program that they were currently enrolled in or had already completed. The survey results revealed that 29 (47.5%) of subjects who completed and submitted the survey were either currently enrolled in a health sciences program or had already completed a program. Table 3 shows the distribution of subject data regarding health science enrollment or completion. The data showed that individuals who completed the survey had nearly a 50% enrollment rate after completing the program.

Table 3

Summary of Participants' Enrollment or Completion of a Health Sciences Program

Response	Frequency	Percentage
Enrolled or completed (answered question)	29	47.5
Not enrolled or completed (did not respond)	31	52.5

Perceptions regarding program developing college-prep completion of health sciences programs. The second research question identified the perceptions of students on the program and the extent to which participating in the Program influenced their completion of a post-secondary health science program. Question 16 in the survey instrument directly identified the research question when it asked the subjects about the extent to which the knowledge and skills taught in the course or courses taken in health science at LNS gave students confidence to succeed in their health science program and/or career path. Of the 61 respondents who submitted a survey for analysis, 59 responded to this question (96.7%), with ($M = 4.19$, $SD = .819$). The 4.19 score is on a Likert scale with a score of 1 representing the indication that it *did not help with confidence at all* and a 5 representing that it *was extremely helpful with confidence in the field*. The mean score of 4.19 indicated that the average score was between helpful and very helpful, with confidence of success in a health science program or profession. Table 4 shows these findings.

Table 4

Perceptions of Confidence in Health Science Programs after Taking LNS Programs

Variables	<i>M</i>	<i>SD</i>
Skills taught give confidence in current health science program.	4.19	.819
If enrolled, what type of program? 1-Pre Medical, 2 Medical program, 3 Medical Tech. program	1.41	.682

The mean score of 4.19 in response to question 16 regarding the skills and instruction taught within the high school program giving confidence to those students who were currently enrolled in or practicing in a health science program indicated that of the 97% of respondents who answered this question, the average score of question 16 showed that respondents felt as if the skills and programs taught were either *helpful* (4) or *very helpful* (5) for the confidence of these students who were currently in a health science program beyond the high school level. With a midpoint of 2.5-3.5, a mean score of 4.19 ($M = 4.19, SD = .819$) indicated a strong perception of confidence in skills due to the health science program.

Relationship between participation in the program and developing quality work-force skills. Research question 3 addressed the extent to which participation in the health science program at North Star assisted in the development of quality work-force skills. Table 5 lists response means and standard deviations regarding responses to survey questions 7 and 8.

The results displayed in Table 5 indicate that the respondents felt perceived that the skills taught were either *helpful* (4) or *very helpful* (5) ($N = 56, M = 4.43, SD = .912$). The respondents perceived that the skills taught in the program assisted them in their programs.

Table 5 also indicates that the specific certification skills (such as CPR/First Aid and Certification in Nurse Assisting) were helpful to the students in their future career development ($N = 45, M = 4.16, SD = 1.296$).

Table 5

Relationship between Program and Workforce Skills

Variables	<i>M</i>	<i>SD</i>
Skills taught in high school aid in health science program	4.43	.912
Health Science cert. programs assist in health science success after high school	4.16	1.296

The relationship between number of courses taken in Health Sciences program and likelihood of enrollment in a health sciences program following graduation. Research question four determined the strength of relationship, if any, between the number of courses students completed in the Health Science Program and their likely enrollment in a health science program. According to the data collected, 29 (47.5%) respondents took *Intro to Health Occupations* as a course in the Program. A total of 51 respondents (83.6%) took the course *Medical Terminology*. The Basic Nurses Assistant course *Fundamentals of Health Care* had 17 respondents (27.9%) who indicated that they took the course. Finally, 37 (60.7%) of respondents indicated that they completed the Anatomy and Physiology course while in the program. Table 6 displays the frequency data from the respondents on the courses that were taken in the health occupations program.

Table 6

Frequency of Courses Taken in LNS Health Science Program by Respondents

Course	Frequency	Percent
Intro to Health Occupations	29	47.5
Medical Terminology	51	83.6
Fundamentals of Health Care (Basic Nurse Assist)	17	27.9
Anatomy and Physiology	37	60.7

In addition to frequency data collected from respondents regarding courses taken, research question four determined if there was a relationship between the number of courses taken in health sciences and likelihood of success or enrollment in a post-secondary health sciences program following high school. The survey instrument used items 14 and 15 to identify perceived correlations between these two variables. Item number 14 and 15 were part two of the survey instrument and focused on research question four specifically. Item number 14 asked respondents to list how many courses that they had taken in the high school program. Descriptive statistics for item number 14 are listed below in Table 7. Item number 15 asked about the skills used from those courses on a daily basis in respondents' current careers. The students were only to answer section two if they were currently in a health sciences career. The descriptive statistics for item number 15 are listed below in Table 8.

Table 7

Descriptive Data on Number of Courses Taken in High School Health Sciences

Survey Item #	<i>N</i>	<i>M</i>	<i>SD</i>
Respond to the data on number of courses taken.	45	3.44	1.078

Regarding number of courses taken while enrolled in the high school program (Survey item 14), 45 respondents of the 61 total who responded to the survey (74%), more than half had taken more than three courses ($M = 3.44$, $SD = 1.078$). The range of responses could vary from a minimum of one course taken to a maximum of four.

Table 8

Utilization of Skills from High School Coursework in Careers

Survey Item #	<i>N</i>	<i>M</i>	<i>SD</i>
Q 15	42	4.02	.975

The number of respondents who indicated their perception of the extent that they used their high school Health Science Program skills in their current work (Survey item 15) was 42 of the 61 total (68.9%) ($N = 42$, $M = 4.02$, $SD = .975$). The number of respondents was dictated by age, as many respondents were unable to answer the question because they were not currently employed in the health-care

field. The score of 4.02 was based on a Likert scale of 1 to 5, indicating that respondents *often* used skills from the program in their current career field.

Responses related to number of courses taken and value of courses in current work (from survey questions 14 and 15) were analyzed by use of Pearson's correlation coefficient to determine if taking more courses was related to perceptions of more skills being used in health care jobs. The results from the correlation analysis are listed below in Table 9.

Preliminary analyses were performed to ensure no violation of assumptions of normality, linearity, and homoscedasticity. There was a moderately strong correlation between the two variables, $r = .357, n = 42, p < .02$. The coefficient of determination was 12.7%. This indicates that the number of courses taken only helped to explain 12.7% of the variance in respondents' scores on skills taught being utilized in health care careers.

Table 9

Pearson Product-Moment Correlations between Number of Courses Taken and Amount Learned Skills from High School Program Are Utilized in Current Career

<i>N</i>	Item 14 (45)	Item 15 (42)
Item 14 Pearson Correlation Significance (2-tailed)	1	.357 .020
Item 15 Pearson Correlation Significance (2-tailed)	.357 .020	1

Perceptions of respondents regarding importance of specific skills/learning opportunities from the program in post-secondary programs.

The fifth research question identified the perception of respondents regarding the importance of skills learned in the specific high school program was important to respondents in their post-secondary pursuits. Two specific questions within the survey instrument focused on this particular research question. Survey question 13 identified the perception of the extent of importance of taking courses in health science at the high school level gave students a head start in health care, as compared to peers without such background. Specifically, this question assisted in measuring the importance of taking courses in high school to gain an advantage over their peers in post-secondary programs.

Of the 61 individuals who responded to the survey, 57 (93.4%) of the respondents answered question 13 ($M = 4.37, SD = .957$). The responses to item 13 were on a Likert scale with 1 representing the lowest score (*no assistance*) and 5 representing the highest score (*extremely beneficial*).

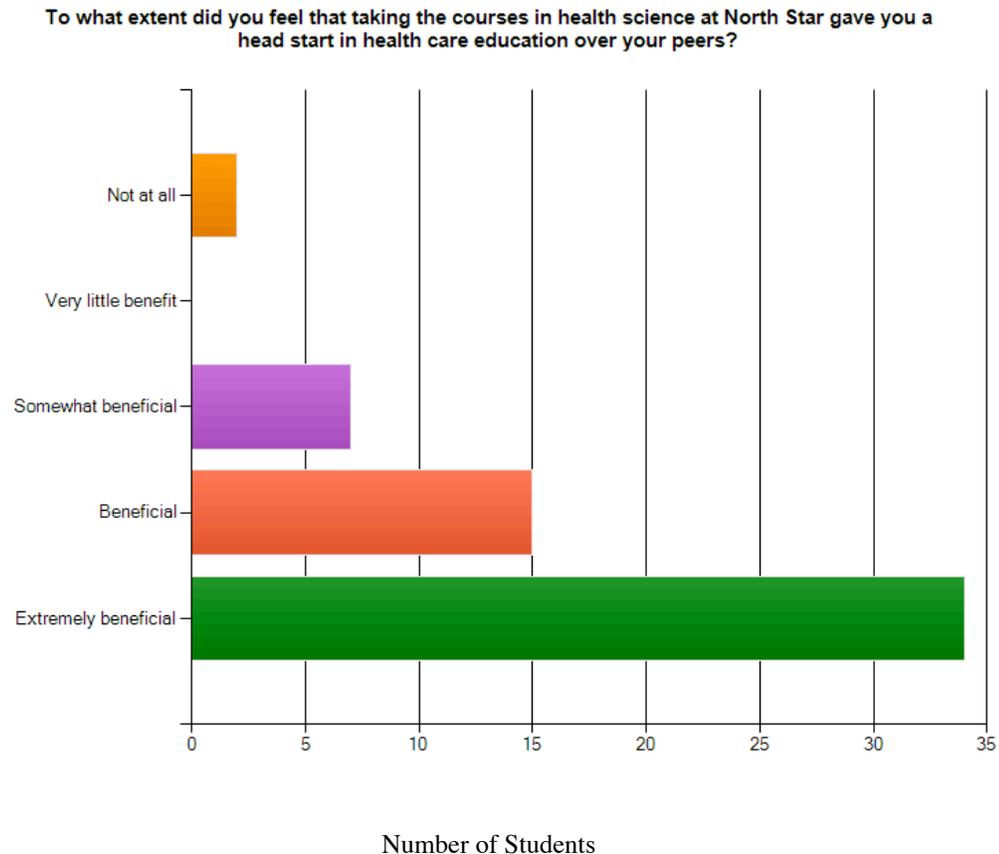


Figure 1 Did North Star Health Sciences Give You a Career Advantage in the Health Science Workforce?

Data regarding respondents' perceptions of the extent to which courses assisted with or gave a head start to students who took the health science courses are presented in Figure 1. Of all of the responses, most of the responses indicated that students ($N = 34$) felt that taking the courses were *extremely beneficial* for them.

The fifth research question focused on perceptions of the opportunities in high school programs assisting respondents in post-secondary programs (survey item 11). Of the 61 individuals who responded to the survey, 57 (93.4%) of the respondents

answered item number 11 in the survey. Of all of the items in the survey, item number 11 contained the highest mean score for all responses ($M= 4.61$, $SD= .559$). The results indicated that all of the respondents at least found some degree of relevance in the subject matter for practical use later on in their post-secondary education. All respondents selected a score of at least 3 on the item analysis, and most identified a score of 4 or 5 in their responses as shown in Figure 2. Figure 2 demonstrates the results of item number 11 and affirms that the majority of students found their experience in health sciences to be important in their ability to perform better in their post-secondary experiences.

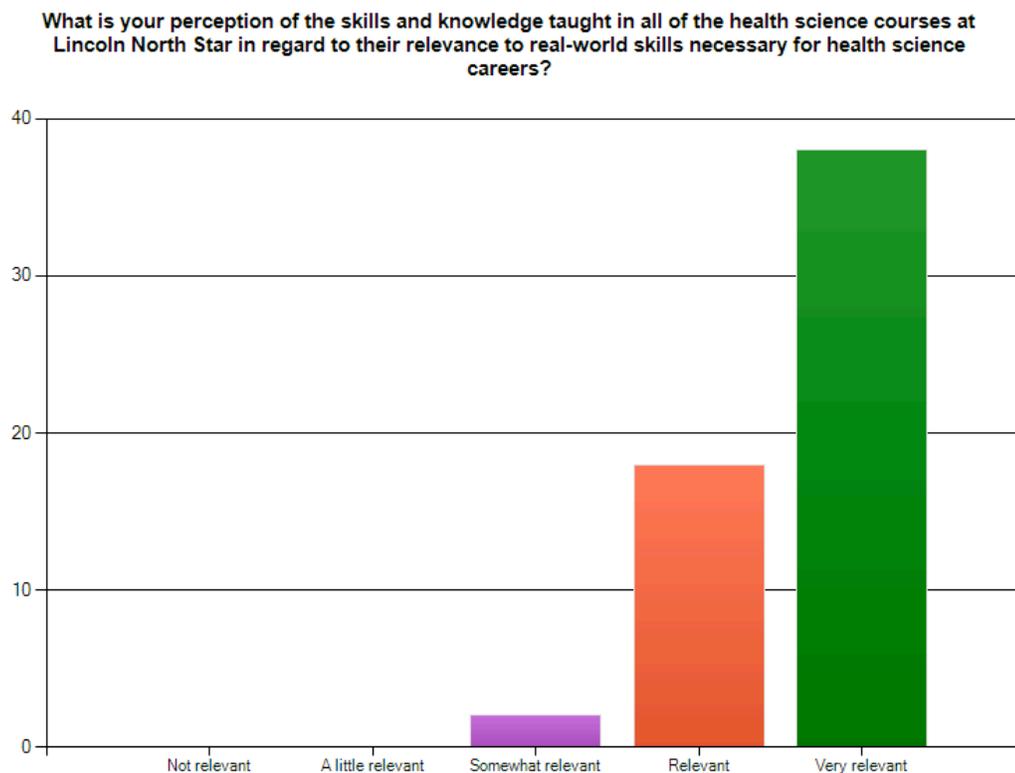


Figure 2. Perceptions of skills regarding relevance in real-world.

Perception of high school health science programs based on gender.

Research question six sought to address potential differences of perception regarding specific components of the health care program being examined as well as overall gender differences in perception of the program. Of the 61 responses, 48 (78.7%) were female and 12 (19.7%) were male. One (1.6%) did not respond to the question regarding gender. Due to the high number of female responses and the limited ability to extend the potential pool of respondents, gender differences were very difficult to detect. A *t* test was performed in order to determine whether or not significant gender differences existed in each relevant item of the survey instrument. Results of the *t* test for independent samples indicated a significant difference in mean scores in item number 9 for the boys ($M = 3.20$) and girls ($M = 4.21$), $t(50) = -2.215$, $p = .031$.

Because Levene's test indicated a sig. value larger than .05 for items 2, 3, and 9, equal variances were assumed. In all items that were analyzed, items 2, 3, and 9 were the only instrument items in which a significant difference was apparent regardless of assumption of equal variances. Items 2 and 3 asked about medical terminology and health occs classes helping with the program. Question 9 on the survey asked the extent to which having Medical Terminology and Nurses Assisting as courses where students could gain community college credit was assessed and considered helpful.

Of the respondents who answered item 9 (52 respondents), 10 of them were male (19.2%), and 42 were female (80.8%). As previously stated, the mean score for the boys was significantly lower than for the girls regarding their belief that these

courses being offered as articulated credit with the community college was helpful.

Table 11 below lists the independent samples test for all instrument items that were relevant to research question six.

Table 10

Summary of Gender Differences on Survey Items

Item Number	<i>t</i>	<i>df</i>	<i>p</i>
Question 2 <i>Intro to Health Occupations</i> , to what extent did the course assist you in preparing you	-4.376	24	.000
Question 3 <i>Medical Terminology</i> , to what extent did the course assist you in preparing you for success	-2.822	39	.007
Question 4 <i>Fundamentals of Health/CNA</i> , to what extent did the course assist you in preparing you	.669	47	.507
Question 5 <i>Anatomy and Physiology</i> , to what extent did the course assist you in preparing you	-.508	34	.615
Question 6 internships and summer camp opportunities in the program help you	-.885	51	.380
Question 7 learning specific skills and vital signs assessments help you	-1.643	42	.108
Question 8 CPR/First Aid certification and licensure and certification as a Nurses Assistant help you	-.763	54	.449
Question 9 articulated credit through a community college in	-2.215	50	.031

the Medical Terminology course assist you

Question 10 advanced placement curriculum in Anatomy and Physiology course assist you	-1.571	39	.124
Question 11 skills and knowledge taught in all of the health science courses at Lincoln North Star in regard to their relevance to real-world skills	.745	55	.460
Question 12 courses in health science at Lincoln North Star assist you in affirming your career interests	.028	56	.977

Perception of high school health science programs based on year

graduated. The final research question (question 7) asked the extent that perceptions of students regarding their post-secondary experiences following participation in the high school program differed based on what year the students graduated from high school. In order to determine whether or not there was significant variation between years of graduation, an analysis of variance was performed on each item in the survey instrument. Results of the one-way analysis of variance for each item did not reveal any significant difference in responses based on year graduated in any of the items in the survey. A one-way ANOVA between groups was conducted to assess the comparative data across each of the four graduation classes. Participants were divided into four classes of graduation based on survey data collection. Group 1 (Graduation year 2008) did not have any respondents and therefore was not included in the analysis of variance. Since they were not included, the groups were then reduced to three groups. The groups were referred to as groups 2, 3, 4 (Group 2:

2009 graduates; Group 3: 2010 graduates; Group 4: 2011 graduates). In the analysis, there were no significant differences between groups ($p > .05$) for any of the items that were analyzed. There was no difference in mean scores between the groups. Table 11 gives distribution of ANOVA results for each item in the survey that was analyzed to determine significant difference based on year of graduation.

Table 11

Differences Based on Year of Graduation

Item number (Between)	Sum of Squares	<i>df</i>	Mean Square	<i>F</i>	<i>p</i>
Q2 (<i>Intro to Health Occupations</i> , to what extent did the course assist you in preparing you)	32.154	2	1.287	.988	.388
Q3 (<i>Medical Terminology</i> , to what extent did the course assist you in preparing you for success)	1.812	2	.906	.819	.449
Q4 (<i>Fundamentals of Health/CNA</i> , to what extent did the course assist you in preparing you)	1.013	2	.506	.743	.481
Q5 (<i>Anatomy and Physiology</i> , to what extent did the course assist you in preparing you)	.821	2	.411	.226	.799
Q6 (Internships and summer camp opportunities in the program help you)	8.323	2	4.161	2.455	.097
Q7 (Learning specific skills and vital signs assessments help you)	1.149	2	.575	.693	.505
Q8 (CPR/First Aid certification and licensure and certification as a Nurses Assistant help you)	1.808	2	.904	.516	.601
Q9 (Articulated credit through a community college in the Medical Terminology course assist you)	2.380	2	1.190	.630	.537

Q10 (Advanced placement curriculum in Anatomy and Physiology course assist you)	6.448	2	3.224	2.244	.120
Q11 (skills and knowledge taught in all of the health science courses at Lincoln North Star in regard to their relevance to real-world skills)	.719	2	.359	1.167	.319
Q12 (Courses in health science at Lincoln North Star assist you in affirming your career interests)	1.186	2	.593	.942	.396

Some survey items asked respondents to identify “other” responses not listed.

A small number of students responded to two specific instrument questions. The first focused on listing the type of health care program they were enrolled in currently. The open responses were for responses that did not fit one of the categories. Of the 4 responses, two individuals indicated they were taking program courses in mortuary science and two others were taking basic credits at a community college with hopes of transferring to a radiologic technical program.

An additional open-ended survey item option asked about current student programs. Two students indicated that they had changed majors away from the health care field and toward business and liberal arts, respectively. The other student responded that they were in a five year university program in Belgium.

Summary

This chapter provided the data to answer the research questions central to this study. Data from the study were analyzed and reported. Additional information regarding specific instrument data can be found in at the end of the study (Appendix F). Final conclusions, limitations, and recommendations for current educational

practice are included in the following chapter. In addition, recommendations for future study and research and conclusions are presented in the next chapter.

CHAPTER 5

Summary, Conclusions, Discussion, and Recommendations

This chapter is organized into five sections. The first section gives a summary of the study and the subsequent results that were found. The second section includes findings and conclusions that were made. The third section includes a discussion of the findings and conclusions. In the final section, recommendations for current educational practice and future educational study and research are presented.

Summary

This study examined the perceptions surrounding a current Career and Technical Education program in health science at Lincoln North Star High School in Lincoln, Nebraska. Specifically, the study sought to examine the effectiveness of the program in preparing graduates for post-secondary programs and careers in health sciences.

Statement of the problem. The purpose of the study was to identify current academic and/or career pursuits and perceptions of success of health care students in the workforce following completion or graduation of secondary school. The study sought to determine perceptions of graduates from the pilot high school of the overall effectiveness of their health care introduction program and the extent to which courses contributed to reaching the overall mission of Career and Technical Education within the district. The student respondents were students who had taken courses in the Health Science program at the pilot high school and had graduated from the pilot high school within the past four academic years.

Research questions. The following research questions were developed to guide the research and data analysis in the study. All students who were eligible to participate in the study were asked to complete a survey that focused on identifying answers to the following research questions:

1. To what extent did graduates of the health science program pursue enrollment in a post-secondary health science program?
2. What were the perceptions of these graduates regarding the extent to which participating in the District Health Sciences CTE course led to completion of a post-secondary health science program?
3. What were the perceptions of these graduates regarding the extent to which participation in a District Health Sciences CTE course developed skills that are helpful in transitioning into workforce jobs related to health science after high school?
4. What were the relationship between number of courses taken in the Health Sciences Program and likelihood of enrollment in a health sciences program following graduation?
5. What were the perceptions of these graduates regarding the extent to which specific skills/learning opportunities that are taught within the high school health science curriculum were important to students in post-secondary programs?
6. To what extent did the perceptions of students regarding their post-secondary experiences following participation in the high school program differ based on gender of the student?

7. To what extent did the perceptions of students regarding their post-secondary experiences following participation in the high school program differ based on what year the students graduated from high school?

Review of relevant literature. Career and Technical Education in the United States has not shifted to include pathways for all students in secondary education, linking the schools and the workforce together (Bersudskaya, Chen 2011). One of the newest pathways, health science, is paving the way between secondary education and continuing education and career training following high school, with 98% of students currently utilizing their training in secondary school health sciences to begin or develop a career in health care (Reese, 2007). While initial technical career programs at the high school level were developed for construction trades, factories, and farms (Fletcher, 2006), recent programs have turned their attention to health science and practical nursing programs (Gordon, 2008). Typically, career and technical education programs have mirrored the look of the landscape of the American workforce (Ausman, 2009). Schools are playing catch-up to integrate and modernize their programs to prepare students for industry needs (Ausman, 2009).

The addition of federal standards on education has seen the modernization of career and technical education by providing programs that increase students readiness for college but also prepare students to work immediately after high school (Gibbs, 2006). Health science programs can assist in the development of these programs that seek college preparation in addition to career training. It is now estimated that over half of all students choosing to participate in some CTE curriculum at their school are

taking the bulk of their courses within the college preparatory curriculum (Harris & Wakelyn, 2007).

With the focus of federal legislation on preparing students for the future through preparing them for post-secondary schooling, programs stemming from career and technical curriculum should have the interest of students' lives following high school at the heart of their functionality. The lack of support of particular students can stand in the way of student success (2010). It is estimated by some that nearly one-fifth of high school graduates who are viewed as academically fit for college do not enroll or enter college following high school (Issue Brief, 2007). Specific career pathways programs such as the health science program that was under study in this particular study can help promote college success in science programs in college and distinguish these students academically (Winkleby et al., 2009). The development of a plan and a career pathway can give the students opportunities in the classroom and can predict future success in college (ACT, 2009).

Successful programs in career and technical education focus on applying academic content and skills to real-world problems (Pardini, 2007). These real-world applications can give students relevance to academic programs in school (2007) and can provide students with the academic efficacy they need to be successful at the secondary level (Alfed, et al., 2006).

A successful health science program at the secondary level today would serve to entice people to enroll in health science programs following high school and merge the secondary experience and post-secondary experience together to ensure a successful transition (Samuels, 2011). Current research also suggests that a quality

program will help motivate students to stay in school and help reduce the dropout rate (Alfed, Hansen, Aragon & Stone, 2006). The programs that focus on application based or project-based learning allow for relevance and critical thinking skills to take place and therefore spark motivation in the student who is not easily engaged (Drage, 2010). While these programs develop efficacy in pursuing a career, more study is always needed to determine whether or not these programs can develop the academic efficacy necessary to bridge the gap between secondary programs and continuing post-secondary success (ACTE, 2006).

Methodology. This survey research project used quantitative methodologies to determine the perceptions of a secondary health science program from student participants and graduates of the past four years of graduating classes at the pilot high school. The survey sought to gather data regarding specific courses, content, current educational status, and instructional feedback regarding student perceptions of the curriculum, skills, content and coursework within the program. Surveys were sent to all students who completed at least one course within the program and had graduated from the pilot school in one of the previous four graduating classes (2008-2011). Data was collected from all students who returned the electronic survey instrument. The data was only collected from the past four years due to the ability of the researcher to actively collect demographic data beyond the graduation year 2008. In addition, any eligible participants who are still in school were not eligible because they are still in a secondary program and relevance of the survey does not apply to that population.

The survey for this study (Appendix A) was created by the researcher. The survey has 20 questions that were divided into four separate sections. Part one gathered data regarding student perceptions in specific courses and opportunities that were offered within the program. Part two focused on students who were currently in a health science profession. The profession could be concurrent to their schooling or separate from their schooling. Part two data consisted of two questions that were seeking to gain an understanding of the relevance of secondary curriculum to workforce tasks. The third section focused on specific courses and current post-secondary academic programs. The final section focused on demographic data. Specifically, the fourth section attempted to gain understanding regarding the graduation year of the survey participants and the gender of the survey participants. The survey was reviewed and critiqued by three professionals within the school district. The professionals varied from building level administrators to district curriculum personnel. Professional evaluators were not identified by name in the study.

Data collection began following committee and institutional review board approval. In addition to approval from the University of South Dakota, approval from the school district was also necessary prior to survey distribution. The survey was electronically delivered using SurveyMonkey®. Respondents were sent a link which led to the electronic version of the survey (Appendix E) which included a cover letter introducing the study to the survey taker. Two e-mails were sent out to all participants who had not filled out the survey: one at the beginning asking for them to complete the survey and a subsequent e-mail 10 days later reminding them of

the deadline and asking for those who had not completed the survey to do so and thanking those who had already completed their survey submission.

All data that were collected were analyzed using SPSS version 18.0. Descriptive and inferential statistics were used for analysis of data including frequencies, percentages, means, standard deviations, *t* tests, Analysis of Variance, and Pearson Product-Moment correlation analysis. Two questions allowed for open-ended qualitative data. While a limited amount of qualitative data was collected from the two instrument questions, those who chose to respond with an open response had their qualitative data documented in the results section.

Results

The results of this study included quantitative analysis that examined the health science courses and program at North Star High School. The data also revealed specific information regarding the effectiveness of curriculum and followed up with students after graduating from high school for their perspective on the program.

1. Nearly half (47.5%) of subjects who completed and submitted the survey were either currently enrolled in a health sciences program or had already completed a program. The data suggests that individuals who completed the survey have nearly a 50% enrollment rate after completing the program.

2. The demographic data indicated that 78.7% of the respondents were female, and 19.7% were male. Respondents were asked to select the year that they graduated. The respondents were from a pool of four graduation years (2008-2011). Of the four possible years of graduation, there were 0.0% of students from the

graduation class of 2008. There were 23.0% of students from the graduation class of 2009. The 2010 class had 31.1% of respondents and the 2011 class represented 42.6% of the respondents. 3.3% of students indicated that they either never graduated, or changed schools.

3. Coursework efficacy questions indicated that the majority of the students felt as if the courses were beneficial to them. The number of 63.0% of students felt that the Certified Nurses Assistant course was very helpful in preparing them for a health science program after high school. Students (58.1%) felt Anatomy and Physiology class was very helpful. Students (70.6%) felt that Medical Terminology was very helpful, while 37.8% of students felt that the Introduction to Health Occupations was very helpful.

4. Of the 61 individuals who responded to the survey, 56 (93.4%) of the respondents felt as if the courses were beneficial in giving them a head start in health care over their peers. The responses to this questioning were on a Likert scale with 1 representing the lowest score (no assistance) and 5 representing the highest score (extremely beneficial). The mean score for item 13 on whether or not the North Star Health Sciences Program was perceived as beneficial was above the midpoint. ($M = 4.37$, $SD = .957$). For 56 (93.4%) of the respondents, the program was perceived as moderately beneficial in giving them an advantage in their future employment.

5. The data suggested that 29 (47.5%) of subjects who completed and submitted the survey were either currently enrolled in a health sciences program or had already completed a program.

6. Data indicated that of the 97% of respondents felt that the skills and programs taught were either helpful (4) or very helpful (5) for the confidence of these students who were currently in a health science program beyond the high school level. With a possible range of 1.00 to 5.00, a mean score of 4.19 ($M = 4.19, SD = .819$) indicates a strong perception of confidence in skills due to the health science program.

7. The data collected from the survey indicated that the respondents felt that the skills taught in the program were either helpful (4) or very helpful (5) ($N = 56, M = 4.43, SD = .912$). This finding suggests skills taught in the program would assist students in later programs.

8. The results also indicate the specific certification skills such as CPR/First Aid and Certification in Nurse Assisting were helpful to the students in their future career development ($N = 45, M = 4.16, SD = 1.296$).

9. Qualitative data were collected from a few students who responded to two specific instrument questions. The first dealt with listing the type of health care program they were enrolled in currently. The open responses were for responses that did not fit one of the categories. Of the 4 responses, two individuals indicated they were taking program courses in mortuary science and two others were taking basic credits at a community college with hopes of transferring to a radiologic technical program.

10. Additional qualitative data were collected in the final question of the instrument. The question asked about current student programs. Two students indicated that they had changed majors away from the health care field and toward

business and liberal arts, respectively. The other student responded that they are in a five year university program in Belgium.

11. There was a moderately strong relationship between the number of courses taken in the program and the likelihood of enrollment or participation in a post-secondary health science program. There was a moderately significant relationship between the two variables, ($r = .357$, $n = 42$, $p < .02$). The relationship was significant at the .02 level. When determining the variance between the two variables, a coefficient of determination was calculated at 12.7%. This indicates that the number of courses taken only helped to explain 12.7% of the variance in respondents' scores on skills taught being utilized in health care careers.

12. Instrument questions regarding curriculum indicated that offering outside-of-class or extra-curricular opportunities were the least appreciated among students, with 12.7% indicating that it was not helpful, and 20.0% indicating that it was of little assistance. Of all of the questions regarding curriculum satisfaction, the respondents scored this one the lowest, with only 20.0% of respondents indicating that it was of value.

13. A statistically significant difference based on gender was found in belief that Medical Terminology or Certified Nurses Assistant coursework gave respondents an advantage in their career field as well as whether or not these courses were helpful and relevant. Results of the t test for independent samples indicated a significant difference in mean scores specifically in item number 9 for the boys ($M = 3.20$) and girls ($M = 4.21$), $t(50) = -2.215$, $p = .031$. Because Levene's test indicated a significant value larger than .05 for item 9, equal variances were assumed. In all

items that were analyzed, items 2, 3, and 9 were the instrument items in which a significant difference was found for gender.

14. There were no significant differences found in any survey response data based on graduation year. An Analysis of Variance was performed for each item in the survey instrument. In the analysis, there were no significant differences between groups ($p > .05$) for any of the items that were analyzed. There was no difference in mean scores between the groups.

Conclusions

The following conclusions were drawn from this study.

1. Most students indicated that the majority of the students feel that the courses were beneficial to them.
2. Most students felt that the skills that were taught in the program assist students in post-secondary health care programs.
3. A majority of the respondents feel that the courses in the program were beneficial in giving them a head start in health care over their peers.
4. Some of the graduates who took courses in the program are currently in a health science program or have already completed a health science program at the post-secondary level. Of those who have not, nearly one quarter are in a four-year institution.
5. There is a moderately significant relationship between the number of courses taken in the program and likelihood of enrollment or success in a post-secondary health science program.

6. There are no significant statistical differences between responses based on the year the student graduated.

7. A significant difference exists based on gender in regard to whether or not taking dual, articulated or community college credit courses such as medical terminology and Certified Nurses Assisting course gives students an advantage over their peers and their thoughts on benefits of a two courses. On average, more females than males found this to be an advantage.

Discussion

In the following section, the demographic data as well as each guiding research question will be discussed. Each component will be discussed in an individual section.

Career programs are evaluated while students are still within the program to determine their overall effectiveness (Ausman, 2009). College and career readiness gives us a basis and a purpose to the high school career and technical education evaluation (Hagen, 2010).

The researcher believes that student retention in a career field of interest following high school was, and is, a major indicator of technical education program success. Many students deviate from their educational plans due to poor academic performance rather than an intentional change of interests (Cunningham & Smothers, 2010). A program is successful with providing the students with the self-efficacy to feel comfortable in their desires regarding their future and how to achieve their goals. Nearly 47.5% of respondents indicated that they were enrolled in a health sciences program or had already completed a program, and additional survey instrument data

also validated program-effectiveness. Of all of the items in the survey, item number 11 which asked about relevance in skills taught for post-secondary application, contained the highest mean score for all responses ($M= 4.61, SD= .559$). The results clearly indicated that all of the respondents at least found some degree of relevance in the subject matter for practical use later on in their post-secondary education. All respondents selected a score of at least 3 on the item analysis, and most identified a score of 4 or 5 in their response.

The survey sought to identify the research question about developing ability to complete programs when it asked the subjects about the extent to which the knowledge and skills taught in the course or courses taken in health science at LNS gave you confidence to succeed in your health science program and/or career path? Of the 61 who submitted a survey for analysis, 59 responded to this question (96.7%). Of those who responded, the response rates and descriptive statistics suggested a mean score of 4.19 with a standard deviation of .819 (Pallant, 2010). The score is on Likert scale with a score of 1 representing it did not help with confidence at all and a 5 representing the indication that it was very helpful in their confidence for success in the health sciences career field. The mean score of 4.19 would indicate that the average score was between helpful and very helpful (Pallant, 2010) with confidence of success in a health science program or profession. Perceived self-efficacy is said to develop beliefs about the students' ability to perform certain tasks (Bandura, 1998). This suggests that Bandura's efficacy theory indicates a strong relationship of skills taught within the program and students' confidence following completion of the high school program.

Recent research has shown that CTE engages and motivates students by giving them real world opportunities and challenges that will enhance and provide connection to their education (Harris & Wakelyn, 2007). The majority of students now participating in CTE in their schools are taking courses in the college prep curriculum (2007). The blended curriculum allows students the opportunity to dive further into a potential career path while maintaining an academic rigor. Industry knows that the more applied knowledge that a student will receive, the more the student will be able to contribute to an evolving workforce (Ananda, 2002). While it would seem to be logical that the more a student took in high school, the more likely they would be in enrolling in a program following high school, the data did not suggest a significant relationship between the two. There was no significant relationship between the two variables, $r = .357$, $n = 42$, $p < .02$. When determining the variance between the two variables, a coefficient of determination was calculated. The coefficient of determination was 12.7%. This indicates that the number of courses taken only helped to explain 12.7% of the variance in respondents' scores on skills taught being utilized in health care careers.

Rigorous and relevant are two requirements that are now being implemented in curriculum and graduation requirements for Career and Technical Education (Campbell, 2010). Unfortunately, sometimes educators are not able to grasp whether or not the skills that are included in curriculum are meeting the needs of the students in relation to their effectiveness in industry or post-secondary school.

Data indicates that of the 97% of respondents feel as if the skills and programs taught were either helpful (4) or very helpful (5) for the confidence of these students

who were currently in a health science program beyond the high school level. With a possible range of 1.00 to 5.00, a mean score of 4.19 ($M = 4.19, SD = .819$) indicates a strong perception of confidence in skills due to the health science program. Aside from their feelings about individual courses and curriculum, which also indicated a favorable perception, perception of confidence based on specific skills taught within the program is quite high. A lack of identified concerns or perception of not being helpful would indicate that the overwhelming majority of students feel as if the skills learned have been beneficial or will be beneficial in the workforce.

Because frequency data was collected in the demographic portion of the instrument so that the research could potentially identify areas of need based on gender within the program, item analysis was performed in order to determine if significant differences did exist, and if so, what could be done in order to change those differences in the future. The study data revealed no significant differences except in one item in the survey that asked the extent to which having Medical Terminology and Nurses Assisting as courses where students could gain community college credit was helpful. As previously stated, the mean score for the boys was significantly lower than for the girls regarding their belief that these courses being offered as articulated credit with the community college was helpful. A number of variables could attribute to the significant difference, including current gender data on subjects' current educational status. It is possible that the male students have not been enrolled in a program and therefore would not see the helpful qualities of the courses taken.

Often times, when a course is piloted, it can be difficult for the teacher to grasp the curriculum and modify as necessary during the first several years. Sometimes schools get stuck by not providing professional development and enhancement of these courses after implementing them (Pardini, 2007). In order to be successful, schools need to provide instructional development to focus on implementing content that delivers quality academic and real-world skill development for our students (2007). Sometimes, because the program is new, it often takes several years for it to demonstrate signs of a quality career and technical education program. When developing guiding questions for the study, it was critical to determine when, if not at the beginning, did the perceptions of the program change among students. When examining the data, it must first be pointed out that no data existed from graduates of the 2008 class who were asked to participate in the study. It is inconclusive as to why those who were asked to participate from that class did not participate in the study. Two potential hypotheses are that students from the class that is furthest away from graduation may have changed electronic addresses or they may feel less connection to the high school program.

Regardless, the lack of data from one of the four classes that were being researched likely played a role in the lack of variance in instrument data, based on year of graduation. After analysis, there was no significant variance found on any of the items that respondents were asked to address. It would be reasonable to assume that the lack of variance may suggest that the support measures for the course were put in place from the initial implementation, and therefore served as an immediate method of developing the relevance and rigor so often desired in career programs.

One of the most significant methods of developing success in college is to promote these career programs (Campbell, 2010). With socio-economic data of the school and program being very diverse and student populations changing from year to year, it would be valuable to study these variables further in a longitudinal study. Research has suggested that specific career pathways pipeline students into the health sciences who are in underserved, low-income and diverse areas (Winkleby et al., 2009). In addition, with the industry need for us to develop programs with relevance and integration of academic skills now more than ever, we need to critically analyze our programs on a yearly basis to make sure that we are meeting the needs of our country and our students (Lynch, 2000).

Recommendations for Practice

Based upon the data analysis and conclusions of the study, the following discussion and dialogue provides recommendations for practice. Some of the recommendations that are made can apply to other health science career and technical education programs as well as other career and technical education fields, career clusters, and technical education programs.

1. Health science programs should focus on academic efficacy, as well as skills based and project based learning, so that students are able to feel confident about their ability to be successful in post-secondary health science programs.

2. While it has been common for nursing programs to attract more females than males, the variety in health care fields and diversified health occupations programs in high school should encourage educational leaders to pay attention to the overall gender differences, no matter how subtle, and address the needs of all of their

students while making an effort to increase enrollment and participation from males in secondary health science programs.

3. Student participation in the career and technical education courses is generally viewed as valuable both in the short and long term. Summer programs and extra-curricular pieces to the health science program, however, are in need of some improvement for students to feel as if they are relevant to their future.

4. Skills-based learning was viewed as a positive program aspect for developing both confidence and self-efficacy among the respondents. It is recommended that programs seek to employ more methods and curriculum that focus on projects, skills, and real-world practical application.

5. The school district and school program that was being researched should use their student follow-up data to attract more students to the program.

6. Additional courses that are developed within the program should be developed to afford students college credit, practical skill achievement, or practical application in the health care field because those are areas which students perceived to be important in their academic achievement while taking courses within the program.

Recommendations for Future Research

The findings for this study reveal the need for more research to be done regarding the program that was being critiqued and all of the district career and technical education programs. Due to the lack of district-wide follow-up data regarding a multitude of programs, it is recommended that further study be done to a

larger variety of students regarding their perceptions of curriculum in all areas. The following specific studies are suggested regarding health science programs:

1. While the study did attempt to determine whether or not a relationship existed between the number of courses taken and likelihood of enrollment in a program, further study is needed with more longitudinal data to determine if a relationship does exist.

2. More longitudinal data is needed in order to make recommendations on future programming needs within the program and whether differences do exist from graduating classes. A four year study, while practical for a single researcher to study, does not give enough data to the district to make quality informed decisions regarding changes to the program and/or curriculum.

3. A replication study would be useful for the other areas of career and technical education within the district. Gaining insights regarding student perceptions of curriculum, skills, and application of knowledge in any career and technical education field is something that can be valuable for many years within the school district.

4. A mixed methods approach to studying the program should be done in order to gain valuable information from those students who participated in the program, as well as from curriculum directors and administrators, to determine if there is a relationship between what the district wants the students to be able to accomplish by participating in the program and what the students actually felt they learned.

5. A broad study to include Career and Technical Education programs in the region, or national level would be beneficial. In addition, a specific study focusing on Health Occupations programs throughout the nation would also be beneficial.

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Appendix A
Survey Instrument

Lincoln North Star
Health Occupations Program Survey

Part I

The purpose of this section is to gain an understanding toward your feelings about particular courses you took in the Health Sciences program at North Star. The first question will ask you which courses you took. The subsequent questions will ask you about particular courses. If you did not take a particular course, please do not answer questions relevant to that particular course. An omission of an answer will be collected under the assumption you did not take the course.

1. Which of the following courses did you take while you were a student at Lincoln North Star (Check all that apply)?

- A. Intro to Health Occupations
- B. Medical Terminology
- C. Fundamentals of Health (Basic Nurse Assistant)
- D. Anatomy and Physiology

2. If you took the course *Intro to Health Occupations*, to what extent did the course assist you in preparing you for success in a health sciences program after high school?

- A. No assistance/not helpful
- B. A little helpful
- C. Somewhat helpful
- D. Helpful
- E. Very helpful

3. If you took the course *Medical Terminology*, to what extent did the course assist you in preparing you for success in a health sciences program after high school?

- A. No assistance/not helpful
- B. A little helpful
- C. Somewhat helpful
- D. Helpful
- E. Very helpful

4. If you took the course *Fundamentals of Health/CNA*, to what extent did the course assist you in preparing you for success in a health sciences program after high school?

- A. No assistance/not helpful
- B. A little helpful
- C. Somewhat helpful
- D. Helpful
- E. Very helpful

5. If you took the course **Anatomy and Physiology**, to what extent did the course assist you in preparing you for success in a health sciences program after high school?

- A. No assistance/not helpful
- B. A little helpful
- C. Somewhat helpful
- D. Helpful
- E. Very helpful

6. To what extent did offering the possibility of internships and summer camp opportunities in the program help you with your current health science program or career pursuits?

- A. Not at all
- B. A little helpful
- C. Somewhat helpful
- D. Helpful
- E. Very helpful

7. To what extent did learning specific skills and vital signs assessments help you with your current health science program or career pursuits?

- A. Not at all
- B. A little helpful
- C. Somewhat helpful
- D. Helpful
- E. Very helpful

8. To what extent did certification programs within the courses such as CPR/First Aid certification and licensure and certification as a Nurses Assistant help you with your current health science program or career pursuits?

- A. Not at all
- B. A little helpful
- C. Somewhat helpful
- D. Helpful
- E. Very helpful

9. To what extent did offering articulated credit through a community college in the Medical Terminology course and CNA course assist you with your current health science program or career pursuits?

- A. Not at all
- B. A little helpful
- C. Somewhat helpful
- D. Helpful
- E. Very helpful

- 10.** To what extent did offering advanced placement curriculum in Anatomy and Physiology course assist you with your current health science program or career pursuits?
- A. Not at all
 - B. A little helpful
 - C. Somewhat helpful
 - D. Helpful
 - E. Very helpful
- 11.** What is your perception of the skills and knowledge taught in all of the health science courses at Lincoln North Star in regard to their relevance to real-world skills necessary for health science careers?
- A. Not relevant
 - B. A little relevant
 - C. Somewhat relevant
 - D. Relevant
 - E. Very relevant
- 12.** To what extent did courses in health science at Lincoln North Star assist you in affirming your career interests?
- A. No assistance
 - B. Very little assistance
 - C. Some assistance
 - D. A good amount of assistance
 - E. A lot of assistance
- 13.** To what extent did you feel that taking the courses in health science at North Star gave you a head start in health care education over your peers?
- A. Not at all
 - B. Very little benefit
 - C. Somewhat beneficial
 - D. Beneficial
 - E. Extremely beneficial

PART II. If you have already completed a health science program and are currently in a health science profession please answer the following questions. If you are not completed or not currently in a health science field, you may skip these questions and refer to the last two questions.

- 14.** How many health science courses did you take while at North Star?
- A. None
 - B. One
 - C. Two
 - D. Three
 - E. Four

15. To what extent are the knowledge and skills taught in the course or courses taken in health science at LNS used in your current career on a daily basis?

- A. Never
- B. Seldom
- C. Sometimes
- D. Often
- E. Very often

PART III: Please respond to the following questions regarding the any of the courses that you took while at Lincoln North Star.

16. To what extent did the knowledge and skills taught in the course or courses taken in health science at LNS give you confidence to succeed in your health science program and/or career path?

- A. It didn't help my confidence
- B. It did very little for my confidence
- C. It was somewhat helpful developing my confidence
- D. It was helpful for my confidence
- E. It was very helpful for my confidence

17. If you are currently enrolled in or have completed a health care program or medical program, please specify what type of school (examples: Community college-Medical Assisting)

- A. Post-Secondary 4 year Pre-Professional Program
- B. Post-Baccalaureate program
- C. Post-Secondary Technical Program
- D. Other (Please Specify)_____.

PART IV: Demographic data. For all students taking the survey, please respond to the following questions. Please select the appropriate response. Some questions will only accept one response, others will allow for multiple responses.

18. What is your gender?

- A. Male
- B. Female

19. What was the year that you graduated from Lincoln North Star?

- A. 2008
- B. 2009
- C. 2010
- D. 2011
- E. Never graduated, transferred schools, other.

- 20.** What is your current educational status?
- A. In a four year college or University
 - B. In a professional school
 - C. In a technical school
 - D. Not in school-graduated from post-secondary
 - E. Not in school-never graduated.

Appendix B

Survey Justification Matrix

Survey Justification Matrix

Research Question	Survey Question	References
6. Do the perceptions of students regarding their post-secondary experiences following participation in the high school program differ based on gender of the student?	1. What is your gender	Ausman, 2009; Bierlein & Gaunt, 2007; Gibbs, 2006; Gordon, 2008; Harris & Wakelyn, 2007
7. Do the perceptions of students regarding their post-secondary experiences following participation in the high school program differ based on what year they graduated from high school?	2. What year did you graduate?	Ausman, 2009; Lewis, 2004; LPS, 2012;
1. To what extent did graduates of the health science program pursue enrollment in a post-secondary health science program?	3. What is your current educational status?	Campbell, 2010; Elliot, 2007; Peckham, 2007; Winkleby et al., 2009
4. What is the relationship between number of courses taken in health sciences program and likelihood of enrollment in a health sciences program following graduation?	4. Indicate which course or courses in health science at Lincoln North Star that you completed during your days as a student at Lincoln North Star.	Haney, 2007; LPS, 2011; Lynch, 2000; Packard et al., 2010

Research Question	Survey Question	References
2. What are the perceptions of these graduates regarding the extent to which participating in district health sciences CTE course led to completion of a post-secondary health science program.	5. If you took the course <i>Intro to Health Occupations</i> , to what extent did the course assist you in preparing you for success in a health sciences program after high school?	Bandura, 1994; Fletcher, 2005; Gibbs, 2006; Harris & Wakelyn, 2007; Reese, 2010;
2. What are the perceptions of these graduates regarding the extent to which participating in district health science CTE course led to completion of a post-secondary health science program.	6. If you took the course <i>Medical Terminology</i> , to what extent did the course assist you in preparing you for success in a health sciences program after high school?	Bandura, 1994; Fletcher, 2005; Gibbs, 2006; Harris & Wakelyn, 2007; Reese, 2010;
2. What are the perceptions of these graduates regarding the extent to which participating in district health science CTE course led to completion of a post-secondary health science program.	7. If you took the course <i>Fundamentals of Health/CNA</i> , to what extent did the course assist you in preparing you for success in a health sciences program after high school?	Bandura, 1994; Fletcher, 2005; Gibbs, 2006; Harris & Wakelyn, 2007; Reese, 2010;
2. What are the perceptions of these graduates regarding the extent to which participating in district health science CTE course led to completion of a post-secondary health science program.	8. If you took the course <i>Anatomy and Physiology</i> , to what extent did the course assist you in preparing you for success in a health sciences program after high school?	Bandura, 1994; Fletcher, 2005; Gibbs, 2006; Harris & Wakelyn, 2007; Reese, 2010;
3. What are the perceptions of these graduates regarding the extent to which participation in a district health sciences CTE course developed skills that are helpful in transitioning into workforce jobs related to health science after high school?	9. To what extent did offering the possibility of internships and summer camp opportunities in the program help you with your current health science program or career pursuits?	Alfed et al., 2006; Ananda, 2002; Carter, 2010; Gibbs, 2006; Lewis, 2004

5. What are the perceptions of these graduates regarding the extent to which specific skills/learning opportunities that are taught within the high school health science curriculum were important to students in post-secondary programs?	10. To what extent did learning specific skills and vital signs assessments help you with your current health science program or career pursuits?	Carter, 2010; Drage, 2010; Harada, et al., 2010; Harris & Wakelyn, 2007; Pardini, 2007;
5. What are the perceptions of these graduates regarding the extent to which specific skills/learning opportunities that are taught within the high school health science curriculum were important to students in post-secondary programs?	11. To what extent did certification programs within the courses such as CPR/First Aid certification and licensure and certification as a Nurses Assistant help you with your current health science program or career pursuits?	Carter, 2010; Pardini, 2007;
5. What are the perceptions of these graduates regarding the extent to which specific skills/learning opportunities that are taught within the high school health science curriculum were important to students in post-secondary programs?	12. To what extent did offering articulated credit through a community college in the Medical Terminology course assist you with your current health science program or career pursuits?	Campbell, 2010; Gibbs, 2006; Lewis, 2007; Winkelby et al., 2009
5. What are the perceptions of these graduates regarding the extent to which specific skills/learning opportunities that are taught within the high school health science curriculum were important to students in post-secondary programs?	13. To what extent did offering advanced placement curriculum in Anatomy and Physiology course assist you with your current health science program or career pursuits?	Campbell, 2010; Gibbs, 2006; Lewis, 2007; Winkelby et al., 2009
3. What are the perceptions of these graduates regarding the extent to which participation in a district health sciences CTE course developed skills that are helpful in transitioning into workforce jobs related to health science after high school?	14. What is your perception of the skills and knowledge taught in all of the health science courses at Lincoln North Star in regard to their relevance to real-world skills necessary for health science careers?	Carter, 2010; Dykeman et al., 2007; Lynch, 2000; Reese, 2010; Samuels, 2011

1. To what extent did graduates of the health science program pursue enrollment in a secondary health science program?	15. To what extent did courses in health science at Lincoln North Star assist you in affirming your career interests?	Alfed, et al., 2006; Kotamraju, 2007; Peckham, 2007; Reese, 2011
3. What are the perceptions of these graduates regarding the extent to which participation in a district health sciences CTE course developed skills that are helpful in transitioning into workforce jobs related to health science after high school?	16. To what extent did you feel that taking the courses in health science at North Star gave you a head start in health care education over your peers?	Metcalf, 2010; Reese, 2011; Zaidatol Akmaliah, & Bagheri, 2010
4. What is the relationship between the number of courses taken in health sciences program and likelihood of enrollment in a health sciences program following graduation?	17. How many health science courses did you take while at North Star?	Meeder & Achieve, 2008;
3. What are the perceptions of these graduates regarding the extent to which participation in a district health sciences CTE course developed skills that are helpful in transitioning into workforce jobs related to health science after high school?	18. To what extent are the knowledge and skills taught in the course or courses taken in health science at LNS used in your current career on a daily basis?	Alfed, et al., 2006; Bandura, 1994; Harada et al., 2009; Reese, 2011
2. What are the perceptions of these graduates regarding the extent to which participating in the district health sciences CTE course led to completion of a secondary health science program?	19. To what extent did the knowledge and skills taught in the course or courses taken in health science at LNS give you confidence to succeed in your health science program and/or career path?	Alfed, et al., 2006; Bandura, 1994; Harada et al., 2009; Reese, 2011
1. To what extent did graduates of the health science program pursue enrollment in a post-secondary health science program?	20. If you are currently enrolled in or have completed a health care program or medical program, please specify what type of school.	Campbell, 2010; Elliot, 2007; Peckham, 2007; Winkleby et al., 2009

Appendix C
Survey Critique Sheet

Survey Critique

Please complete the survey and respond to the following questions:

- 1) Were you able to respond to each question?

- 2) Did you notice any issues pertaining to the format or the directions of the survey?

- 3) Did you find any issues pertaining to the content of the survey?

- 4) Any comments regarding the length of the survey? (Too long/short/wordy)

- 5) Please comment on the demographic information collected.

- 6) Were there any problems associated with the wording of the questions or the order in which they were given?

- 7) If you received this survey, would you fill it out? Why or why not?

- 8) Any other comments regarding the survey would be appreciated:

Appendix D
Survey Cover Letter

February 15th, 2012

Dear Lincoln North Star High School Graduate:

My name is Matthew Avey and I am a doctoral student at the University of South Dakota (USD) in the Department of Educational Administration. I am also an educator and program head in the Health Sciences/Health Occupations program in the Lincoln Public Schools. As a graduate of Lincoln Public Schools and a former student in one or more of our Health Science courses, I am writing you to ask for your participation in a brief survey about your experiences in the course and your current career or educational endeavors.

The purpose of the study is to determine the strengths and weaknesses of the program and its overall mission for our students who have graduated from the Lincoln Public Schools and participated in our program. It is my hope that I may identify successful strategies and determine overall effectiveness of the program toward meeting specific program objectives. I am examining only students who have graduated from the Lincoln Public Schools who have participated in one or more of the courses in Health Science. The courses that we have offered in the past include Anatomy/Physiology, Intro to Health Occupations, Medical Terminology, and Fundamentals of Health Careers (CNA course). I believe that this information will provide beneficial information to the district and to educators in the district who are teaching in Career and Technical Education.

I am hopeful that you will take the time to provide information in the enclosed survey. Your information provided is very valuable to my research. All responses will be treated confidentially and no responses will be able to be individually identified. Your participation is voluntary and you may skip any question or withdraw from the survey at any time. Receipt of your submitted survey will serve as your informed consent to participate in this research study.

If at any time you have concerns regarding your rights as a human subject, please feel free to contact the Human Subjects committee through the University of South Dakota Research Compliance Office at (605) 677-6184. I have provided a link to the electronic copy of the survey, as well as my own personal e-mail address should you have any questions regarding the survey information. I sincerely appreciate your input and thank you in advance for completing the survey. I am hopeful that your input will provide valuable information for education and the current programs within the district.

Sincerely,

Matthew R. Avey (Doctoral Candidate)
matthew.avey@usd.edu
(402) 432-0778

Dr. Larry Bright
Doctoral Advisor

Appendix E
District Approval Letters

Lincoln Public Schools

949 West Bond • Box 82889 • Lincoln, NE 68501 •
(402) 436-1790

RR 12-44

February 1, 2012

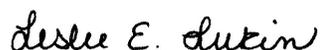
Matthew R. Avey
North Star High School
mavey@lps.org

RE: Request to Conduct Research

Dear Mr. Avery,

Your request to administer surveys to graduates of Lincoln North Star High School is approved. Please contact Fred Skretta, the Principal of North Star High School, to secure his permission to proceed with the implementation of this study.

Sincerely,



Leslie E. Lukin, Ph.D.
Director of Assessment and Evaluation Services

cc: Fred Skretta, Principal of North Star High School
John Neal, Director of Secondary Education
Kay Byers, Supervisor of Elementary Personnel Service

Title of Research: Meeting the Needs of Career and Technical Education: A
Study of Graduates of a High School Health Science Program

Matthew R. Avey
North Star High School
mavey@lps.org

RE: Request to Conduct Research

Mr. Avey,

Your request to administer surveys to graduates at Lincoln North Star High school has been reviewed and approved. The school district has received and granted permission to survey student graduates. I am also granting permission to proceed with the conducting of your research.

Sincerely,

Fred Skretta Ed. D.
Principal, Lincoln North Star High School

Title of Research: Meeting the Needs of Career and Technical Education: A Study of Graduates of a High School Health Sciences Program.

Appendix F

Individual Survey Instrument Data

Lincoln North Star Health Sciences Follow Up Study

Part I: The purpose of this section is to gain an understanding toward your feelings about particular courses you took in the Health Sciences program at North Star. The first question will ask you which courses you took. The subsequent questions will ask you about particular courses. If you did not take a particular course, please do not answer questions relevant to that particular course. An omission of an answer will be collected under the assumption you did not take the course. Which of the following courses in Health Occupations did you take while you were a student at Lincoln North Star (click all that apply)?

Answer Options	Response Percent	Response Count
Intro to Health Occupations	48.4%	30
Medical Terminology	83.9%	52
Fundamentals of Health Care (Basic Nurses Assistant-CNA)	27.4%	17
Anatomy and Physiolo	61.3%	38
<i>answered question</i>		62
<i>skipped question</i>		0

Lincoln North Star Health Sciences Follow Up Study

If you took the course Fundamentals of Health/CNA, to what extent did the course assist you in preparing you for success in a health sciences program after high school?		
Answer Options	Response Percent	Response Count
No assistance/not helpful	7.4%	2
A little helpful	0.0%	0
Somewhat helpful	7.4%	2
Helpful	22.2%	6
Very helpful	63.0%	17
<i>answered question</i>		27
<i>skipped question</i>		35

Lincoln North Star Health Sciences Follow Up Study

If you took the course Anatomy and Physiology, to what extent did the course assist you in preparing you for success in a health sciences program after high school?		
Answer Options	Response Percent	Response Count
No assistance/not helpful	4.7%	2
A little helpful	2.3%	1
Somewhat helpful	14.0%	6
Helpful	20.9%	9
Very helpful	58.1%	25
<i>answered question</i>		43

skipped question

19

Lincoln North Star Health Sciences Follow Up Study

If you took the course Medical Terminology, to what extent did the course assist you in preparing you for success in a health sciences program after high school?

Answer Options	Response Percent	Response Count
No assistance/not helpful	2.0%	1
A little helpful	2.0%	1
Somewhat helpful	9.8%	5
Helpful	15.7%	8
Very helpful	70.6%	36
<i>answered question</i>		51
<i>skipped question</i>		11

Lincoln North Star Health Sciences Follow Up Study

If you took the course Intro to Health Occupations, to what extent did the course assist you in preparing you for success in a health sciences program after high school?

Answer Options	Response Percent	Response Count
No assistance/not helpful	10.8%	4
A little helpful	5.4%	2
Somewhat helpful	10.8%	4
Helpful	35.1%	13
Very helpful	37.8%	14
<i>answered question</i>		37
<i>skipped question</i>		25

Lincoln North Star Health Sciences Follow Up Study

To what extent did offering the possibility of internships and summer camp opportunities in the program help you with your current health science program or career pursuits?		
Answer Options	Response Percent	Response Count
Not helpful	12.7%	7
A little helpful	20.0%	11
Somewhat helpful	18.2%	10
Helpful	29.1%	16
Very helpful	20.0%	11
<i>answered question</i>		55
<i>skipped question</i>		7

Lincoln North Star Health Sciences Follow Up Study

To what extent did learning specific skills and vital signs assessments help you with your current health science program or career pursuits?		
Answer Options	Response Percent	Response Count
Not at all	1.8%	1
A little helpful	1.8%	1
Somewhat helpful	12.3%	7
Helpful	19.3%	11
Very helpful	64.9%	37
<i>answered question</i>		57
<i>skipped question</i>		5

Lincoln North Star Health Sciences Follow Up Study

To what extent did certification programs within the courses such as CPR/First Aid certification and licensure and certification as a Nurses Assistant help you with your current health science program or career pursuits?		
Answer Options	Response Percent	Response Count
Not at all	10.9%	5
A little helpful	2.2%	1
Somewhat helpful	2.2%	1
Helpful	28.3%	13
Very helpful	56.5%	26
<i>answered question</i>		46
<i>skipped question</i>		16

Lincoln North Star Health Sciences Follow Up Study

To what extent did offering articulated credit through a community college in the Medical Terminology course and CNA course assist you with your current health science program or career pursuits?		
Answer Options	Response Percent	Response Count
Not at all	9.3%	5
A little helpful	7.4%	4
Somewhat helpful	9.3%	5
Helpful	22.2%	12
Very helpful	51.9%	28
<i>answered question</i>		54

*skipped question***8**

Lincoln North Star Health Sciences Follow Up Study

To what extent did offering advanced placement curriculum in Anatomy and Physiology course assist you with your current health science program or career pursuits?

Answer Options	Response Percent	Response Count
Not at all	9.3%	4
A little helpful	0.0%	0
Somewhat helpful	11.6%	5
Helpful	30.2%	13
Very helpful	48.8%	21
<i>answered question</i>		43
<i>skipped question</i>		19

Lincoln North Star Health Sciences Follow Up Study

What is your perception of the skills and knowledge taught in all of the health science courses at Lincoln North Star in regard to their relevance to real-world skills necessary for health science careers?

Answer Options	Response Percent	Response Count
Not relevant	0.0%	0
A little relevant	0.0%	0
Somewhat relevant	3.4%	2
Relevant	31.0%	18
Very relevant	65.5%	38
<i>answered question</i>		58
<i>skipped question</i>		4

Lincoln North Star Health Sciences Follow Up Study

To what extent did courses in health science at Lincoln North Star assist you in affirming your career interests?		
Answer Options	Response Percent	Response Count
No assistance	0.0%	0
Very little assistance	1.7%	1
Some assistance	13.6%	8
A good amount of assistance	35.6%	21
A lot of assistance	49.2%	29
<i>answered question</i>		59
<i>skipped question</i>		3

Lincoln North Star Health Sciences Follow Up Study

To what extent did you feel that taking the courses in health science at North Star gave you a head start in health care education over your peers?		
Answer Options	Response Percent	Response Count
Not at all	3.4%	2
Very little benefit	0.0%	0
Somewhat beneficial	12.1%	7
Beneficial	25.9%	15
Extremely beneficial	58.6%	34
<i>answered question</i>		58
<i>skipped question</i>		4

Lincoln North Star Health Sciences Follow Up Study

PART II: If you have already completed a health science program and are currently in a health science profession please answer the following questions. If you are not completed or not currently in a health science field, you may skip these questions and refer to the next section. How many health science courses did you take while at North Star?

Answer Options	Response Percent	Response Count
None	0.0%	0
One	24.4%	11
Two	26.7%	12
Three	28.9%	13
Four	20.0%	9
<i>answered question</i>		45
<i>skipped question</i>		17

Lincoln North Star Health Sciences Follow Up Study

To what extent are the knowledge and skills taught in the course or courses taken in health science at LNS used in your current career on a daily basis?

Answer Options	Response Percent	Response Count
Never	0.0%	0
Seldom	9.5%	4
Sometimes	16.7%	7
Often	35.7%	15
Very often	38.1%	16
<i>answered question</i>		42

skipped question

20

Lincoln North Star Health Sciences Follow Up Study

PART III: Please respond to the following questions regarding the any of the courses that you took while at Lincoln North Star. To what extent did the knowledge and skills taught in the course or courses taken in health science at LNS give you confidence to succeed in your health science program and/or career path?

Answer Options	Response Percent	Response Count
It didn't help my confidence	1.7%	1
It did very little for my confidence	0.0%	0
It was somewhat helpful developing my confidence	15.0%	9
It was helpful for my confidence	45.0%	27
It was very helpful for my confidence	38.3%	23
<i>answered question</i>		60
<i>skipped question</i>		2

Lincoln North Star Health Sciences Follow Up Study

If you are currently enrolled or have completed a program in the health science field, please specify what type of school:

Answer Options	Response Percent	Response Count
Post-secondary four-year pre-professional program (examples: Pre Med, Pre PT, Pre Dentistry)	70.0%	21
Post baccalaureate program (Medical school, Dental school, Nursing school, Chiropractic, etc.)	20.0%	6
Post-secondary technical program (Medical assisting, Surgical technician, lab tech, etc.)	10.0%	3
Other (please specify)		8
<i>answered question</i>		30
<i>skipped question</i>		32

Lincoln North Star Health Sciences Follow Up Study

PART IV: Demographic data. For all students taking the survey, please respond to the following questions. Please select the appropriate response. Some questions will only accept one response, others will allow for multiple responses. What is your gender?

Answer Options	Response Percent	Response Count
Male	21.3%	13
Female	78.7%	48
<i>answered question</i>		61
<i>skipped question</i>		1

Lincoln North Star Health Sciences Follow Up Study

What was the year that you graduated from Lincoln North Star?		
Answer Options	Response Percent	Response Count
2008	0.0%	0
2009	23.0%	14
2010	31.1%	19
2011	42.6%	26
Other (never graduated, changed schools, moved, etc.)	3.3%	2
<i>answered question</i>		61
<i>skipped question</i>		1

Lincoln North Star Health Sciences Follow Up Study

What is your current educational status?		
Answer Options	Response Percent	Response Count
In a four year college or university	67.2%	39
In a professional school (such as medical school, nursing school (BSN), dental school, etc.)	5.2%	3
In a post-secondary technical program (community college or specialty school)	25.9%	15
Not in school-graduated from post-secondary program	0.0%	0
Not in school-never graduated	1.7%	1
Other (please specify)		4
<i>answered question</i>		58
<i>skipped question</i>		4