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Factors Affecting The Academic Success Of High School Students Participating In Dual Credit Career And Technical Programs In Indiana

Jon W. Hineman
Indiana State University

FACTORS AFFECTING THE ACADEMIC SUCCESS OF HIGH SCHOOL STUDENTS PARTICIPATING IN DUAL CREDIT CAREER AND TECHNICAL PROGRAMS IN INDIANA

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Jon W Hineman

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COMMITTEE MEMBERS

Committee Chair: Terry McDaniel, PhD

Professor, Department of Educational Leadership

Bayh College of Education

Indiana State University

Committee Member: Brad Balch, PhD

Dean Emeritus

Professor, Department of Educational Leadership

Bayh College of Education

Indiana State University

Committee Member: Scott Powell, PhD

Associate Professor, Sociology and Multicultural Studies

Ivy Tech Community College

Wabash Valley, Terre Haute Indiana

ABSTRACT

The purpose of this qualitative study was to examine the perspectives of Indiana Career Center directors on factors which affect the academic success of dual credit students participating in career and technical education programs. The theoretical foundation of this study was from Tinto's foundational work on student retention and motivation. The research questions focused on what types of programmatic, administrative, and instructional characteristics influenced the academic success of students. Data for this study were mainly collected through a series of one-on-one interviews using a scripted interview process, followed by a transcript-checking procedure completed by the research participants. Using these primary data sources, a series of careful and detailed coding procedures followed. From the coding process a set of eight themes emerged. The themes were state directives, federal funding, organizational structure, relationships, partnerships, collaboration, cross-curricular connections, and teacher planning structure. Major findings from the research project reflect the importance of collaboration and cross-subject connections. Results give insights to educators and policymakers into the characteristics of successful career and technical programs in Indiana and possible pathways for future improvements.

DEDICATION

I dedicate this dissertation to my loving family, and some very close friends, who gave me continuous support and inspiration to continue the work until it's completion. To my daughter, Dr. Chelsea J Garner, who demonstrated that grit and perseverance will yield academic success even when faced with seemingly impossible tasks and enormous amounts of academic material to memorize. You, your closest friends, and colleagues are truly motivational. To my students, former and current, who continue to make my life a dynamic and engaging experience, this work is for you and for future students who will pass through the career and technical learning centers. To all aspiring educators who continue to discover and develop new and innovative teaching methods: keep up the good work and carry the educational torch into the future. I must also acknowledge the late Dr. S. Samuel Shermis, who has been a guiding mentor and educational inspiration to me since our very first meeting at Purdue. I shall never forget the first time I sat in your classroom, nor the ways in which you have inspired me, and so many others, over the years. Dr. Shermis brought a very insightful perspective to the educational classroom and served as an inspiration to myself and many of my colleagues to study education by diving deep into its foundations, philosophy, and origins.

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CHAPTER 1

INTRODUCTION

Higher education is currently faced with a challenging set of interconnected problems, including high costs, underprepared students, and degree completion rates which average about 55% (McNair et al., 2016). Many attempts at educational reform have been employed as structural or programmatic solutions to these interconnected challenges, but with disappointing results (Modarelli, 2014). In the last decade, educators and lawmakers have promoted dual credit as one strategy to address persistent issues and challenges (Howley et al., 2013). As dual enrollment and dual credit opportunities become increasingly popular in United States schools, the likelihood that high school students will enter into a program to either prepare for the collegiate experience or to take advantage of earning college credit while still in high school increases with each academic year (Giani et al., 2014). As the national workforce training needs change and evolve with technological advancements and innovations in business and industry, the demand for a well-educated workforce is evermore present in the minds of policymakers, academic leaders, and employers. This is evidenced in a change from a focus on excellence and achievement within the K-12 system to a broader focus on the outcome of the K-12 system beyond graduation that prepares students to be college or career ready (Aud et al., 2010).

There have been significant gains in increasing the college-going rate among young people (Jones, 2014). In 2010, according to the U.S. Census, the college degree attainment rate was 29.9% for people 25 years and older. The proportion of young adults participating in

postsecondary courses two years after completing high school was significantly higher in 2006 (62%) than in 1974 (40%; Ingels et al., 2012), an impressive increase of more than 20 percentage points. However, an even greater increase in the number of students pursuing collegiate opportunities and obtaining higher education credits, credentials, and degrees is a current and future national goal.

In many cases, secondary students view their final year or months of high school as anything but a time for academic rigor. Rather, they often consider it as a time to be less active and to participate in fewer activities. This phenomenon is often expressed by restlessness, lowered incentive, and a lack of engagement (Howell et al., 2005; Kirst, 2001). In a dual credit or dual enrollment arrangement, secondary schools can outsource the curricula, and in some cases, the instructors, to higher educational institutions in their efforts to increase the academic momentum and keep student participation and engagement at an advanced level. Contractual partnerships, in various forms, permit colleges to provide academic opportunities to high school students who can gain insight into collegiate culture and academic rigor and take university-level coursework while simultaneously attending secondary school (Bailey et al., 2002). Although secondary educational institutions have not fully transferred the intellectual development of high school students to colleges and universities, they are creating partnerships with higher education institutions commonly known as dual credit, dual enrollment, or early college programs (Alliance for Excellent Education, 2018).

Many solutions have been suggested to improve postsecondary educational outcomes. Some initiatives focus on improving the rigor required for the high school diploma, some suggest incorporating more technology into the learning process, still others promote flipping the classrooms with students independently completing a portion of their schoolwork (Hoffman,

2010). Others suggest aligning secondary curriculum and expectations with collegiate curriculum and expectations. The basic idea is that the experience of completing a college course will convey confidence and instill a greater understanding of collegiate requirements. The increased academic rigor experienced in college classes can help prepare students for courses and experiences they will encounter after entering college. Student success in the postsecondary system is enhanced by both confidence and rigor (Adelman, 2006; Hughes et al., 2012).

Dual enrollment has developed into a popular approach touted for increasing college persistence, retention, and focus; yet the research into the subject is limited. The U.S. Department of Education called for a deeper exploration into common program features, effects on academic performance, state policies affecting these programs, and who participates in dual enrollment (Hoffman & Voloch, 2014). An (2013) noted that when examining data on student performance in dual enrollment programs there are inherent challenges in separating the effects of student motivation from the effects of the programs themselves. Differing models of implementation throughout the United States make it challenging to generalize this separation from existing research.

Purpose

This qualitative research study shall have three purposes. The first is to examine the administrative practices and management strategies of Indiana career center directors which potentially contribute to program effectiveness and the academic success of participating career and technical students. The second is to examine the program attributes (culture and climate) which potentially contribute to student academic success. The third is to examine the teaching methodologies of career and technical instructors which potentially contribute to student

academic success. A case study methodology in the investigation of the program structure and pedagogy shall be used.

This research seeks to clarify several applicable questions related to dual credit programs. Do the managerial practices of career center directors support the current definitions of academic success for career and technical students? Is there agreement among the study participants about the capability of dual credit programs to produce the desired results? Do the programs truly help prepare students for their next level of academic challenge, career move, or transition into the workforce? Are participating students encouraged to set their own academic goals and expectations? What types of engagement techniques are the instructors using? To what degree are secondary level students learning about self-management and time management?

This research could potentially inform policymakers and administrators of improved methodologies for structuring effective career and technical programs for both dual enrollment and dual credit applications. Instructors could potentially benefit from the examination of effective teaching strategies from multiple research locations throughout Indiana. Legislators could possibly benefit as they continually seek solutions for the educational and work-readiness needs of the workforce in Indiana.

Problem Statement

The following is a quote from the University of Indianapolis Center of Excellence in Leadership of Learning (2018):

> Across Indiana higher education is lacking. For every 100 ninth graders, only 70 will graduate from high school within four years. Of those students, only 45 will enter college the following fall. By their college sophomore year, just 32 will still be enrolled. By the end of college, only 16 of those original 100 students will graduate on time. Numbers like

> these are contributing to Indiana's ranking 43rd in the nation for its percentage of adults with a bachelor's degree or higher. To survive and thrive in the 21st century, all students must graduate high school and move on to college. With the U.S. Department of Labor estimating that 90 percent of new jobs will require at least some post-secondary education, it's no exaggeration to say that students' lives depend on it. (p. 2)

Post-secondary vocational educational systems are of critical importance to the development of solutions that are able to respond successfully to the need for higher level career and technical skills. Policymakers and legislators have recognized that high levels of skill and knowledge will encourage and promote the creation of certain economic advantages in a globalized knowledge-based economy (Bathmaker, 2017). Many employers report continued concerns about finding qualified workers who demonstrate collaboration, critical thinking, and digital literacy skills that can transfer through the job market, in addition to particular career and technical skills that are needed in the modern evolving and dynamic workplace (English et al., 2017).

Research Questions

The following research questions will guide this investigation:

1. What are the administrative strategies of Indiana career center directors that contribute to the academic success of career and technical students participating in dual credit programs?
2. What are the dual credit program attributes that contribute to the academic success of career and technical education students in Indiana?
3. How do Indiana career center directors describe effective instructional practices of career and technical teachers?

Theoretical Framework

The foundational work of Vincent Tinto (1975, 1993) described the relationship between the academic and social aspects of a student's decision to either stay in college, be academically successful, or drop out. Tinto identified critical factors which could be used in predicting collegiate completion. Tinto observed and described seven variables that predict a student's level of felt obligation to the college or academic program and to individual goal commitments. Tinto developed a model which illustrated the seven influential elements as they relate to student commitment to remaining in school and in completing their studies.

Academic and Social Aspects of Tinto's Seven Factor Model

1. Social integration experienced by students before entering postsecondary education: To what degree do students feel a sense of belonging and inclusion? (Tinto, 1993).

2. Prior educational experiences and qualifications: How did students perform in previous coursework? How well prepared are students for continued studies? (Tinto, 1993).

3. Family dynamics and cultural background: What are the influential attributes and educational backgrounds of students' families? What is the family socio-economic status? Do any major health and wellness concerns exist within the family? Do family events and dynamics supplement or interfere with academic success? (Tinto, 1993).

4. Individual student attributes: To what degree are students motivated and interested? To what degree do students demonstrate self-management and time management skills? How do students view themselves as learners? To what degree do students demonstrate self-efficacy? (Tinto, 1993).

5. Counseling, coaching, and connecting with available help and assistance: When do the students ask for help? Are students taking advantage of available guidance and assistance resources? (Tinto, 1993).

6. Academic integration: To what degree do students feel connected, included, and a valued part of the academic experience? Do students feel comfortable with raising questions and/or expressing a lack of understanding? Do students hesitate or fail to express a lack of comprehension due to classroom sociodynamics? (Tinto, 1993).

7. Teaching, learning, and support facilities: What are the physical and environmental characteristics of the learning infrastructure? Are the building, classroom, and laboratory accommodations conducive to a learning environment? Are the support facilities easily accessible and available when students need them? In what manner are students made aware of available support networks and services? How are students encouraged to take advantage of support services? (Tinto, 1993).

These background attributes, when combined with the new experiences brought by a post-secondary or dual credit program, will influence a student's commitment for completion and, ultimately, academic success (Tinto, 1993). Using Tinto's (1975, 1993) work as a research lens, this study will focus on dual credit facility and program characteristics, instructional methods, and educational strategies, which affect student academic success and program completion.

In more recent works, Tinto (2017) further refined and described the major experiences and characteristics that positively affect student motivation to complete college and graduate, the first being student self-efficacy, which he proposed as centrally important. Tinto believed that although many students begin their collegiate experiences with strong confidence in their

capacity to succeed, many do not, particularly those whose past experiences lead them to question their own abilities. Student self-efficacy can be taught, and it can be strengthened over time with correct techniques (Tinto, 2017).

The second is a sense of belonging (Tinto, 1975, 1993). Tinto proposed that students must come to view themselves as valued members in a community of fellow students, faculty, and staff. A commitment that serves to hold the individual to the larger group is created in such an environment and therefore encourages persistence. Supportive group membership increases academic completion and program retention (Tinto, 2017).

The third factor Tinto (1993) described was the perceived value of the curriculum. He believed that students must perceive the curricula to be of sufficient quality and relevance to justify their time and energy. The curricula should address the needs and the interests of the students, and it must engage the students in personal and applicable ways (Tinto, 2017).

Engagement Theory

Collegiate and academic success can be directly linked to teaching practices that increase student engagement and to the academic settings that support and supplement engaging teaching practices (Wolf-Wendel et al., 2009). Engagement theory examines how teaching and learning environments and school cultures contribute to maximize student participation in ways that lead to their academic success (Kuh et al., 2010). Engagement theory is therefore well suited as a methodological framework for this research because it considers the teaching activities and learning techniques which encourage student engagement.

Student engagement is defined by Appleton et al. (2008) as the degree of interest, attention, curiosity, passion, and optimism that students demonstrate as they are being taught or while learning. Their work described meaningful educational engagement as a plural construct of

behavioral, cognitive, and emotional factors, all of which combine to create the overall learning experience. Student engagement is more complex than appropriate classroom behavior. Students can comply with the rules but be only passively engaged. Passive engagement limits learning capacity (Fredricks et al., 2004).

Significance

Significant research into the applicable techniques and practices for effective dual credit experiences has yet to be completed (Edwards & Hughes, 2011). Dual enrollment programs have been implemented across the United States with a focus on efforts to increase the numbers of individuals with post-secondary credentials; reduce the time needed to earn a credential, certification, or degree; and decrease the total cost of a college education. The critical need for a highly skilled workforce is a more recently recognized driving force (Allen & Dadgar, 2012). Policymakers may potentially use the findings of this study to implement more effective administrative approaches, encourage innovative teaching and learning techniques, improve and strengthen stakeholder connections, and develop new program designs and pedagogical approaches to increase the overall academic success rates for students participating in dual credit programs.

Key Concepts and Definitions

Academic failure is unsuccessful performance in school, including failing a course, dropping out of school, or remaining in the same grade (Costa et al., 2017).

Academic success is successful completion of coursework and objectives provided in a dual credit program, including graduating high school, transitioning into college, completing benchmark credentials applicable for employment, earning satisfactory test scores, and demonstrating proficiency for recognized certifications (York et al., 2015).

Active learning is the utilization of a variety of teaching methods whereby students are effectively engaged, either in groups or individually, in the learning process through a variety of activities which involve higher order thinking followed by a period of review (Blaz, 2018).

Advanced placement courses are opportunities for high school students to complete college-level coursework. AP courses require passing scores on national standardized exams that translate into advanced credits after students are accepted into college (Ferguson, 2014).

Concurrent enrollment is a dual enrollment design where a course is offered in a secondary school classroom using approved high school teachers. Participants earn high school credit and college credit if a memorandum of understanding exists between the secondary school corporation and the sponsoring institution (Education Commission of the States, 2015).

Core transfer library is an approved list of curricula offered by one or more public institutions which transfers to all other public educational entities in the state as academic equivalents, created by the Indiana general assembly in 2005 (Indiana Commission for Higher Education, 2018).

Dropout rate refers to the percentage of students who leave school before completing their high school diploma (Gottfried & Plasman, 2018).

Dual credit course is a subject taken by students in order to simultaneously earn collegiate and high school credits. Dual credit teachers are either secondary instructors with proper credentials, college professors, or adjunct collegiate faculty. In some cases secondary students participate in their dual credit at their local school; in others they travel to a nearby college (Indiana Commission for Higher Education, 2018).

Dual credit programs are educational programs where high school students enroll in collegiate-level courses prior to finishing high school. High school and college requirements are completed by a single course (Tobolowsky & Allen, 2016).

Early college is an academic sequence comprised of dual credit courses or concurrent enrollment courses. Participating students can earn their high school diploma and academic credits towards either an associate's or baccalaureate degree. Top-performing students can graduate from both high school and college at the same time (Tobolowsky & Allen, 2016).

Eligible institution is an accredited public or private college or university.

Engagement is the magnitude of energy, the amount of focus, and the dedicated time and drive a student devotes toward useful educational activities. Engagement is a multi-faceted notion involving academic, behavioral, and cognitive components. Engagement includes student interest in school and coursework, internal motivation, student self-efficacy, and self-management strategies. Engagement serves as a key summary marker for the quality of student experiences that contribute to learning and achievement (Fredricks et al., 2004).

Factors are elements of the educational experience which contribute to student academic success or failure (Hans, 2012).

Graduation rate is the proportion of students who complete their high school programs as compared to high school enrollment (Tobolowsky & Allen, 2016).

Involvement is when students participate and effectively collaborate with their instructors, academic staff members, and other students. Involvement mirrors the quality and quantity of physical and mental energy that students devote to the academic experience (Astin, 1984).

Preferred provider list is an approved listing of post-secondary institutions which may sponsor dual credit courses in the state of Indiana. It was created by the Commission for Higher Education (Indiana Department of Education, 2018).

Summary

Many industries in the United States are experiencing a shortage of workers who possess the necessary skills and credentials to replace an aging workforce. Declines in postsecondary attainment combined with a highly competitive global economic system have created a serious vacuum for employers. Current business models are becoming increasingly complex with the incorporation of emerging technology and the constant focus on greater efficiency (Barnett & Stamm, 2010; Carnevale et al., 2010).

This dissertation will examine dual credit program attributes and instructional methodologies at multiple career and technical centers across the state of Indiana. Data will be collected in order to examine and better understand what types of program characteristics, administrative strategies, and instructional techniques contribute to the academic success of participating students. Both administrative and instructor perspectives for dual credit programs are of interest to this study. For this research project, career and technical centers which partner with multiple high schools and which offer a variety of career and technical programs will be selected.

This dissertation will be separated into five sections. Chapter 1 provides foundational and introductory information focused on the research questions to be answered and the problem statement. Chapter 2 is a review of current literature applicable to student academic success and dual credit programs. Chapter 3 examines the research questions, methodological approach utilized in gathering and analyzing the data, and the study limitations and delimitations. Chapter

4 will examine the findings from the research efforts, and Chapter 5 will provide a discussion of the results, recommendations for additional study, and conclusions.

CHAPTER 2

LITERATURE REVIEW

Introduction

College entrance after secondary school graduation and other higher educational pursuits has long been an aspiration of many individuals. Most Americans consider a college-level education a basic requirement for a career pathway that provides an adequate rate of compensation and future success (Barnett & Stamm, 2010). The majority of high school seniors declare their intention to attend college (U.S. Department of Education, 2007). However, the transition into college from high school has too often been rough or unsuccessful for many students. Great numbers of students have entered into college with strong academic knowledge and skills, then discovered that they faced significant struggles to succeed in the new educational setting (Conley, 2010). The reasons for these transitional difficulties are varied and the subject of much debate. Bailey et al. (2002) disclosed in their research that about 37% of high school graduates who transition to college right after graduation leave within two years without earning a degree or certificate; far too many students have historically spun their academic wheels without gaining much traction.

Researchers have pointed to driving factors which have contributed to the increased interest and need for dual credit and similar programs. Modarelli (2014) revealed that the global, knowledge-based nature of major economies, coupled with the emergence and continued integration of technology in increasingly sophisticated workplace environments, has fueled great

interest in education. The Lumina Foundation (2016) found that too few students were first completing high school then moving on to earn certifications and degrees to help meet the needs of employers. State and national policymakers have also noted the need for greater educational attainment and progress to meet workforce needs (Lumina Foundation, 2016). These concerns and related educational challenges encouraged legislatures to promote initiatives and new models of education which sought solutions to meet ever-growing workforce needs. The legislative agendas have been focused on producing a workforce that is highly skilled and well-educated. (Lumina Foundation, 2016). The rapid advancement of technology and its multiple applications in many facets of the human experience have fueled an ever-growing demand for post-secondary education. The workplace has grown increasingly complex, interwoven, and technologically interdependent (Carnevale et al., 2010).

In light of the educational goals associated with producing a capable workforce that emphasize college readiness and degree completion rates, dual credit emerged as a means for greater numbers of high school students to get into and through college (Bers et al., 2015). Dual credit and associated forms of advanced educational opportunities offered potential solutions to an array of educational challenges (Chambers, 2012). Dual credit was found to be a means by which high school students could access college early and complete a single course or multiple courses (Bers et al., 2015). Dual credit programs have been found to provide potential employment opportunities to students who successfully completed their programs (Barnett & Hughes, 2010).

Since 2007, increasingly greater interest has been shown for implementing dual credit and other forms of early college for an ever-increasing student population. These trends have been predicted to continue to grow given the emerging needs of the economy for a well-educated

workforce (Bers et al., 2015). Students have been encouraged to participate in opportunities to start their collegiate experiences early to either transition into the college setting for continued studies or to complete specific and dedicated areas of career and technical training in preparation for assuming a position in the workplace (Allen & Tobolowsky, 2016).

History

Historically, only the highest achieving students participated in accelerated collegiate programs. Dual credit and advanced placement were only available to the top performers and students with the means to take advantage of the opportunity. Students who were college bound, White, with a higher socio-economic status were the likely participants. Educators and researchers alike have long been aware that socioeconomic status has measurable effects on educational preparation and college readiness (Conley, 2010). By offering college-level coursework to high school students, opportunities were created to increase the quantity of high schoolers who successfully transitioned to college and completed a credential or degree. These programs were designed to permit a student to join a collegiate level course offered in their high school, which is instructed by a secondary level teacher or by a collegiate professor who commutes to the high school campus (Hoffman, 2010).

Accelerated college credit programs focus on providing opportunities for improving student educational outcomes by immersion into rigorous collegiate coursework through both direct and indirect experiences with the collegiate campus (Allen & Tobolowsky, 2016). Norris (2014) described direct experiences as those where high school students took their classes on a college campus or via distance education and indirect experiences as those where high school students took their college courses on their high school campuses.

Dual Credit Origins and Emergence

The origins of dual credit has been somewhat debated. According to the work of Franklin (2010), the practice of allowing students to earn collegiate credits simultaneously while still attending high school was an idea propagated by J.W. Osborn during the 1920s. Osborn believed that the added rigor in collegiate level coursework would benefit those students who demonstrated greater intellect and ability (Franklin, 2010). During the 1920s, some educators supported the community college movement of the day and promoted the idea that much could be gained from promoting student progression from high school to college. These efforts were apparently undermined by the structural differences between secondary school systems and collegiate institutions (Mayo, 2012). By the 1970s, those educators promoting dual credit had discovered ways to overcome the structural differences and were able to create working collaborations between high schools and college partners (Mayo, 2012).

Syracuse University offered their first dual credit program back in 1973. The program was called Project Advance. High school teachers partnered with college professors to modify single-semester college coursework into two-semester dual credit courses in various and applicable subjects (Exby, 2014). The program was an effort to reduce *senioritis*, or academic restlessness among high schoolers. Dual credit was thought of as a strategy allowing exceptional students to stave off dullness and examine fresh ideas and additional topics more completely (Boswell, 2001). In this early model, students had more time to complete their collegiate coursework and were tasked with taking an exam crafted by the collegiate faculty in order to complete the course objectives and receive credit. These types of academic and systematic criteria contributed to the success of the programs (Gurule, 1997).

LaGuardia Community College in New York City followed Syracuse in 1974 (Boswell,

2001). Their program was called the Middle College High School program. LaGuardia's approach promoted the creation of rigorous academic environments and provided intensive student support through both faculty and peers. Additional counseling services were also provided, helping students determine which curricular pathway to pursue (Cunningham & Wagonlander, 2000). According to Clark (2001), the Middle College program was replicated at 24 other locations and ultimately served thousands of students. Key features that were thought to contribute to its success were the pre-college experience, the intensive counseling, and extra tutoring for at-risk students.

Adelman (2006) noted that dual credit programs evolved into collaborative arrangements between higher education sponsors and participating high schools and provided pathways to degree completion or a seamless transition into the workplace. These opportunities applied to traditional academics as well as career and technical pathways offered by many community colleges. Since their inception, dual credit programs have expanded nation-wide, having caught the attention of foundations and colleges alike (Bailey et al., 2002).

Dual Credit Programs at State Levels

As a result of increased interest and demand for dual credit opportunities, multiple state legislatures and policymakers implemented state-level policies that created provisions, guidelines, and criteria for running dual credit programs (Robertson et al., 2001). Minnesota was first with their Post-Secondary Enrollment Options (PSEO) program, which started in 1985 (Boswell, 2001). Under the PSEO program, the state of Minnesota paid for the tuition of any student in Grades 11 or 12 who met regular admissions standards of the sponsoring colleges. Students took their college courses on the college campuses. The PSEO program proved itself to be successful, and other Midwestern states, including Indiana, Michigan, and Ohio, adopted the

Minnesota model by establishing dual credit legislation at state levels (Boswell, 2001).

Washington state legislators, who also recognized the success of the Minnesota model, created their own dual credit program called Running Start to multiply the educational prospects for high school students (Boswell, 2001). The Washington program allowed qualified students in the 11th or 12th grades to take tuition-free college level courses at community and technical institutions. Later, in 1994, the lawmakers expanded the program to include four-year universities because some school districts did not have a local community college (Boswell, 2001).

Virginia offered dual credit programs beginning in 1988, with an emphasis on systematic student conversion into college level coursework from their high school settings, collegiate success being the central focus (Jones, 2014). Texas started tracking dual credit enrollment in 1999, although some programs existed prior to that date (Thevenot, 2010). The Texas focus was in vocational and technical trades as well as collegiate transition (Giani et al., 2014). California's dual credit programs started in 1976 (Allen & Dadgar, 2012). Illinois launched their dual credit program efforts in the 1970s (Lichtenberger et al., 2014). In Indiana, dual credit started with Vincennes's University's project EXCEL in 1975. Using a wider lens, the popularity of dual credit was detailed by Kuh et al. (2010), who reported that 57% of post-secondary institutions in 38 states offered dual enrollment programs.

Benefits of Dual Credit Programs

An (2013) found several positive implications for students participating in dual credit. He proposed that dual credit opportunities enhanced regular school effectiveness, improved connections between secondary and post-secondary institutions, increased the academic success of post-secondary students, and reduced the need for remediation. Allen and Dadgar (2012)

noted various benefits of dual credit, but they expanded on the most obvious ones; they included the experience of increased academic rigor of dual credit coursework and the reduction of culture shock as students move from high school to college. They proposed that these benefits are of equal or greater value than earning college credits, reducing the educational timeframe, and decreasing educational expenses. Allen and Tobolowsky (2016) described dual credit benefits in terms of reduced student boredom and increased rates of academic progress. They also noted reduced educational expenses, increased student connections with post-secondary institutions, and opportunities for earning a high school diploma while simultaneously working towards a certification or a degree as other potential benefits. Barnett and Stamm (2010) noted that gifted learners had the opportunity to make better use of their senior year in high school while simultaneously getting a head start on college curriculum. Norris (2014) proposed that allowing students to immerse themselves in a college experience prior to setting foot in a collegiate classroom was an underlying benefit for dual credit offerings as well.

Delbanco (2012) pointed out that college enrollment over the last third of the 20th century, and into the beginning of the 21st century, has increased and become more inclusive and widely available. These trends are largely driven by the needs for a well-educated workforce with individuals who have earned degrees or applicable certifications recognized by business and industry. In contrast, Callan et al. (2006) revealed some challenges to this increased college availability. They pointed to gaps in academic performance between the middle to upper income populations and those of lower income. Although educators know this phenomenon has existed for many decades, it still has the potential to jeopardize the rates of degree and certification attainment in the United States. Nationally, the sobering reality is that we are in danger of entering into a time where the quantity of college-educated workers required to sustain the

national economy will be in short supply. The potential consequences could be a reduction in the per capita income and a national workforce that loses its status as highly skilled (Callan et al., 2006).

In efforts to address workforce and training needs, most states created community college systems with open access to college for everyone, regardless of academic credentials (Britt & Karabel, 1989), whereas most universities maintain a merit-based system as a condition of admission (Britt & Karabel, 1989; Ravitch, 1983). Along that line of thinking, Delbanco (2012) and Hughes et al. (2012) both revealed that most people entering college and earning a degree are middle to upper income and White. This scenario is not reflective of the demographic realities and expanding numbers of multiple ethnicities which are steadily increasing in this nation (Delbanco, 2012; Hughes et al., 2012). One approach to solving this critical issue is to offer dual credit enrollment opportunities, which serve to expand college admissions in a more inclusive manner. In these types of socio-economic situations, dual credit gives greater collegiate opportunity to those who might otherwise not qualify or to those who are not confident in their academic ability.

According to Conley (2005), the American educational system has evolved and developed into two major components: secondary and postsecondary. These systems developed in isolation from each other with pointed differences in their goals and objectives. As a result, a large deficit exists between what students encounter in high school and what they need to know to experience success at collegiate level (Conley, 2005). In years gone by, this was not a huge problem, since most students did not go on to college. But today, when the majority of secondary students express their intent to advance into postsecondary training of some sort, and given the critical need for a well-educated and skilled workforce, it has evolved into a critical issue

(Lumina Foundation, 2016).

Conley (2010) developed a conceptual framework for describing the critical components in high school that contribute to collegiate success. He argued that college students are required to use higher order thinking skills with precision and accuracy. Additionally, college students must demonstrate characteristics of self-management and apply key concepts and knowledge to enhance their understanding of a subject (Conley, 2010).

Conley (2010) considered the engagement of critical thinking as one good example to illustrate the different requirements for students in secondary versus post-secondary settings. In secondary classes, students are often tasked with describing or determining a clear *correct* or *incorrect* answer. In contrast, students in post-secondary are often challenged with applying sets of rules and concepts, or extrapolating conclusions from subject matter that leads to potential answers to particular problems (Conley, 2005). Conley (2010), in continued research, found that college students are asked to communicate with clarity and precision, first studying language and communication in great detail and then demonstrating proper language usage in a variety of settings. In contrast, secondary schools teach English in discrete, unconnected units, which may or may not provide increasingly challenging expectations. Conley (2010) found that in science and mathematics, the critical skills of applying reasoning and problem solving inherent in the discipline are not developed in secondary school; rather, discreet skills are taught with little connection between classes, so students often do not see the relevance between subjects (Conley, 2005). Conley (2007) proposed that high school students must be given increasingly challenging curricula that build a four-year sequence and take academically rigorous classes to develop the mindset needed for academic success in college. Conley (2007) observed that a coherent high school academic program that maintains high standards for intellectual and skill development

was the path to a seamless college transition.

Increased student readiness for full transition into postsecondary education and accumulating college credentials simultaneously with high school credits was found to be a central theme for dual credit programs. The introduction of college level rigor and skills needed for success are also a potential benefit (Long et al., 2012). The popularity of these programs continues to grow, and there is a certain sense of earnestness to increase postsecondary achievement for all students. The types and kinds of accelerated programs offered across Indiana and the United States vary, and the educational results for students do as well (Conley, 2010).

Pierson et al. (2017), working for the National Center for Education Evaluation (NCEE), conducted a study of early college and dual credit programs in the State of Oregon which has very similar workforce development goals to the State of Indiana. Oregon has a postsecondary attainment goal of 60% for the entire population by the year 2025. Like Indiana, Oregon is using multiple approaches to achieve the 2025 goal. Pierson et al. (2017) noted that all 17 community colleges in Oregon and four other institutions offered dual credit and accelerated credit programs. Although accelerated program subject matter offerings varied widely across Oregon, students were eligible if they were 16 or older, were in Grades 11 or 12, and had an educational learning plan detailing how the accelerated coursework was relevant. Much emphasis was placed on historically disadvantaged groups. Pierson et al. (2017) concluded that pupils who partook in the programs had a greater likelihood of enrolling and finishing a postsecondary degree or certification. There were some observations as to variations of access to accelerated programs across all schools. Their research indicates high schools were less likely to offer college credits to their students if they were located in rural or low-income areas.

Lochmiller et al. (2016) found that rural schools tended to offer fewer dual credit opportunities and experienced lower enrollments than their urban counterparts. Their research indicated that females tended to enroll more often than males in dual credit offerings. On the other hand, Pretlow and Wathington (2014) provided evidence that larger dual credit enrollments occurred at rural high schools compared to urban schools in their comparison of Ohio dual credit programs to those of Virginia. This tendency was found to be related to rural high schools utilizing greater amounts of dual credit courses, while urban schools made more use of advanced placement programs (Gagnon & Mattingly, 2016).

Several states are seeing significant increases in dual credit programs and course offerings in urban and rural areas alike (Williams, 2010). One of the reasons for this general increase across the United States has been attributed to greater legislative support, focus, and directives (Edmonds & Squires, 2016). Coordinating and oversight boards have been formed and have been tasked with defining the parameters for educational quality, overall expectations, and monetary funding models for dual credit programs and courses (Malin et al., 2017). Ferguson (2014) found that the reduction in tuition and other costs, as well as contributing social factors, helped increase rural student dual credit participation.

Pretlow and Wathington (2014) found that increases in dual credit program growth tended to cause the creation of other dual credit opportunities at surrounding locations. In addition, more fruitful exchanges between high school and college students were noted (Lile et al., 2017). Younger students tended to view their academic activities with more seriousness as a result of interactions with older students (Lile et al., 2017). The work of Henderson et al. (2016) showed that when high school administrators saw a need for additional dual credit course offerings, they sought partnerships with local colleges and universities. The administrators

recognized that the duel credit model permits the overlapping of secondary and post-secondary systems. This sharing of responsibility allows students a smoother transition from one system to the other, enhancing the opportunities for academic success (Henderson et al., 2016).

Emerging programs in science, technology, engineering, and mathematics (STEM) have been a catalyst for dual credit programs designed specifically for STEM classes (Mattson, 2011). Through the Race to the Top initiative, lawmakers in Tennessee initiated the creation of dual credit courses designed for STEM subject matter (Boser, 2012). New York, Georgia, and Hawaii have developed STEM-related programs with the intent to continue scaling them up (Mattson, 2011).

Dual Credit Structure and Student Eligibility

While all forms of dual credit seek to provide collegiate-level coursework to high school students, a fair amount of variation exists in the structure, facilitation, and delivery across the United States (Pretlow & Wathington, 2014). Four general areas of variation have been noted most often in a review of the literature: funding models, program location, instructor credentials, and student eligibility.

The eligibility guidelines for student participation in dual credit programs are most often set by state policies (Pelletier, 2018) and those of the local school systems and post-secondary organizations. Dual credit agreements and memorandums of understanding are drafted, agreed upon, and signed by both institutions (Vargas, 2014). Student eligibility requirements generally include grade point average (GPA), standardized test scores, class ranking, and grade level (Kim, 2008). Some schools require students to secure letters of recommendation from teachers or community leaders, meet specified course prerequisites, or get parental permission as conditions of admittance (Marken et al., 2013).

School grade level is the most commonly shared requirement for dual credit eligibility throughout much of the United States. The majority of students taking part in dual credit programs are typically in the 11th or 12th grade (Marken et al., 2013). Conversely, Borden et al. (2013) found that freshmen or sophomore students could participate in dual credit courses sponsored by some community colleges. Even younger students are allowed to enroll in dual credit programs in some states; Florida admits students as early as the sixth grade if certain eligibility criteria are met (Florida Department of Education, 2014). Maine allows middle school students to participate by allowing the sponsoring colleges or universities to waive grade-level requirements (Education Commission of the States, 2015).

A minimum GPA may be required for dual credit enrollment, but the prevalence of this requisite has decreased during the last few years. Marken et al. (2013) found that 13 states applied GPA requirements for dual enrollment in 2013, but that number had reduced to six only two years later, in 2015. Further, specific GPA guidelines vary by state. Florida has two distinct GPA guidelines depending on the curricular pathway the participating students follow. Academic studies require a 3.0 GPA, while a 2.0 is needed for career studies (Florida Department of Education, 2014). North Carolina requires a higher GPA at 3.5, as does Georgia. The state of Maine requires a GPA of 3.0 (Education Commission of the States, 2015).

The work of Hughes et al. (2012) reinforced the premise that the dual credit concept was first implemented to give above-average students greater academic challenge. Students could experience academic rigor which they otherwise would not in a standard secondary level classroom. Allen and Tobolowsky (2016) revealed that while the original intent and practice was for advanced students, later developments in dual credit were not exclusively for gifted learners.

The opportunities offered through dual credit have been expanded as a result of emerging

needs, both of students and their potential employers. School systems recognize diversity among learners and are utilizing more holistic approaches to educate and train them. A conventional dual credit program has an assortment of intelligence levels and a variety of student ethnicities and backgrounds (Alfeld & Bhattacharya, 2012).

Dual Credit in Indiana

Vincennes University's Project EXCEL was the original dual credit opportunity offered in Indiana starting in 1975. This project has proven to be successful and continues to operate at the time of this writing. Project EXCEL offered participants transcripted college credits to high school juniors and seniors who met all applicable course prerequisites (Vincennes University, 2018). *Transcripted* means that the post-secondary establishment must provide student transcripts which show the college credits earned (Indiana Department of Education, 2018).

As the popularity of dual credit in Indiana increased, Ball State University created a College Transition Program for students in east central Indiana. Indiana State University created a College Challenge program originally working with 15 area high schools, while the University of Southern Indiana's *College Achievement* program catered to high school students in the southern portion of the state (Plucker et al., 2006).

Indiana University started an Advanced College Project (ACP) in 1981, where students from Indiana, Michigan, and Ohio could earn college credits while still in high school. Indiana's ACP approach was modeled after Syracuse University's *Project Advance* and served as a model for other dual credit programs nationwide (Plucker et al., 2006). Strong academic requirements and rigorous standards set by the National Alliance of Concurrent Enrollment Partnerships (NACEP) contributed to the long-term success of the Advanced College Project (Plucker et al., 2006). High retention rates and high GPAs were indicators of the program's success.

Purdue University offered a very selective dual credit program in collaboration with seven Indiana high schools. The admissions criteria was rather rigorous as well. Students had to complete a year of secondary school biological science earning a "C" or better grade and complete a year of chemistry, or a combination chemistry-physics course, or traditional physics with grades of "C" or higher. In no case was a "D" or lower in any academic subject allowed. Minimum allowable GPA was 2.5/4.0 (Peters & Mann, 2009; Purdue University, 2018).

Trine University offered two options for their dual credit students that were uniquely named but of a familiar design. One was termed *The Campus Experience*, where students take collegiate courses either on the Trine University campus or online (Trine University, 2018). The second was termed *The Academic Experience*, in which adjunct/hybrid instructors, who were also teachers in high schools, taught the courses during the regular school day. Trine University policy required students to earn a grade of "C" to receive full college credit. Trine partnered with 31 high schools in the northeast section of Indiana (Trine University, 2018).

In Indiana, dual credit courses have generally been taught by high school instructors or college professors at the high school site, at the college or university, or on occasion, in an online format (Indiana Commission for Higher Education, 2018). The intent of the dual credit programs has been multi-dimensional. Through their dual credit experiences, students could have expanded opportunities for completing collegiate level coursework, fulfilling their academic or technical honors diploma requirements, helping themselves prepare for a college experience, or increasing their opportunities for immediately transitioning into a job or career (Conley, 2010).

Indiana state law requires that dual credit programs in Indiana be established through the creation of, and adherence to, a formal memorandum of understanding (MOU) between the school corporation and the sponsoring post-secondary institution. (Indiana Code IC 21-43-1-2.5,

2014). The MOU documents all aspects of the dual credit arrangement. The sponsoring university or college is accountable for the specific dual credit criteria, including instructor credentialing requirements, how credits shall be awarded, and course curricula design and delivery specifications. The methods by which high school partners are officially notified that their students have earned collegiate credit is also specified in the MOU (Indiana Code IC 21-43-1-2.5, 2014).

As the programs in Indiana took on more relevance, the 114th General Assembly passed the House Act 1347 in 2006. This required schools in Indiana to offer at least two dual credit classes (Cavazos, 2017). The law required school corporations to inform students in Grades 8 and above as to any dual credit opportunities available. The law allowed a college or university the option of establishing policies that set minimum preparation or entry requirements (Indiana Code IC 21-43-1-2.5, 2014).

Indiana passed legislation in 2011 eliminating grade-level requirements for dual credit programs. Indiana uses two major categories for dual credit courses: career and technical education and priority liberal arts (Indiana Code IC 21-43-4-6, 2014; Indiana Department of Education, 2018). Prior to 2005, dual credit students sometimes faced difficulties in transferring their earned dual credits to the college of their choice. In response to this issue, the Indiana legislature directed the creation of the Core Transfer Library (CTL), a collection of approved courses which more easily transfer from one post-secondary institution to another among all Indiana public colleges and universities. The courses in the CTL count as one-to-one equivalents anywhere students choose to matriculate in Indiana (Kadlec & Gupta, 2014).

Secondary and Post-Secondary Academic Differences

High school students have been found to lack an understanding of how colleges function

as a system and a culture; this scenario has proven to be a challenge to dual credit success. These shortfalls in comprehension about the context and inner workings of the collegiate experience result in many students feeling alienated and frustrated (Conley, 2010). As dual credit programs have become more widely offered to a range of high, middle, and lower achieving students in more and more localities, a great variation in program characteristics has been noted (Plucker et al., 2006).

Conley (2010) proposed that understanding the fundamental differences between secondary schools and collegiate systems would potentially improve the alignment between the two. “We cannot fully comprehend and act on what it takes to make students ready for learning beyond high school until we have taken into account the ways in which the two environments differ along a number of dimensions” (Conley, 2010, p. 42). Instructor expectations for student performance between high school and collegiate courses are likely to be much different. As such, Conley also encouraged an open-minded approach to the differences and the elimination of any preconceptions that secondary and post-secondary instructors might have about each educational level. Being open-minded would allow instructors greater opportunity to understand what is expected, what is valued, and in what ways students are likely to react to the requirements and challenges at each level. The improved understanding would likely yield better alignment between the two levels, which has the potential to improve dual credit experiences and increase participating student success (Conley, 2010).

Career and Technical Education

In 1917, the Smith-Hughes Act created a national model for the funding for vocational and technical training for students in secondary education (Silverberg et al., 2004). The act was changed and edited in multiple revisions as the years passed. Legislatures created new policies

and laws for the expansion of vocational education as various needs arose. After World War II, the nation's economy began to change into more of a knowledge-based version which required ever-increasing competencies and skills in the workplace (Silverberg et al., 2004). Lawmakers then created the Vocational Act of 1973, which was designed for improving educational access and skills development in the United States. The 1973 act was later revised and became the Carl D. Perkins Vocational and Technical Education Act, versions of which are still used today. The Perkins Act has been revised and improved multiple times, with fresh versions being created in 1984, 1990, 1998, and 2006 (Granovski, 2018).

The 1998 Perkins revisions are of interest because they encouraged the development of dual credit programs for lower- and middle-income students and included opportunities for career and technical training (U.S. Department of Education, 2007). The career and technical focus was expanded in 2006 by promoting the development of programs which used competency-based approaches, and students were provided with an opportunity to earn business and industry recognized certifications and credentials (U.S. Department of Education, 2007).

Workforce Opportunities for Career and Technical Education Students

Competition and continued expansion of global trade will continue to increase the demand for skilled trades and occupations for the foreseeable future (U.S. Bureau of Labor Statistics, 2013). These global driving forces have produced the need for a workforce that is highly skilled, capable of continual learning, and adaptable to emerging technological advances. The Lumina Foundation (2016) found that the increased use of secondary and post-secondary educational partnerships was being driven by economic factors, employer credentialing requirements, and changes in global competitive advantage. Contrast that with the work of Haveman and Smeeding (2006), who found that future employment opportunities in the United

States were negatively affected by the continued decline in postsecondary attainment and completion rates.

Legislatures across the United States have sought out solutions to improve both the educational attainment rates and the supply of highly skilled workers through a variety of means. One approach has been placing greater emphasis on opportunities provided by community colleges to provide affordable, applicable, and accessible education and workforce development (Lumina Foundation, 2016). Dual credit collaboration among secondary schools and community colleges provides potential solutions to employer and workforce needs. The opportunity for academic success, credential attainment, and program completion is increased because of program design and academic delivery methodology. Links between the theoretical foundations of various subject matter is coupled with a greater use of practical hands-on applications and objectives in these programs (Unruh & Mayo, 2011).

Indiana and other states across the middle United States have attracted new business and industry in recent decades through a variety of means, often by promoting a strong and well-prepared workforce. The continued strength of the economy in recent years has not only increased demand for a wide variety of goods and services that these companies are producing but also increased demand for skilled employees (Vargas, 2014). Sustaining these economic gains will require continued improvements in postsecondary completion rates, earning of recognized credentials, strengthening of dual credit partnerships, and lessening of the number of learners who fail to complete (Lumina Foundation, 2016; Vargas, 2014). Economic productivity is directly connected to postsecondary attainment; in order to maintain sustained economic growth, the success rates for those seeking postsecondary credentials must continue to improve (Bottoms & Squires, 2017).

Sundell and Shaughnessy (2017) proposed that demand for dual credit career and technical education programs will continue to increase. The high schools that sponsor these programs have the potential to contribute to the economic engines of their communities in significant ways, if the quality of the programs remains high. Barnett and Stamm (2010) strengthened this position by pointing out that large numbers of high school students are already interested in technology and associated career paths; thus, the programs are more likely to succeed.

Student Success in Dual Credit Programs

The enhancement of dual credit programs over the course of the past few decades across the United States has been the result of a variety of approaches to reducing the obstacles students often encounter. Researchers and policymakers alike have sought out a means of identifying these obstacles prior to student entry into dual credit programs (Watson, 2000). Administrators of dual credit programs have experimented with a variety of inventive approaches with the goal of increasing overall student success, but creative and imaginative programs alone do not guarantee student success (Kuh et al., 2010).

In the book *Student Success in College: Creating Conditions That Matter,* the authors examined 20 diverse colleges and universities for policies and approaches to increasing student academic and programmatic success. The authors described six common characteristics found at these collegiate environments which foster a cultural approach to improving student outcomes (Kuh et al., 2010). The six cultural characteristics include: (a) concentrated focus on student learning, (b) clear pathways for student success, (c) a continuous-improvement mentality, (d) a system of educational enrichment built into the environment, (e) a shared accountability for program excellence and student accomplishment, and (f) a *living* mission and philosophy. The

authors described the overall effectiveness of the examined academic cultures to be the result of the six factors co-mingling rather than operating independently. The combinations of policies and approaches to create the dynamic cultural characteristics varied as individual program needs were recognized and addressed (Kuh et al., 2010).

CHAPTER 3

METHODOLOGY

Purpose

Through this research project, I sought to discover the shared program attributes, administrative approaches, and instructional strategies which most effectively contributed to student academic success and dual credit program completion. I sought to increase the understanding of how career center directors view their roles in the process, and how they contribute their talents towards educational quality and student success. Lastly, I sought to increase our understanding of how career center practices ensure their collegiate partners' policies and learning objectives are followed, mirrored, and incorporated into the programs.

Setting

This study was conducted using one-on-one interviews with Indiana career center directors. Digital video conferencing technology was employed, as the onset of Covid-19 and the resulting social restrictions prevented on-site visits. Sets of standardized, open-ended questions, and using interview protocols were employed. The Indiana Department of Education website was used as a resource for research participant selection. Multiple career and technical education centers were identified for possible study across the state. All of the selected career centers partner with high schools who serve multiple communities in offering dual credit opportunities in a variety of career and technical training programs.

Rationale for Qualitative Research

In the pursuit of qualitative research, the researcher serves as the key instrument. The central focus of qualitative research is to observe and contemplate a particular social state of affairs, event, role, group, or interaction (Locke et al., 1987). In this research project, qualitative research was suitable for describing the attributes and characteristics of the dual credit programs. Qualitative research was also well suited to provide useful insight into the perspectives and viewpoints of the participants. A project using the case study strategy offered the researcher the opportunity to advance the understanding about the characteristics of a particular phenomenon or experience. In this case, the factors that contributed to student academic success was the phenomenon of interest. Data were collected through interviews using video conferencing technology with career center directors.

Creswell (2009) offered criteria for qualitative research: First, qualitative researchers begin with a single concept or phenomenon on which to focus. As the research progresses, multiple features and characteristics will emerge that potentially affect the phenomenon of interest, potentially branching the study into greater complexity. Second, qualitative studies use research questions rather than specific objectives; the lack of specificity distinguishes the study from quantitative types. Third, a central, broad question is determined as an area of primary inquiry, and secondary, associated questions then arise from it. When using a qualitative research approach, a set of characteristics or factors which surround the central phenomenon are explored. The viewpoints and perspectives of the research participants are studied and presented (Creswell, 2009).

Research Questions

The following research questions guided this investigation:

1. What are the administrative strategies of Indiana career center directors that contribute to the academic success of career and technical students participating in dual credit programs?
2. What are the dual credit program attributes that contribute to the academic success of career and technical education students in Indiana?
3. How do Indiana career center directors describe effective instructional practices of career and technical teachers?

Director Survey Questions

These sub-questions were presented to the career center directors. The questions served to answer the guiding research questions by examining perspectives on program effectiveness, instructional techniques, leadership strategies, and limitations that hinder program potential.

1. Describe how you create strategic goals and a shared vision for student success.
2. How does your organization promote collaboration among and between students, staff, and the community?
3. How does your organization monitor and support teacher effectiveness?
4. How do students typically demonstrate competency or mastery of a skillset?
5. What percentage of students complete the career and technical programs at your facility?
6. What approaches do instructors use to create a culture of achievement?
7. How do instructors promote student engagement?
8. What techniques do you utilize to solicit feedback and communication from stakeholders? (Instructors, students, parents, community members)

9. How do you ensure that the career and technical objectives taught in the various programs are aligned with those of the sponsoring college?
10. Describe the equipment or program limitations which restrict program scope or capability.

Limitations

In any research project, there are limitations which the researcher could not control. The participants in this study were from five career centers offering career and technical dual credit education to high school students in the state of Indiana, and did not necessarily represent similar groups across the United States. The research was conducted over the course of a few weeks, which was not enough time to examine all instructor and program attributes which potentially contribute to student academic success. Additional time to devote to the research could potentially generate additional insight.

The study relied upon the accuracy of information gathered during one-on-one interviews with research participants, additional information from follow-up interviews, upon responses to interview transcript checking, and upon supplemental notes taken during the interview process. The study did not include student perspectives on program effectiveness.

Delimitations

This research focused on the program characteristics and instructional aspects of career and technical dual credit programs with an emphasis on exploring effective academic techniques which might potentially be used for continuous improvement in future programs.

Sampling Approach

Merriam (2009) described purposeful sampling as “a technique whereby the researcher selects a sampling of people who can inform the researcher with the necessary data in pursuing

the discovery of solutions to the research questions" (p. 61). Purposeful sampling was utilized in this research to choose the research sites and individuals of interest in order to answer the research questions.

The criteria used for purposeful sampling was to first select Indiana career centers which offered dual credit courses to high school students from multiple communities and whose concentration involves career and technical education. Career center information was first gathered using the Indiana Department of Education database. Next, the directors of these career centers were contacted and asked to participate in the research. Upon agreement, arrangements were made for personal interviews to be administered and completed.

Validation of the Study

This research project employed two validation approaches to safeguard the credibility of the findings (Stake, 1995). The first was research participant checking, where the participants were given the opportunity to provide additional feedback on the interview questions and transcripts. The second was researcher observations and notes taken during interviews. These validation components were combined to lend accuracy and reliability to the research outcomes.

Research participant checking allowed for the external verification of the accurateness and integrity of data obtained by allowing the interview transcript to be reviewed by the research participants (Stake, 1995). For this approach, the research participants were allowed to review their interview transcripts and were given the opportunity to provide feedback and reflections. This technique strengthened the accuracy and validity of the interview data obtained.

Researcher observations allowed for supplemental data to be gathered by taking field notes on the behavior and activities of individuals at the research sites and on characteristics of the teaching and learning facilities as described by the participants. For this approach, an

observational protocol was used to note the actions and conduct of the research participants (Creswell, 2009). Data collection methods included researcher field notes and observations, documents provided by research participants during and after the interview process, and interview recordings.

Triangulation allowed for "comparing and cross-checking through observations at different times, in different places, or by interviewing research participants with different perspectives, or from follow-up interviews with the same people" (Merriam, 2009, p. 216). For the triangulation approach, follow-up interviews as well as fact-checking by the participants through transcript reviews were employed. Additionally, career center sites at different geographical locations throughout Indiana were included in this research project.

Confidentiality

Any information that was obtained in connection with this research project and that could potentially be identified with either the interviewees or their respective career centers will remain confidential and will be disclosed only with interviewee permission or as required by law. Personal and career center identities were not essential in conducting this research project. Neither the interviewees nor their associated career centers were identified in the research documentation. Instead, a coding process using pseudonyms assigned to the participants and their career centers was used. All research materials are stored on secured digital memory devices, in a secure location, with access limited to the principal investigator and faculty sponsor.

Summary

A qualitative study was conducted to find solutions for the three general research questions. Proposed procedures for the investigation were described. Focused interview

questions were posed to Indiana career center directors to examine their perspectives on program characteristics, administrative strategies, and instructional techniques which have demonstrated effectiveness in student academic success. The study was limited to selected dual credit career and technical education programs in Indiana. The study shall protect and safeguard all participant and research site-specific identities. The study revealed common characteristics across multiple programs that have produced positive academic results for participating students. Chapter 4 will present an analysis of the results of the research project. Chapter 5 will provide a discussion of the discoveries.

CHAPTER 4

FINDINGS

The purpose of this study was to examine three areas of interest related to the academic success of career and technical students participating in dual credit programs in Indiana career centers. A sample of Indiana career center directors were interviewed to identify specific programmatic, managerial, and instructional attributes which potentially contribute to student academic success. The research questions which guided this study were:

1. What are the administrative strategies of Indiana career center directors which contribute to the academic success of career and technical students participating in dual credit programs? (RQ1)
2. What are the dual credit program attributes that contribute to the academic success of career and technical education students in Indiana? (RQ2)
3. How do Indiana career center directors describe effective instructional practices of career and technical teachers? (RQ3)

Data for this research study were gathered from five in-depth, semi-structured interviews and follow-up interviews, conducted over a 15-week period, notes and observations gathered during the interviews, and through transcript-checking with the participants. All participants were career center directors with 10 to 24 years of educational experience. Career centers from the southern, central, and northern regions of Indiana were selected and interviewed. The selection of sites in different geographical locations in Indiana contributed to the validity of the research project (Creswell, 2009). Five directors participated in the research study. On site visits

to each career center were originally planned as part of the research process, but the onset of Covid 19 during the research time frame prevented any such visits.

Appointments for the individual interviews were scheduled with each participant via e-mail or telephone. After an initial weak response, a second round of e-mail invitations was sent with greater success. Many of the career center directors had very full schedules during the week, and a few days to a week's notice was typically required to accommodate the research interview request. Each career center was assigned a randomly generated letter alphabetic code for strict confidentiality of identity. The participants were given a pseudonym to protect their anonymity.

The length of the interviews ranged from 37 minutes to 77 minutes. All interviews were digitally recorded and transcribed verbatim. After each interview transcription, I carefully listened to the recordings a second time in their entirety. Supplemental notes were recorded in a journal in order to capture key ideas and interesting points. These notes were then used to complement the initial coding process.

Data were initially coded using a thematic analysis approach, focusing on key terms and phrases which related to each of the research questions. In qualitative research, a code is usually a single word, or short series of words that gives a meaning or an attribute to a portion of the data (Creswell, 2009). This process resulted in 27 individual codes derived from the participants' statements, which were then carefully studied and examined for initial categories. The codes were then repeatedly reviewed in an ongoing process with frequent reflection on the collected data. This resulted in reducing duplicates or those codes which were very closely related. Similar codes were then combined under a single category heading. Table 1 displays samples of the initial codes which were developed from the participants' statements.

Table 1

Initial Codes Developed from Research Participant Statements

Initial Code	Participant Statement
Teacher preparation	Our career center employees do not answer to a high school schedule, so common prep times are possible.
Funding sources	The state, through Perkins 5, has implemented a comprehensive local needs assessment.
Collegiate objectives for dual credit classes	We make sure that the syllabus is mirrored, even going as far to use a common one made by a third-party. We want to ensure the rigor.
CTE (career and technical education) is "cool now"	For so many years we were the "other" kids. The ones that were not smart enough, the ones that should not be going to college. We make every effort not to fit those old stereotypes.
Cross collaboration	So, if construction is doing a project, it could be related to what horticulture is doing.
Career center structure	You do not have control of the quality of the programming, necessarily, when it is outside of your building.
Teacher focus	When a teacher has a good plan, good instruction, good applied applications, real world learning experiences, that keeps kids engaged.

After the initial codes were developed, an additional round of categorization and sorting was administered. Persistent reflection and review of the data continued as this process was carried out. During this secondary effort, codes that were linked in logical ways were grouped together into smaller units. Then the codes were studied and selected according to their application towards answering the research questions. As this process progressed, certain central themes began to emerge. After the collections of codes were sorted and categorized into themes, they were again examined to evaluate their applicability to the research questions. The themes that emerged are the answers to the research questions (Creswell, 2009).

Pseudonyms and Research Participant Confidentiality

A standard practice in educational research is to develop a system of pseudonyms for the purpose of maintaining the confidentiality and to protect the identities of the research participants. For this research project, the Indiana career center titles were arranged in alphabetical order, then a corresponding set of letters from the English alphabet were randomly generated and paired with each career center title. Care was taken to ensure that the selected pseudonyms in no way reflected the actual titles of the career centers. All career center directors were assigned a pseudonym name, while all career centers were assigned the two-letter designator of "CC". Using this methodology, a career center title might have a randomly generated pseudonym of "CCBSB". Table 2 illustrates the pseudonyms used for the research participants in this study.

Table 2

System of Pseudonyms Used in this Research Project

General Geographical Location	Career Center Pseudonym	Director Pseudonym
Southern Indiana	CCAIP	Aiden
Northern Indiana	CCBLT	Tatum
Central Indiana	CCMIB	Journey
Southern Indiana	CCMVM	Presley
Central Indiana	CCTLP	Quinn

The Career Centers

CCMVM is situated in southern Indiana and serves a total of five counties. When asked to describe the career center and program characteristics, Presley shared,

> We offer 20 areas of study in career and technical education for both college and career pathways. Dual credit, industry certifications, and internships are all in the mix. Our center is centrally located in the five counties we serve. Since we are a career center and not a traditional high school we operate much differently. The majority of our instructors are from industry. We have a few traditional teachers, who went through traditional education schools. We work together, both sides, as we focus on our strategic goals. We use our advisory boards made up of people from industry or sector of business. We listen to them quite a bit about the needs in our area, the changes that are occurring, and it helps us to strategically set our goals and vision.

CCBLT is located in northern Indiana, serves ten high schools, and two counties. When asked to describe the career center and program characteristics, Tatum explained,

> We have 30 areas of study in career and technical education allowing our students to start on their college transcript while still in high school, pursue apprenticeships with business or industry partners or prepare for transition into the workforce. I was previously at another career center. I started here recently.

CCBLT provided a unique perspective comparing a stand-alone career center to one having multiple locations.

> I have ten high schools now, instead of seven. I'm kind of in a superintendent's role, where I am not responsible for day-to-day single building operation, whereas before I was. When things are outside of your building, you must rely on administrators who may

> or may not have CTE (career and technical education) experiences or expertise. With multiple high schools, administrators from each location tend to focus on the needs and objectives for their own schools, without considering the needs of others. Our high schools here are really far apart geographically, and there are four large anchor high schools with 2,000 students or more each. The biggest difference here is that you don't have control over the size, scope, and quality of the programming. I had an assistant in my previous position, which allowed me to get out quite a bit, but here it's very difficult.

CCTLP is located in central Indiana and is a stand-alone career center.

When asked to describe the career center and program characteristics, Quinn shared,

> We have been here since 1972. We currently offer 27 half-day programs for junior and senior high school students. We have about 1300 students, and since we are a stand-alone unit we are basically our own school district. We have our own school board; we have our own policies. On the one hand I act as the executive director, on the other hand I also act as the CTE director. There are five stand-alone facilities, like ours, in the state and we are similar in size and scope. Our CCTPL employees do not answer to a high school schedule, so common work times and project times are possible. We take full advantage of that. However, with the onset of COVID-19, we can no longer get together in groups and are down to the basics. Let's have school, do what we have to do, then get out of the building.

CCAIP is a career center located in southern Indiana. When asked to share a bit about the center and the program characteristics, Aiden stated,

> Our career center serves 21 high schools with 25 different career and technical programs. Most of the programs are designated by the state as high-wage, high-demand careers.

> Most of our students earn around six college credits per academic year, and they earn a pile of state licenses and certifications; if memory serves me, we awarded more than 1,200 credentials last year. Our teachers typically have many years of industry experience within the career area they teach in. We like to think we are the best equipped career center in the state of Indiana, and we are constantly updating the training equipment and technology in order to keep up. We do our best, but sometimes it's a challenge. We focus on work-based learning activities, internships when we can arrange them, job shadowing, and other things like that. Most of our programs operate more or less like a business, and the students run the business with guidance and directives from the instructors.

CCMIB is located in central Indiana and is physically situated inside a school corporation. The center provides programming for two high schools in the immediate area. When asked for a general description and program characteristics of the career center, CCMIB replied,

> Our facility is structured a bit differently, as all my programming is inside two high schools. One of the high schools has a wing which is more CTE, so it's very concentrated. The other high school is more of an open concept, and CTE programming is scattered throughout. I am in charge of all one-hour programming and I oversee project lead the way (PLTW) programming. I also have the multi-hour programming for subjects like culinary arts and early childhood education. We have 45 staff members and we typically serve around 2,700 students with pathways for college as well as careers, which is a requirement now.

Administrative Strategies

When asked about administrative strategies, the directors discussed multiple aspects of their programs. Presley described the administrative strategies used at CCMVM.

The state requires certain training and preparation for our teachers. It more or less hits the basics, but it does not go into depth. Our corporation has new teacher orientation, as well as regular professional development, but we do it differently on our side, because we look so different from a traditional high school. We set up teacher professional learning communities. We thought: How can we support these folks? So, we set up learning communities where we rely on the most experienced teachers to go through lessons on discipline, student management, dual credits, and the like. It's really worked well for us, and I think the teachers appreciate feeling those connections. We also provide our new instructors with a mentor, someone within their area of instruction who they can go to with whatever problem they might have. One of the things we have focused on is cross-curricular work, where you might have engineering, industrial maintenance, and precision machining partnering. What project can they work on together where they develop the design, do the processing, and then produce the outcome of it? We are interested in the cross-curricular aspects of the whole process. How can we get these kids working together?

Tatum described the administrative strategies used at CCBLT.

I am very much a teams-based administrator. Your buy-in with staff helps you in leaps and bounds with regards to trying to get things accomplished. It's important to educate your teachers on our mission, vision, and goals. I want to make sure they understand the performance indicators, and some of that will drive our strategies. I used to use the old SWOT analysis, and have the staff go through things. But now that I am wiser, I use the SOAR analysis, which is strengths, opportunities, aspirations, and results. All the parts are positive. I also focus on our vision and have everyone consider if we are comfortable

with our vision. If we are not, what do we need to change? Are we changing it to meet the needs of society? Of business and industry? I've had much success with that approach, working with teachers to develop our strategic plans. I do a series of listening tours with my superintendents, their teams, guidance counselors, in an effort to find out what their goals are and to build some common objectives. We also look at the performance indicators we must meet, and we have to align with what our high schools are doing, otherwise they will not send students to us. You have to take the time to explain to the various high school admin teams what we are doing and why.

Journey described the administrative strategies used at CCMIB.

I am very fortunate to have stepped in behind two great leaders. We developed our curriculum and we did it as a team. That was before there was a lot of state guidance. Things have changed a bit since I started in this role, we've had several teachers move on, and I wonder how do we keep that culture going? I can tell you that we always strive to be the very best we can be. Any given day, any given time, what's the best that we can be? So, we ended up doing a study and a survey with our CTE staff. We discovered that we didn't have the best relationships with each other, that we didn't have the best relationships with our community partners, and that we did have great relationships with our students but how do we make them stronger? We are housed in multiple buildings, times are all different, we cannot have lunch together, we cannot all get together like the stand-alone systems. But we do have a faculty meeting once per month, and I have worked on some activities which allow the teachers to get to know each other, we have some generational differences so there was some disconnect. So, we have really concentrated on what does the professional relationship look like?

Aiden described the administrative strategies used at CCAIP.

We have our school improvement plans and we look at performance measures and how we are going to be held accountable. We have what we call core indicators of performance. Many of our administrative strategies are focused on improving our core indicators. We also very much believe in professional learning communities (PLC). We work hard at those, and we focus on results and we create a culture of collaboration. We take the core indicators, the PLC, and the culture of collaboration and we really focus on these. We have what we call "purposeful redundancy." We use all of these to drive our actions. But the most important thing is the purposeful redundancy; whatever it is we must be very intentional about what we do. We have, in our organization, a common plan time. At high schools, that's difficult to do, but here everyone is on the same schedule, so we have a common plan time every day. Our teachers and staff benefit from our ability to work together each week, which will have a positive impact on their teaching methods. But, we must also remember that every kid is different, one size does not fit all kids, and a teaching method that works for some students, may not work for others.

Quinn described the administrative strategies used at CCTLP.

We have created and run what we call "focus teams" and we all meet twice per month, before COVID 19, that is. Each focus team has a certain type of goal. The goals might be curriculum based, facility based, or school improvement based. Our team members choose a certain topic they feel strongly about. The real focus is on continuous improvement. In my current position, I no longer go into the classrooms for evaluations. But, when I used to do that I looked for what types and kinds of learning was happening when I walked through the door. I would ask the students about the day, and I want to see

> the students articulate that. What is happening not only today, but in the bigger picture. Do they understand why they are learning these things? Does it make sense to the students why they are learning this and how it might help them in the future? Once the students realize the connection or the reason behind it, they are going to be much more engaged and involved.

Advisory Boards

A universal collaborative component which guided and directed administrative strategies for all research participants interviewed proved to be their advisory boards. Advisory boards are composed of individuals who have expertise and experience in the workforce areas that the CTE program serves. These boards are essential partners and are universally considered to be an invaluable component of the overall program structure. They serve to guide the educational decision-making process on strategy, development, implementation, assessment, maintenance, and modification of CTE programs in Indiana. They serve to communicate the employment and training needs of local business and industry. The career center directors interviewed for this research project emphasized the importance and necessity of active, engaged, and connected advisory boards. As Tatum stated: “Sometimes we do a lot of networking outside our walls to be able to provide assets to the programs. I am a very big believer that active advisory committees can help get much of that done.”

Quinn commented on advisory boards.

> Every program has an advisory board, made up of members who are in the various career areas, professionals, or folks who have an interest. This is required by Perkins legislation, so we actually have hundreds of community partners who work with us; they help guide us, support us, and give us direction helping us move forward. We actually put into our

teacher evaluation system that if you want to be highly effective, you must meet with your advisory boards four times per year. As a result, many of our teachers have those meetings four times per year. Our community collaboration always involves each program having advisory boards, made up of members of the community with expertise or interests in certain areas. So, we actually have hundreds of partners who work with us; they help guide us, support us, and give us direction to go forward. Collaboration with our advisory boards is critical to our overall success.

Presley commented on advisory boards.

The state, through Perkins 5, has implemented comprehensive local needs assessment that pulls in parents, students, industry, post-secondary, and high schools. It really pulls in a group across the board. This is really now our advisory board, renewed every two years. We ask them: Do you think we are going in the right direction? What do we need to do to better the career center? Are we providing programs that are relevant? We then align our strategic goals and vision to what these folks think the community needs.

Tatum commented on advisory boards.

I have had to do a lot of networking outside to be able to obtain equipment and special supplies, for things like culinary arts, etc. I am a firm believer that our advisory boards can help get a lot of that done. I have relied heavily on that. It takes a couple of years to get teachers to understand how valuable advisory boards can be. You typically have a handful of teachers who do a super job of that. Your building trades teachers rely very heavily on that.

Journey commented on advisory boards.

We are required to have advisory boards, and we work with them to help develop our

curriculum. You might have a class called “Intro to Manufacturing”, but what does that really mean? We work with our advisories and a few teachers to develop it. We have had a good pathway here because of the strong focus on quality from my predecessors.

Aiden commented on advisory boards.

It is vital that we share our vision and goals with our community partners and our advisory boards. Also, we must have long term plans for all our programs. If you don’t, you’re going to struggle because you can’t do it on the fly. Without a long-term plan two things are going to happen, you’re not going to be able to (be) compliant for those dual credits and you’re not going to be reflective of what business and industry needs. Our advisory boards help us to stay current, which then helps us to get our students workforce ready.

Instructional Techniques, School Climate, and Culture

Presley commented on instructional techniques, school climate, and culture:

A lot of our folks are from industry because they have the background, they know those kinds of jobs and the opportunities we have in our area. They have had the hands-on experiences in the real world, and they bring that into play in our classrooms. They create cultures of learning and pass on those skills. Our teachers use a wide variety of teaching techniques, taking advantage of the collective efforts of our training and their fellow instructors and professional development, and their life-long experiences. All of our programs have dual credits. We sign agreements with the universities. They will come in and evaluate our curriculum. We then try to ensure the alignment with our curricula with theirs. These partnerships sort of guide the instruction, the climate, and our culture.

Tatum commented on instructional techniques, school climate, and culture:

I am a firm believer in including both the students and their parents in developing our school culture, which has a direct effect on how the teachers end up presenting their lessons and how they engage their students. We often leave the parents out of things during a student's junior and senior year. When a teacher says they want to do something in their classroom, they want to try a new technique or teaching approach, and a parent might have something to assist, I encourage that. The parents want their child to benefit from the efforts. There is a lot of leverage that could be had there. In every school I have worked at, I have created a student mentor program. I've always met with the mentors and asked them if they are satisfied with what they are getting here at the career center, what we might change, or improve. Also, I always look at the students cross-collaborating between subjects. So, if construction is doing a project, it could be relative to what horticulture is doing, or what another subject area is doing. Fire Science, Criminology, and Health always worked together at my previous career center. Collaborations along those lines helps the students in the long run to learn about teamwork. These ideas have always been a passion of mine; I want my teachers to become better at what they do because if they become better, I become better. I welcome being critiqued myself, and I do not ask teachers to do anything I would not do.

Journey comments on instructional techniques, school climate, and culture:

We typically do not use our meeting times for meetings; it's all about professional development. We are intentional the whole time. It's always tied to building relationships. We want to focus on how we are giving opportunities to our students. What does that look like? That also means we are holding our students accountable. All these efforts go into improving our teacher's effectiveness, so I guess you would say that

impacts their teaching techniques. The other thing I do is allow anyone to critique me and share their thoughts on the direction we are going. On instruction, I am very interested in how my teachers are connecting with other departments and subjects. Are we teaching a bit of English and math in welding and nursing? How are we ensuring our students understand the professional skills needed in today's workplace? How do we engage our students? How do we present better lessons? If this kid's home life is not good, how do we support her or him? We are always looking for instructors who are passionate about getting the next generation the knowledge, but we are not perfect, we don't have it nailed down just yet. We tell the teachers we expect hard work, loyalty, and a commitment to your students. I think that our instruction is improved through these kinds of efforts. Let's try an approach or a technique that another teacher has had success with and let's see how it goes in another subject.

CCAIP commented on instructional techniques, school climate, and culture:

Back in the day it used to be that teachers would just take the students out to the shop and work, with no real lesson plans or organization. They would work with whatever came in the door. It wasn't so much about curriculum or covering standards. Some of the teachers would focus on their techniques, and how effective they were, while others never gave it much thought. All that has changed for the better. Now, through professional development we constantly work with our teachers to help them grasp what it means to be a professional teacher, what it means to teach an effective lesson that makes a lasting impact on those students. Our teachers must understand what a good quality lesson looks like, and they have to present it in a way that keeps their students engaged and thinking. A healthy CTE program has a good mix of classroom instruction and is supported by a

lab where those lessons can be applied. I think the lab activities and student use of the training equipment associated with the lessons really supplements the teaching. Students can apply what they have learned in the classroom by using the training equipment. Plus, we have a whole series of lessons based on the training equipment being used, so that supplements the teaching methods. If we don't have great teachers in our programs, we certainly hear about it. We hear from the students; we hear from their parents. Above all else you have to build relationships with kids; if you don't it's very difficult to go any further.

Aiden continued on the subject of instructional techniques and school climate and culture:

We continually focus on our students earning dual credits, and it's an important measure of competency and is reflective of the teaching approaches being used. The course objectives for dual credit classes are clearly written, and those will help guide the teaching methods. Next, we focus on embedding work-based learning experiences within the curriculum. Finally, we find the appropriate level of certifications to match our programs. The number of students earning industry certifications is a great measuring tool. Much of demonstrated competency is based on earning those certifications and is reflective of the teaching methods being used.

Quinn commented on instructional techniques, school climate, and culture:

Because we partner with post-secondary institutions, we have standards and course objectives we must follow. These help craft the teaching modalities and approaches. We align what we are teaching with what the coursework would be from the college. We make sure that the syllabus is mirrored, and we want to demonstrate that we are reaching

> the rigor. The economic development corporation in our community recognizes that we can provide some of the needed training for some of our local businesses and that tends to drive some of the curricula and the teaching techniques. It also helps enrich our school culture because we are partnering with several folks in the community who have a vested interest in our work. We offer mock interview days and career days directly related to our local partners. Some of our students get hired right away, or as they graduate.

Emerging Themes

Administrative Strategies Themes of Relationships, Collaboration, and Partnerships

The interview responses to questions about administrative strategies fell into three emergent themes: relationships, collaboration, and partnerships.

Relationship building and collaboration between all stakeholders including teachers, students, parents, administrators, and community members emerged as an important theme in the administrative strategies for career center directors. The importance of building strong relationships with students was critical to their academic success, but so were the relationships and partnerships with all other stakeholders. While the levels of parental and community partnerships, as described by their respective directors, varied from career center to career center, all emphasized the need for collaborative efforts outside the confines of the classrooms and labs.

When asked about their administrative strategies for ensuring learning objective alignment between their CTE facilities and those of the sponsoring college, the career center directors shared their collaborative approaches. Tatum stated,

> The course coordinator from the college sends us a copy of the syllabi. They have typically told us to take it, tweak it, change the necessary info, send it back to us and we're good. We are going through the motions, but we need to be in alignment.

Presley shared, “We have 21 programs, all with dual credits. We’ve signed MOU’s (memorandums of understanding) with large and small universities. They come in, evaluate our curriculum, make sure that it aligns with theirs.” Quinn described the career center’s course objective alignment efforts as, “We work with the department chairs who provide the standards, and we align what we are teaching with the coursework from the college. We make sure the syllabus is mirrored. We are showing that we are reaching the rigor.” Aiden shared, “We are looking at the post-secondary degree and certificate programs and content, and we are mapping it down to the high schools. The goal is 100% alignment.”

The career center directors shared that professional learning communities and focus teams are collaboration approaches that are used to ensure that students are taught using innovative and engaging methods, with a focus on active learning. The attention is shifted from teaching to the learning and making sure that all students have an opportunity to learn. Presley stated,

> We do professional development a little different in our center, we set up a new teacher professional learning community and we reply on the most experienced teachers to run through lessons on discipline, student management, dual credits, and that sort of thing. It has really worked out well for us.

A general collaborative theme that emerged from the participating career center directors was their belief in the importance of cross-collaboration between different academic departments as an effective academic strategy. Using this technique, students have the opportunity to learn about the importance of teamwork and begin to make some connections between subject areas. Presley commented,

> How can we get these kids working together? We’ll take the kids in engineering over to

> precision machine, or we'll take them over to welding. Then we challenge them by saying: Now, you've got to make this whole process work. We are really trying to make connections between classes.

Cross-collaboration between curricular departments created an opportunity where students can observe how the work and focus in one curricular area relates to and affects those in another. A project which is designed in one department might be constructed and assembled in another, and the final product might be marketed and distributed through yet another. The cross-collaboration model encouraged students and instructors to partner in all aspects of the project, from its origins to its final destination. The idea was that it supplemented the teaching and learning for all those involved. The directors shared that the collaboration model is reflective of research, development, prototyping, construction, distribution, and marketing in real-world applications and is a valuable strategy for use in their programs. Aiden shared,

> Many of our goals are focused on increasing our performance indicators. To do this we work hard within our groups to create cultures of collaboration. We have 25 high schools so the opportunities to work together are pretty good. We encourage cross-collaboration between departments and between schools in some cases because we know it works well.

Organizational Structure, State Curricular Pathways, and Federal Funding

The interview responses to questions about program attributes fell into three general themes: organizational structure (stand-alone vs. multiple locations), state curricular pathways, and federal funding (Perkins dollars). It was evident at the very early stages of this research project that the stand-alone facilities, where all teachers, programs, and educational assets were housed in a single location, had an advantage for collective teacher planning and training. Stand-alone organizational structure provided regular opportunities for all instructors to plan and work

together as one large group, or in smaller related groups. Weekly or monthly meetings enabled all team members to share best practices, develop strategies for student success, promote mentoring and collaboration, address common problems or challenges, and collectively express needs for improvement. All departments using the collective planning approach had the opportunity to be on the same page.

The career centers with multiple locations could not take advantage of this collective planning time. The directors shared that they did utilize other techniques to promote peer to peer collaboration, but the stand-alone centers had a distinct advantage. Multiple high school schedules, differing bus schedules, and the inability for career center directors physically to be in many locations on a regular basis hindered control over some aspects of management. Career centers organized for and serving multiple school corporations and administrative teams at physically distanced locations had differing levels of CTE knowledge and understanding. The career center directors shared that some of their administrators had little to no CTE experiences, yet they were managing CTE programs. Tatum shared,

> When the programs are outside of your building, at other locations, you have to rely on other administrative teams; some may not be career and technical education experts. The other leadership teams may not see things the way you do, and often times they just think about their own school's needs. Plus, when you try to meet with all your teachers for planning or professional development, it becomes a real challenge.

Another emergent programmatic characteristic that emerged from all the participating career center directors was state-wide core curriculum. The State of Indiana provided specific curricular schedules and plans for completion. These were referred to as pathways and required career and technical programs to provide students with pre-determined course sequences from

secondary to postsecondary education and into high-skills, high-demand career opportunities. In some cases, these pathways start at the middle-school level involving a broad-based, general career exploration experience. The career center directors shared that the state-wide curriculum, which provided course sequences and academic benchmarks for all similar dual credit programs throughout the entire state of Indiana did indeed contribute to student and programmatic success. Tatum stated:

> The state now has these guided career pathways which are basically structured sets of courses that build upon each other to develop technical and academic skills. Sometimes the pathways end with an industry certification or credential of some sort. Sometimes our students use the pathways to get a jump-start for a 2 year or 4-year degree.

Career center directors expressed a general appreciation for the pathways, as they provide clear and focused curricular maps and chronological sequencing for CTE courses and programs. In the past, these state directives did not exist, and career centers developed their own approaches and curricular designs. Now, the pathways are standardized and have been designed and organized using multiple collaborative efforts from many stakeholders. Business and industry certifications, in many areas of study, served as benchmarks to programmatic and educational success. All career centers interviewed incorporated industry certifications into their coursework and course objectives as a result of the state requirements. Quinn emphasized this:

> These types of milestones allow our graduates to demonstrate their level of knowledge and skill to potential employers, although to be honest some employers don't care so much about it. They don't mind if the kid has the certification, but they are going to evaluate them again if they are considering a job offer.

The kinds and types of industry certifications varied with geographical location, and with

local employer needs. Business and industry certifications served an essential role in the increasingly knowledge-based economy, where specific skills and experiences are in high demand (Indiana Department of Education, 2018). Certifications offered a variety of potential benefits for those who sought employment, as well as for the potential employers. Certifications served as an educational benchmark validating student competency levels and learned skill sets.

Another universal programmatic attribute which was expressed by all the research participants was the vital importance of Perkins funding. The Federal Perkins Act provides funding sources for career and technical programs and is central to enabling career centers to purchase state-of-the-art equipment and training materials. The career center directors shared that many CTE programs were rather expensive to run, and the needed equipment was often far outside of the average programmatic budget. Perkins dollars allowed career centers to purchase appropriate training equipment in order to deliver training associated with business and industry certifications, as well as other applicable teaching and learning experiences. Perkins guidelines required career and technical education programs to connect strategically their program outcomes to the education and skill sets needed by local employers. A local needs assessment was required by the latest version of the Perkins Act. Determining local needs helped direct the decision making for training equipment and asset purchases. Without Perkins funding, the ability of career centers to stay current with technological trends and emerging developments was described as severely disadvantaged. Quinn stated,

> When it comes to our ability to purchase training equipment, there are always limitations. We get funding through the Perkins grant, but it's a challenge to keep up with what is needed. When it comes to technology, or software, or equipment, you just try to do your best. But, our Perkins dollars are critical to our success; without it, I don't know how we

could possibly buy what is needed for our programs.

Aiden commented, “So, you make a long-term plan and you seek every grant opportunity you can. In our world, we live a lot on Perkins funding; without these opportunities we would struggle to keep our programs current.”

Emerging Themes from Instructional Techniques

The interview responses to questions about effective instructional techniques fell into three general categories: cross-subject connections, professional development, and planning structure.

Cross-Subjects Connections

All the career center directors interviewed shared their belief that student success and motivation is improved by using cross-subject connections and cooperative instructional techniques. Creative use of these techniques encouraged and promoted improved teacher effectiveness by supplementing the internal motivation for continued improvement. Collaboration and teamwork were described as vital and fundamental to instructional success by the directors. Quinn shared,

> Once our students and the teachers realize the importance of these cross-subject connections, they are going to be much more engaged and involved. Do the students and teachers understand not only what is going on today, but do they recognize the bigger picture?

Professional Development and Planning Structures

The directors shared that to the greatest degree possible, every meeting they held with their instructors focused on some sort of professional development or continuous improvement effort. The overall aim was to increase the effectiveness of the teaching and to culture teacher passion. These types of improvement efforts also went beyond the team meetings and included

mentoring partnerships, teamwork with other instructors, collaborative planning, and cross-subject connections. The directors shared that work-based teaching and learning, sometimes outside the confines of the career centers, also served as effective instructional techniques. Job shadowing, internships, and business-based program structures were described as effective as well. Journey stated,

> We are lucky here because my predecessor had a strong focus on teacher effectiveness, quality, and he worked a great deal with local employers to ensure our students had work-based learning opportunities, sometimes paid internships. I can show you dozens of success stories there.

Tatum shared,

> We learned about the idea of developing a student-ran [*sic*] business several years ago. Every kid would have some responsibility. We had a challenge in matching some of our curriculum, but in the end the team worked it out. The instructors realized that they should let the students run the entire business; it taught them about entrepreneurship and a range of other things.

Summary

The career center directors shared that teachers who are passionate and internally driven toward continuous improvement increase their own effectiveness as well as that of others. They described teacher passion as contagious. Students made stronger connections with motivated teachers, and benefited from the passion and focus demonstrated in the classrooms and labs. The career center directors believe the best way to improve educational outcomes is to encourage and foster teacher passion and effectiveness. As Tatum stated, “You can’t have effective instruction without motivated and passionate teachers, good lessons, and good planning”.

CHAPTER 5

DISCUSSION, IMPLICATIONS, AND CONCLUSIONS

The purpose of this basic qualitative study was to study the program characteristics, administrative approaches, and instructional techniques being used in Indiana career centers serving dual credit career and technical students. Chapter 5 encompasses the conclusion of the research study by examining the study findings as a whole and how the discoveries relate to the current literature on career and technical programs in Indiana. Chapter 5 will also include a discussion on the study's implications for practice, and recommendations for future research in dual credit programs in career and technical education.

Summary of the Results

Policymakers and educators firmly believe that dual credit programs and experiences constitute one of the best methods to prepare students for both college and career pathways (Tobolowsky & Allen, 2016). Employers in Indiana are looking for workers who have the needed technical skills who can also be productive without a steep learning curve (Hall & Rogers, 2014). The career and technical education centers are challenged with the responsibility of delivering programs and training that will meet both post-secondary educational rigor and the demands of the 21st century workplace (Harvey et al., 2019).

The modern workplace has undergone many changes over the course of several decades, and the rate of change continues to increase (Hall & Rogers, 2014). As technology grows increasingly more sophisticated, and as employers incorporate greater levels of applicable technology into their business models and industrial workplaces, the need for highly skilled employees who can problem solve and use critical thinking skills continues to grow (Lumina

Foundation, 2016).

Indiana career centers are addressing the various student, program, and workforce needs for both college and career pathways through a vigorous statewide preparation program linking rigorous academic experiences with the technical skills required by Indiana's workforce leaders. Indiana CTE programs are governed by both state and federal laws. Federal funding from the Carl D. Perkins Act is tied to annual student performance. This design is intended to encourage CTE leaders to continuously improve both the programs and student success rates (Indiana Department of Education, 2018). It is noted that all the career center directors interviewed expressed their appreciation for Perkins funding which enables them to maintain an inventory of relevant training equipment that is reflective of current, or nearly current, business and industry trends. The career center directors shared that without this funding source, staying current with technological developments would be very difficult indeed.

Discussion of Findings

This qualitative study provided insight into the perspectives of Indiana career center directors on program attributes, administrative strategies, and instructional techniques which contribute to the academic success of participating students. Social and academic integration, a sense of belonging, recognizing the value of the curriculum, support systems, teaching approaches that engage, and facilities that are conducive to learning are all part of Tinto's model (Tinto, 1975).

Findings for Research Question 1

Research Question 1 investigated the administrative strategies which contributed to the academic success of participating students. The career center directors in this study shared that strong connections with business and industry, student families, active advisory boards, properly

equipped classrooms and labs, continuous improvement in teaching and learning through professional development, and cross-curricular partnerships were all strategies that contributed to program and student success. Guidance from both advisory boards and workforce leaders as to the scope and quality of the curricula, the needed training equipment, and course sequencing contributed to relevant and applicable student experiences and academic success. The availability to use Perkins funding allowed the career centers to provide the students with relevant training equipment, although some directors did express the challenges with trying to stay current with technological changes and advancements. Most directors generally felt blessed with their abilities to purchase current technology, despite the high costs associated with doing so. A teams-based and collaborative approach to management, which aimed to yield significant buy-in from staff members and instructors was found to be a universal administrative strategy in this study.

Utilizing work-based learning partnerships such as internships, job shadowing, and business-based program models as an administrative strategy allowed CTE students to experience teaching and learning in supplemental modalities which generally proved to contribute to student success. The career center directors shared that when students had the opportunity to apply what they had learned in the classroom, while working in the business or industrial facility, it kept them more focused and engaged. An added benefit was that as the programs became more successful, those students currently participating became more successful in the eyes of the career center directors and their instructors. Those successes then tended to contribute to subsequent student successes and the employers welcomed additional work-based training.

Some of the CTE directors used a strategy where select programs used a business format

for the teaching and learning. Using this model, students managed and operated a business. The students were in charge of many aspects of the day-to-day operations. This business model served as an alternative to internships and job shadowing, when those opportunities were not available, or when the business approach addressed specific needs of the program. Students either provided services or produced a product, and were involved in many aspects of financial accounting, procurement, production, quality, distribution, sales, and service. The career center directors felt that this type of educational model served to strengthen the felt connections, partnerships, and collaborative efforts for all those involved. Students had an opportunity for effective and engaging learning by immersing themselves in various aspects of the business, observing how their decisions had an effect on eventual outcomes. By using critical thinking and problem-solving techniques to work through challenges as they emerge, students became more proficient at select skills and abilities.

The career center directors shared that stronger connections with student parents and guardians were desired. When parents and their teachers work together to support and improve the teaching and learning, the whole system tends to work better.

As Journey stated:

> I used to joke that we need to get the soccer moms involved in this project, because as soon as you do they will start pushing for success. I think many parents have realized the real benefits of career and technical education. So, in addition to our advisory boards, how do we get the parents and community members involved in promoting our programs?

Tatum shared, “The state, through Perkins 5, has implemented comprehensive local needs assessment that pulls in parents, students, post-secondary institutions, industry and high

schools."

Findings for Research Question 2

Research question 2 examined the dual credit program attributes. Organizational structure, state of Indiana guided pathways and educational standards, and Federal Perkins funding were the significant findings as related to program attributes.

A fundamental program attribute that reflected core operational parameters for the participating career centers was the organizational structure, i.e., stand-alone versus multiple locations. Two of the directors interviewed operated stand-alone centers, while three operated centers serving up to 25 high schools in various regional localities. Those directors with stand-alone career centers, where all team members were located in the same building, were found to have distinct advantages with regard to communication, team meetings, collective planning times, and professional development opportunities. Communication efforts and the ability to create strong cross-subject collaborations were simplified with a single location. The stand-alone center model allowed for a single management style whereas multiple locations required a much different management approach; one that had to address multiple administrative teams with differing philosophies of education. Strategies were needed to address the limitations for communication between high schools situated in different communities and areas. The directors with several site locations had to rely on multiple administrative teams, with differing approaches to the various aspects of day-to-day operations. Stand-alone systems had the advantage of regular, planned, and collective prep times for all instructors. All team members had the opportunity to be on the same page, and the communication activities and directives were able to be simultaneously applied for everyone. Despite their structural differences, both models were described as successful to various degrees. Both structural models were producing skilled

graduates for Indiana employers and capable students who could transition into post-secondary opportunities.

One programmatic attribute of concern, as expressed by the career center directors, for the near future was the future requirements for teacher accreditation. Journey shared,

> I think the biggest issue for the future is teacher accreditation for those teaching your dual credit curriculum. For example, to teach early childhood education after 2022 a teacher will need a Master's degree in childhood education, plus 18 credit hours of related coursework; maybe even some sort of real-world certification. That's a lot to ask of an instructor who will not likely see a significant increase in their compensation with their Master's.

The career center directors shared the importance of the state guided pathways and educational standards as a vital program attribute. Many of the sequenced coursework pathways provided student opportunities for earning business and industry-based certifications which served as milestones recognized by many stakeholders. Certifications served as indicators of proficiency of select skillsets and were based on specific competencies sought by business and industry partners. The business and industry sectors of the economy served as driving forces for portions of the specific sequenced coursework and learning objectives in addition to the types and kinds of training needed. Further, the curricular content and training asset (equipment) requirements were reflected based upon the curricular pathways.

One of the challenges expressed by the career center directors was creating effective learning environments in order to bring under-prepared and under-motivated students up to the required levels of engagement in order for them to be successful enough to complete their guided pathway and earn a certification. A contrasting point of view was shared by the directors in that,

while the state of Indiana has placed a good deal of emphasis on earning certifications, a few of the business partners who work directly with the participating career centers place little importance on them. As Tatum stated, “Some of our partners tells us that it’s okay if a student has an industry certification, but it isn’t all that important to us. We will train them as needed in our organization.”

Findings for Research Question 3

This research question sought to examine instructional techniques which contributed to the academic success of students. The career center directors provided comments on this subject in a general sense, rather than a focused way. Some of the directors had been away from actual teaching for several years, instead being focused on administrative duties, and engaging with daily instructional methods only on occasions which required their presence in a classroom or lab. As such, their answers with regards to instructional methods took on a broad-based point of view.

The most significant instructional techniques, as described by the career center directors, were found to be those associated with cross-curricular connections, professional development, and teacher planning structure. The central themes of collaboration, teamwork, partnerships, sharing of best practices, and continuous improvement, in one form or another, emerged from the research project as the interview transcripts were repletely reviewed and scrutinized. Follow-up interviews and researcher notes supported this finding.

Cross-curricular connections occurred when two or more teachers and their students collaborated to work on certain projects or objectives. Career center directors described this instructional technique as effective because it enabled students to immerse themselves in a teams-based environment with all the associated benefits, challenges, and relevance to the

workplace environment, to which many of the students were headed. Students had the opportunity to make connections on a broader array of applications and to apply skills and techniques learned in one subject, to those of another.

Teacher planning structure emerged as an important technique contributing to student academic success. Those career centers which are located in a single physical location, benefitted from the ability to have collective professional development and preparation times for all team members, and communication techniques were simplified. Career centers serving school districts in multiple locations were unable to benefit from the single all-inclusive collective planning model.

Professional development and continuous improvement emerged as a third major contributor to effective teaching and learning techniques. The career center directors shared that regular and focused teacher support, through continued training and development served to improve learning outcomes generally. While there were some variations from instructor to instructor, the overall effects of good professional development, and a genuine focus on continuous improvement as a system-wide approach netted positive effects of teaching techniques and learning outcomes for student. Professional development also included peer-to-peer mentoring, coaching and feedback, and an emphasis on the team mentality.

Implications for Improved Practice

The study suggested that Indiana career center directors who oversee dual credit programming were instrumental in implementing policies and educational practices which contributed to the academic success of participating students. Further, it suggested that career center directors served as primary advocates for system-wide continuous improvement. But, their degrees of control over administrative strategies for professional development, lesson plan times,

and other activities related to program improvement varied based on the organizational structure. An interesting organizational characteristic began to arise early in the research project in reference to how Indiana career centers operating with multiple locations faced different administrative and organizational challenges in comparison to their single-site counterparts. The career center directors shared their belief that all-inclusive planning and professional development times enjoyed by single-site career centers were advantageous and did contribute to student academic success. As Journey commented, "We have the ability to meet every single week as a large group. All our teachers have the opportunity to be on the same page."

It is recommended that multiple-site career center directors work towards implementation of recurring, dedicated, carefully designed, and synchronized planning, and professional development opportunities where either all of their faculty and staff participate, or where selected groups of faculty members meet based on subject matter taught and cross-curricular relationships. Teachers working with career centers serving multiple localities and areas should be given the opportunity to collaborate and partner with each other in innovative ways in order to enjoy the benefits expressed and experienced by their single-site counterparts. Considering the current and evolving state of technology related to web-based video conferencing, team meetings, and information sharing, this is entirely within the realm of possibility. The greatest challenge likely lies in balancing the various needs, and leadership approaches of multiple administrative teams in different localities.

To start this process, it is recommended that an action plan be implemented in order to determine the feasibility for multi-school cooperative planning times and/or professional development. A central focus of these efforts should be to encourage the increased use of these planning and improvement opportunities to drive continuous improvement for all divisions of the

career and technical centers, across all participating high schools. The challenges of determining the ideal days and times for large-group activities will be one of the primary problems to solve, given that some of the participating career centers serve up to 25 high schools. All administrative teams should coordinate in order to offer at least yearly large-group professional development opportunities to examine and share best practices, emerging instructional techniques, innovative technological applications, diversity and inclusion, and activities aimed at encouraging continued partnerships. Twice yearly, or quarterly large-group team meetings would likely increase the benefits and drive the continuous improvement efforts with greater effectiveness.

Based on the findings of this study, administrators, educators, and policymakers must place a high priority on a teams-based approach to organization and relationship building among stakeholders. Wherever possible, collective teacher planning and collaboration should be encouraged in order to foster a common vision and collective plan for continuous improvement for dual credit programs. Collective plan times create opportunities for all participants to benefit from group thinking. Given the current status of communication and digital technology, collective plan times are within the realm of possibility for any school system, regardless of location or structure.

The creation of reating greater numbers of opportunities for parental and guardian involvement in CTE education is advised. The career center directors shared that, generally speaking, parents and guardians tend to reduce their involvement in the educational experiences of their students as they progress into the high school years. Parental support, stable home environments, and socio-economic status are good predictors of academic success. The educational structure, as it exists in the United States today, has yet to create a universal system design that can address all the social, emotional, environmental, economic, and experiential

needs of all students despite their life experiences and social standing. But, the collaborative activities, partnerships, and cross-curricular experiences, as described by the career center directors, serve as an instrument through which the educational playing fields are to some degree equalized for everyone.

To the greatest degree possible, CTE dual credit courses offered in the high school setting should be of the same rigor and quality as that of the sponsoring college. The career center directors shared a few methods by which their faculty and staff work with collegiate representatives to ensure alignment of their dual credit course objectives. Annual collegiate visits to the career centers, mirrored syllabi, collegiate sponsored professional development, and memoranda of understanding between the sponsoring colleges and the secondary educational institutions were all described as efforts toward ensuring the quality and rigor of the dual credit programs. However, in order to improve the delivery and implementation of post-secondary rigor and quality continuously, stronger connections and working relationships between the secondary and post-secondary institutions are recommended. One good example of a limiting factor in this regard is the physical distance between some of the participating high schools and their sponsoring colleges; this makes it quite a challenge for collegiate representatives to visit regularly and observe the modes of delivery and teaching techniques employed by dual credit instructors. Given the large investment the state of Indiana is making in dual credit and associated teaching and learning, and the significant importance that properly delivered training serves to Indiana employers, annual visits by college personnel to dual credit programs is not enough.

It is recommended that the career centers, their partnering high schools, and their collegiate counterparts collaborate more closely together to implement practices that ensure post-

secondary courses offered in dual credit programs are of the same rigor and quality as those of the sponsoring colleges. This can largely be digitized with today's applicable technologies, but regular in-person visits by college representatives to observe teaching methods, student activities, and the physical characteristics of the classrooms, labs, and associated training equipment are advised.

The participating career center directors expressed some concerns and limiting factors in regard to the future of dual credit programming. Chief among these are the more stringent degree requirements that secondary dual credit instructors will soon have to meet. Beginning in September 2023, high school teachers in Indiana who teach dual credit courses will be required to hold Master's degrees and have earned at least 18 credit hours of instruction in the subjects they teach. While advanced degrees do yield instructors with greater expertise and content knowledge, many school systems no longer have reimbursement policies or programs to help the instructors offset the significant costs associated with obtaining Master's degrees. Further, most school systems no longer offer salary increases when instructors have completed their advanced degree work; thus, there is little monetary incentive for secondary teachers to pursue and earn an advanced degree. The career center directors did share that at least one major college in Indiana was offering tuition-free advanced coursework specifically for dual credit instructors in the state. This will help offset the tuition costs, but it does not address the expressed need for salary increases that should come with advanced degree completions. In short, it will help address some of the problems, but it will not solve all of them. The career center directors believed they will see several of their instructors leave the profession and pursue other careers because of the new requirements.

It is recommended that Indiana career centers strengthen their collaborative partnerships

with sponsoring colleges in order to ensure that all participating dual credit students have the same access to identical learning experiences, academic expectations, and the same associated resources as those of their collegiate counterparts. The current incorporation of business and industry certifications as milestones in many dual credit courses serves as a means to achieve this goal, but that does not go far enough. Ideally, dual credit students should have access to the same support services, academic advising, and counseling as college students. The college should also ensure that dual credit students have the same training assets and equipment, which provide the same functional capabilities and the same levels of complexity for problem solving and critical thinking skills. The partnership should ensure that the same grading standards are used at both secondary and post-secondary levels. Finally, the sponsoring college should provide and conduct the final exams or evaluation activities in order to guarantee equal and equitable measurement of student mastery.

Recommendations for Continued Research

Future studies should broaden the scope of participants and research methods related to factors that contribute to the academic success of career and technical students. Future studies should include programs that include students who are dual-enrolled at a partnering college versus those participating in dual credit. This approach to participant selection would be used in order to broaden the scope of research. This study used a qualitative interview-based methodology. Future studies should be conducted using quantitative or mixed-methods research to provide measured and correlational information on variables that contribute to student academic success.

A more in-depth research project could be conducted focused on one of the research questions using a larger participant pool. A quantitative study examining career center director

administrative strategies, program attributes, and instructional techniques would potentially yield complimentary results to this qualitative study. A study examining how career center directors divide their time on a daily basis as compared to the size and scope of their respective programs could potentially yield insight into methods for continued improvement.

Summary

Student engagement and felt connections both inside and outside the classroom are critical to academic success and are the result of good planning, teaching, and program design. Programs should be designed so that students can acclimate themselves both academically and socially, and experience a feeling of belonging (Tinto, 1993). While social aspects of education have been a part of the process from the very beginning, they have not always received the attention to detail that is now apparent to educators and researchers. While schools cannot solve all the social problems of American society which affect student achievement and academic success, they can work at bettering the experiences of students to the greatest degree possible. A more holistic approach to career and technical education is called for.

Effective career and technical education is vital to Indiana's continued economic growth and the prosperity and well-being of the workforce and their families. This research project sought to examine factors which affect student academic success in dual credit, career, and technical education programs in Indiana, where students prepare and train to enter the workforce or transition into more advanced education. A qualitative study was selected as the most appropriate methodology to answer the research questions. Structured interviews were conducted with select career and technical center directors who oversee dual credit programs in southern, central, and northern regions of Indiana. A detailed thematic analysis was then conducted which resulted in the following emergent themes: collaboration, partnerships, relationships,

(administrative strategies); organizational structure, state curricular pathways, Perkins funding, (program attributes); and planning structure, professional development, cross-subject connections (instructional techniques). The professional experiences and managerial approaches used by the career center directors were reflected in the emergent themes.

The research project results reveal important implications for career and technical education in Indiana. The career and technical educational delivery system, as it functioned during the research project, was composed of many inter-dependent sectors, but all of them had very similar objectives. The more closely each inter-dependent sector partnered with the other sectors, the stronger the partnerships, the greater the resulting student academic success. Certain challenges in collaboration existed in the participating career centers, which were compounded for those centers operating in multiple locations. However, current and emerging technology has the potential to reduce the challenges by allowing stronger collaborations between school systems separated by distance.

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APPENDIX A: INDIANA CODE--DUAL CREDIT

IC 21-43 ARTICLE 43. DUAL ENROLLMENT; COLLEGE CREDIT EARNED BY HIGH SCHOOL STUDENTS; TECHNICAL CERTIFICATES OF ACHIEVEMENT

IC 21-43-1 Chapter 1. General Provisions; Definitions

IC 21-43-1-1 Applicability

Sec. 1. The definitions in this chapter apply throughout this article.
[2007 Higher Education Recodification Citation: New.]

As added by P.L.2-2007, SEC.284.

IC 21-43-1-2 "Core transfer library"

Sec. 2. "Core transfer library" has the meaning set forth in IC 21-42-1-3.
[2007 Higher Education Recodification Citation: New.]
As added by P.L.2-2007, SEC.284.

IC 21-43-1-2.5 "Dual credit course"

Sec. 2.5. "Dual credit course" means a course taught by a high school faculty member, a college faculty member, or a college adjunct faculty member that a high school student may take to earn both high school and college credits. Dual credit courses may include any of the following:

(1) A concurrent enrollment college course that is taught:
(A) in a high school classroom;
(B) by a regular high school faculty member who is approved by an eligible institution; and
(C) to high school students who earn high school credit for the course and may also earn college credit through an agreement between an eligible institution and a school corporation under IC 21-43-4-3.5.

(2) An on-campus course, that:
(A) is taught:
(i) on the campus of an eligible institution;
(ii) by a faculty member of the eligible institution; and
(iii) as a regular course offering to postsecondary students attending the eligible institution in which a high school student enrolls and attends; and
(B) is approved by the high school that the high school student attends for secondary credit requirements.

(3) A college course that is taught:
(A) in a high school classroom;
(B) by a faculty member of an eligible institution; and
(C) to high school students who may earn both secondary and postsecondary credits.

(4) An online college course, that:
(A) is taught:
(i) by a faculty member of an eligible institution; and
(ii) as a regular course offering to postsecondary students attending the

eligible institution in which a high school student enrolls and attends; and (B) is approved by the high school that the high school student attends for secondary credit requirements.

As added by P.L.125-2013, SEC.4.

IC 21-43-1-2.7 "Early college"

Sec. 2.7. "Early college" means an academic program consisting of a series of dual credit courses or concurrent enrollment courses, or both, which allow high school students to earn both a high school diploma and:

(1) an associate degree that has been approved by the commission for higher education;

or

(2) up to two (2) years of academic credit toward a baccalaureate degree.

As added by P.L.125-2013, SEC.5.

IC 21-43-1-3 "Eligible institution"

Sec. 3. "Eligible institution", for purposes of IC 21-43-4, means an accredited public or private:

(1) college; or

(2) university;

located in Indiana that grants a baccalaureate or an associate degree and offers postsecondary enrollment opportunities.

[Pre-2007 Higher Education Recodification Citation: 20-30-11-1.]

As added by P.L.2-2007, SEC.284. Amended by P.L.125-2013, SEC.6.

IC 21-43-1-4 "High school diploma"

Sec. 4. As used in this chapter, "high school diploma", for purposes of IC 21-43-8, refers to a high school diploma earned under IC 21-43-8.

[2007 Higher Education Recodification Citation: New.]

As added by P.L.2-2007, SEC.284. Amended by P.L.7-2011, SEC.16; P.L.125-2013, SEC.7.

IC 21-43-1-5 "Postsecondary credit"

Sec. 5. "Postsecondary credit" means credit toward:

(1) an associate degree;

(2) a baccalaureate degree; or

(3) a career and technical education certification;

that is granted by an eligible institution upon the successful completion of a course taken in a high school setting under a postsecondary enrollment

opportunity established under this article.

[Pre-2007 Higher Education Recodification Citation: 20-30-11.5-1.]

As added by P.L.2-2007, SEC.284. Amended by P.L.234-2007, SEC.111; P.L.229-2011, SEC.243; P.L.125-2013, SEC.8.

IC 21-43-1-5.2 "Postsecondary enrollment opportunity"

Sec. 5.2. "Postsecondary enrollment opportunity", for purposes of IC 21-43-4, refers to programs established under IC 21-43-4, including dual credit courses, concurrent enrollment courses, and early college programs.

As added by P.L.125-2013, SEC.9.

IC 21-43-1-5.5 "Priority dual credit course"

Sec. 5.5. "Priority dual credit course" refers to a course of study for postsecondary credit that the commission designates as a priority dual credit course under IC 21-43-1.5-1.

As added by P.L.229-2011, SEC.244.

IC 21-43-1-9 "Secondary credit"

Sec. 9. "Secondary credit" means credit toward graduation requirements granted by a student's school corporation upon the successful completion of a course taken under a postsecondary enrollment opportunity established under IC 21-43-4.

[Pre-2007 Higher Education Recodification Citations: 20-30-11-3; 20-30-11.5-3.]

As added by P.L.2-2007, SEC.284. Amended by P.L.125-2013, SEC.11.

APPENDIX B: INDIANA COMMISSION FOR HIGHER EDUCATION

DUAL CREDIT POLICY

Policy on Dual Credit Opportunities in Indiana

Adopted February 12, 2010

Preamble

The State of Indiana regards the offering of rigorous dual credit courses as means for expanding access to postsecondary opportunities, encouraging students to pursue higher education, and increasing college completion rates.

For the purposes of this policy, dual credit courses are defined as courses taken by high school students that satisfy requirements for earning credits toward both a high school diploma and a college degree. Dual credit courses are taught by regular high school faculty or by regular or adjunct college faculty.

The principles outlined on the pages that follow are designed to promote greater clarity, quality, consistency, transparency and transferability of dual credit opportunities for the benefit of Hoosier students.

Basic Conditions

All dual credit courses shall meet the following conditions:

1) Postsecondary campuses shall take appropriate steps to ensure that dual credit courses are of identical quality and rigor to qualify for college credit; in this regard, postsecondary dual credit programs shall embody the following characteristics:

a) All secondary students taking dual credit courses shall meet the same academic prerequisites for taking those courses as apply to students taking the same courses on the postsecondary campus; beyond that, the secondary school and the postsecondary campus may jointly establish additional criteria for determining how students are selected into dual credit courses;

b) Course syllabi used for dual credit courses in liberal arts, professional, and career/ technical disciplines shall be identical to course syllabi used in the same courses taught on the

postsecondary campus, including class assignments, laboratory experiments, examinations; and textbooks shall be comparable;

c) Student learning outcomes expected for dual credit courses in liberal arts, professional, and career/technical disciplines shall be the same as student learning outcomes expected for the same courses taught on the postsecondary campus;

d) An academic unit on the postsecondary campus shall be responsible for monitoring, throughout the school year, the delivery and quality of dual credit instruction; such monitoring shall include visits to the secondary class;

e) The secondary school and academic unit on the postsecondary campus shall work together to identify instructors of dual credit courses based on criteria established by the postsecondary institution. The postsecondary campus shall approve the individuals who will teach the dual credit courses in the secondary school, but the school corporation shall be responsible for hiring and compensating these personnel;

f) Approved instructors of dual credit courses shall have credentials consistent with the credentials required for on-campus faculty or a development plan approved by the postsecondary institution to satisfy this requirement;

g) The academic unit on the postsecondary campus shall be responsible for ensuring that professional development opportunities are available and communicated to secondary faculty, who are teaching dual credit courses;

h) The postsecondary campus shall establish a mechanism for evaluating and documenting, on a regular basis, the performance of students, who complete dual credit courses; and

2) Postsecondary institutions shall generate transcripts for all students who enroll in dual credit courses.

3) All postsecondary institutions and campuses offering dual credit courses in liberal arts, professional, or career-technical disciplines shall:

a) Maintain compliance with the Commission for Higher Education's (CHE) dual credit policy;

b) Demonstrate adherence to the standards advocated by the National Alliance of Concurrent Enrollment Partnerships to the satisfaction of CHE;

c) Demonstrate ongoing adherence to this policy and NACEP standards by submitting to CHE the results from regular self-audits;

d) Be subject to state reviews conducted on a periodic (and as-needed) basis by a standing subcommittee of CHE's Statewide Transfer and Articulation Committee (STAC).

4) Since a dual credit course in a liberal art, professional, or career/technical discipline is deemed to be academically equivalent to the same course taught on-campus by the institution offering the course (see #1 above), the dual credit course shall, consistent with the transfer policies developed by CHE's Statewide Transfer and Articulation Committee (STAC):

a) Apply toward meeting the degree requirements of the institution offering the course, in the same way as the on-campus course; and

b) Transfer to the other public postsecondary institutions in the state, in the same way as the on campus course.

5) Wherever possible, the course syllabi for dual credit courses in the liberal arts shall also prepare students for successfully passing Advanced Placement (AP) examinations in the same academic area.

6) The Commission for Higher Education, Department of Education and the postsecondary institutions, shall ensure greater statewide consistency and transparency of the corresponding exam scores students must demonstrate in order to earn college credit for Advanced Placement and International Baccalaureate coursework.

7) The Commission for Higher Education, in partnership with the Department of Education, postsecondary institutions and local school corporations, shall prioritize state funding, expand accessibility, and build instructional capacity for student dual credit, Advanced Placement and International Baccalaureate opportunities in the following 10 core subject areas: American Government, American History, Biology, Calculus, Chemistry, Economics, English Composition, Physics, Psychology and World Languages.

APPENDIX C: DIRECTOR AND ASSISTANT DIRECTOR SURVEY QUESTIONS

Perspective, Program Effectiveness, Instructional Techniques, and Leadership Strategies

1. Describe how you create strategic goals and a shared vision for student success.
2. How does your organization promote collaboration among and between students, staff, and the community?
3. How does your organization monitor and support teacher effectiveness?
4. How do students typically demonstrate competency and/or mastery of a skillset?
5. What percentage of students complete the career and technical programs at your facility?
6. What approaches do instructors use to create a culture of achievement?
7. How do instructors promote student engagement?
8. What techniques do you utilize to solicit feedback and communication from stakeholders? (Instructors, students, parents, community members, etc.)
9. How do you ensure that the career and technical objectives taught in the various programs are aligned with those of the sponsoring college?
10. Describe the equipment or program limitations which restrict program scope or capability.

APPENDIX D:

INITIAL SET OF CODES DEVELOPED FROM DIRECTOR INTERVIEWS

RQ1	RQ2	RQ3
Program Attributes	Administrative Strategies	Instructional Techniques
Stand-alone vs. multiple locations	Advisory boards	Quality
State directives	Relationships	Collective vs. separate prep times
CTE is cool now – views are shifting	Professional development	Cross-subject connections
Certifications	Professional Learning Communities	Passion
Teacher accreditation	Collaboration	Collaborative teaching
Blessed with equipment	Partnerships	Effectiveness
Perkins (funding)	Teams-based management	Engagement
CTE is different	Common vision for all	Felt connections between teachers
Performance indicators	Dual credit offered vs. dual credit earned	
High school doesn't always know CTE	Focus Teams	
Completion rates	Post-secondary education vs. opportunities	