PROFILE OF SECONDARY PROGRAM COMPLETERS AT REDBUD TECHNOLOGY CENTER

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INTRODUCTION

Background

Eisen, Jasinowski, and Kleinert (2005) from the Deloitte Development LLC. conducted a survey of the American Manufacturing Workforce for the National Association of Manufacturers (NAM). The survey's purpose was to gather information from the employers about their workforce. The findings from the executive summary were:

1. Today's skill shortages are extremely broad and deep, cutting across industry sectors and impacting more than 80 percent of companies surveyed;
2. Skills shortages are having a widespread impact on manufacturers' abilities to achieve production levels, increase productivity, and meet customer demands; and
3. High-performance workforce requirements have significantly increased as a result of the skills gap shortage and the challenge of competing in a global economy, according to nearly 75 percent of survey respondents (p. 3).

Therefore, in this rapidly changing world, business and industry need to have employees with high performance capabilities for today's jobs, and who are ready to face the challenges of the future demand of the workforce. This is a necessity if business and industry will be able to compete in this era of globalization.

Numerous terms are used for Occupational Education such as Workforce Education, and Career and Technical Education. For this study, the term of Career and Technical Education will be used.

Since occupational education is most often the "supplier" of the workforce, the expectation of a high performance workforce—now, and in the future—termed by some employers as the "global workforce," is borne on the shoulders of occupational education and occupational educators. Consequently, Career and Technical Education (CTE) is required to "produce" graduates who match the demands of business and industry, now and in the future.

In the 21st century, education and economic opportunities are tied together. Salary differences indicate that education beyond high school is crucial to earn a middle class income. Susan Sclafani (n.d.), Assistant Secretary, Office of Vocational and Adult Education, United States Department of Education, states that the fastest growing jobs in America require some education beyond high school. Furthermore, she states that

> men with one year of post-secondary Career and Technical Education courses had an eight percent (8%) income difference compared with men who graduated from high school. Women with a post-secondary Career and Technical Education

certificate had a sixteen percent (16%) income difference compared with women who graduated from high school (p. 3).

According to the O*NET website (2007) there are distinct job zones from job zone one through zone five, progressively more skilled as moving closer to zone five. Job zones two and three usually require a minimum of training in a vocational school and earn an income that can support a family of four. Thus, career and technical schools such as Redbud Technology Center (RTC) play important roles in preparing individuals to enter the workforce in job zones two and three. Students at career and technical schools, including RTC, have varied goals. Many look for technical certificates or associates degrees that will help them obtain good jobs with decent salaries. Some might want to improve their skills to have a better job or to reach a higher position in the workplace, while others might simply want to change their career path.

Keller (1953) states that:

> Genuine vocational education is a comprehensively conceived and fully integrated preparation of every individual American, according to his peculiar interests, aptitudes, and abilities, for a full life in all its phases (p. 6).

Therefore, technical schools such as RTC have as their goal to prepare students for gainful employment in this rapidly changing world. The end product of RTC is to prepare workers who are competent in their specialized area.

Career and Technical Education (CTE)

According to California Industrial and Technology Education Association Foundation (CITEA, 2006), CTE constitutes "organized educational programs offering sequences of

courses directly related to preparing individuals for employment in current or emerging occupations requiring other than a baccalaureate or advanced degree" (p. 1). K-12 CTE has two main components:

1. Exploratory and foundation studies for grade 6 through 9, called *Technology Education.*
2. Career specific studies for grade 10 through 12, designed and concentrated in vocational skills.

The need for CTE

There are many arguments from numerous scholars who think that CTE programs are indeed needed by high school students. According to California State Senate (2005) CTE is "designed to prepare students for entry into the workforce and higher education" (p. 1).

Although 75 percent of high school students state that they will go to college after graduation, in reality only half of them go to college and, even worse, only half of college students will actually finish school. In its 2005 report, the California State Senate mentions that the disconnect between aspirations of students to go to college and their achievements is due to these students' lack of preparation to go to college and/or their later realization that they do not need a college degree to obtain good jobs. Also, the California State Senate quotes from the Bureau Labor of Statistic (BLS) statements that through 2012, there will be 56 million job openings of which 75 percent do not require a bachelor's degree. Three hundred fifty occupations will be open to high school graduates with certain additional skills in areas such as manufacturing, food industries, health care services, etc. with higher than average income earnings. In addition, Plank (2001) states

that high school students who take both academic courses and CTE courses are more likely to become workers after they finish high school than are students who concentrate on purely academic courses. The need exists for high school students to take both academic and CTE courses. Furthermore, Welch (1988) stresses the importance of CTE programs for high school students. He opposes the ideas of some critics who disregard vocational education in high school. His argument is that not all students are college bound, so educators should not force them into an academic mold which could cause them to become frustrated and drop out of high school. Some students prefer to learn a vocational skill and enter the working world after graduation.

The benefits of CTE

Besides fulfilling the demands of business and industry by supplying them with skillful workers, CTE also benefits students by way of facilitating their familiarity with and awareness of the career pathway ahead of them. It provides opportunities for students to gain relevant, skilful, and hands-on experience. Other benefits of CTE for secondary students are presented by Riggs (2007). He summarizes a study by Oklahoma State University Center for Applied Economic Research which shows that the average salary for Oklahoma workers ages 18 and over who have only high school diplomas is $14.36/hour compared to high school workers who also have CTE certificates who earn an average of $16.60/hour. Not only is the starting salary for high school graduates with CTE certificates higher, it also increases faster than that of workers with high school diplomas only. This study also discovers that high school graduates who were taking CTE programs earn a salary 12% higher than high school graduates who were taking academic courses only after they graduate. Other benefits for CTE concentration for high

school graduates are that they are more likely to become professionals and/or managers as compared to academic high school graduates. Also, at the workplace, CTE concentrated high school graduates have better health-care benefits, and--in life--most of them do not require public benefits as often as academic high school graduates.

The concerns

A concern exists about whether or not CTE students can score well on standardized tests in core academic subjects. The concern is whether high school students who take both academic courses and CTE courses will score lower on standardized tests in core academic subjects such as mathematics, science, reading, or history than students who took only academic courses (Plank, 2001). This concern has been proven not valid. Another concern he has is that both academic and CTE teachers should effectively work together in their instruction in order to prepare students to be able to link academic subjects and career applications.

The strength of CTE

The strengths of CTE have been stated by many scholars, school administrators, and government representatives. For example, Denver Public Schools Career and Technical Education Business Advisory Board (2005) has cited the influence of CTE on high school students. They state that there is a positive correlation between students' involvement in CTE courses and their scores in mathematics, reading, and writing. Involvement in CTE programs increases students' attendance, grade point averages, and graduation rates as well. As a final point, CTE programs for secondary students give opportunities for high school graduates to choose their own career pathway, to have better job opportunities, to earn higher incomes, as well as decreasing the dropout rate.

Meanwhile, the following types of experiences have been listed as strategies to help dropout rates by Association for Career and Technical Education (ACTE, n.d.): systemic renewal, safe learning environments, family engagement, early childhood education, early literacy development, mentoring/tutoring, service-learning, alternative schooling, after-school opportunities, professional development, active learning, educational technology, individualized instruction, and CTE. Since CTE offers a larger selection of courses to high school students and avails them practical experiences, it helps students to identify pathways to success and encourage their continuance on these pathways. The report also mentions that the combination of academic courses and CTE courses lowers the dropout rate of high school students.

The funding

In order to be able to offer many programs, CTE receives funding from federal, state, and local levels. In the Oklahoma CareerTech report (2008), the revenue for Oklahoma CareerTech in 2007 came from federal, state, local, and other. 5.1 percent of the total revenue came from federal funding: $24,264,278. 31 percent came from state funding; $146,620,018. 62.5 percent came from local funding; $296,179,218. 1.4 percent was revolved funding from the year before; $6,606,769. Also, the report shows how the funding was divided. Technology centers received 64.1 percent; $113,100,242. Agencies received 15.3 percent; $27,095,058. Comprehensive schools received 15.2 percent; $26,765,405. Skill centers received 4.3 percent; $7,603,820. Colleges received 1.1 percent; $1,886,692.

Delivery System of RTC

The delivery system for RTC uses a similar delivery system as that of the state. The Oklahoma Career and Technical Education is using Oklahoma Career Clusters framework as a basis to design its delivery system (CareerTech, 2005). Oklahoma Career Clusters framework is designed based on National Career Clusters with adjustments to meet the needs of business and industry in Oklahoma. Thus, it allows RTC to offer short term programs and serve full time students as well in all areas of the delivery system, and it prepares "all students for challenging technical training, rigorous academics, and life-long career preparation" (p. 2). Also, this design increases RTC's capabilities to meet business and industry expectations for a high-skilled workforce. Ultimately, the RTC delivery system is designed to be "industry-focused, student-centered, and performance driven" (p. 2).

As a typical technical school in the United States, RTC has open admission policies, meaning that the school accepts all incoming students who have the desire to learn and can benefit from a technical education. High school students are required to submit their PLAN scores, even though no minimum score is required. RTC offers short-term classes and full-time career programs (RTC, 2001). The short-term classes are online courses (6 week programs), certification packages, and customized training for business and industry. The full-time programs are a one-year and a two-year program. Twenty-four full-time programs are offered by RTC which have both high school and adult students:

- Air Conditioning/Refrigeration

- Automotive Technology
- Biotechnology
- Business Technology
- CNC Machining
- Certified Massage Therapy
- Collision Repair Technology
- Cosmetology
- Culinary Arts
- Drafting
- Electrical Technology
- Health Careers
- Health Informatics Technology
- Information Technology
- Machine Tool
- Manufacturing Technology
- Masonry
- Pharmacy Technician
- Practical Nursing
- Precision Metal Fabrication
- Pre-Engineering Technology
- Radiologic Technology
- Residential/Commercial Construction
- Welding

Process of student enrollment

RTC accepts secondary students from 12 sending high schools from the surrounding area. RTC generally accepts 9^{th} -12^{th} graders as secondary students in its programs. RTC counselors visit high schools and do a personal interview with students during the month of February. The counselor looks at the Prepare Learn ACT Now (PLAN) test scores of individual and discuss with the student her/his plans for after high school. Students were asked to complete a 2 page form with personal information and 6 essay questions. The questions are as follow:

1. What program do you want to enroll in at RTC? Why?
2. How do you plan to use the training you receive at RTC?
3. What are your plans after high school?
4. Have you had any work experience, classes or other experiences that relate to your desired program and career?
5. What do you like to do in your free time (outside of school)?
6. If there is not room in the program you want, do you have a second choice? Why would you choose that program?

Based on these answers, the counselor and the student discuss her/his interest and future plans. Students who do not have a chance to discuss their PLAN test scores and interests face-to-face send their written information (PLAN test scores and written interview), and those students enroll after mid-March. Then, the counselors will review students' information. If the counselors have any concerns about students' choice of program, they conduct a phone interview with the students. Therefore, in the process of choosing a program, the role of the counselors is to make sure that a student chooses a

program that aligns with her/his ability and interest; and the student knows about the careers in her/his future (RTC's counselor, personal communication, April 22, 2008). This process accurately reflects Parson's trait-and-factor theory. PLAN test scores are used to measure the aptitude of students before they choose their career path. WorkKeys is used to match students' capability and work requirements.

Theoretical Framework

Many theories could be used as the framework for this study such as Tinto's theory of student persistence (Tinto, 2002); Holland's theory (Seligman, 2004); Maslow's Hierarchy of Needs (Chapman, 2007); and Parson's trait-and-factor theory (Parsons, 1909 and Chartrand, 1991). Because MTC relies heavily on the PLAN test and WorkKeys both of which attempt to measure traits of students and factors of careers to make program placement decisions, Parson's trait-and-factor theory is the most applicable.

Parsons (1909) devised a career development theory of occupational choice called *trait-and-factor* theory. In his theory, trait refers to a characteristic or feature or attribute of an individual that can be measured through testing. He defines factor in his theory as a characteristic required for successful job performance. He explains that there are traits and factors in every individual that can be assessed through testing such as aptitudes, achievements, interests, values, and personality. He assumes that vocational choice involves an accurate knowledge of self such as aptitudes, personal abilities, ambitions, and limitations; and knowledge of job/occupation such as labor market, requirements and conditions of success, opportunities, compensation, and prospects in different areas of

work; and ability to relate and make a rational and objective judgment to properly match those two areas of knowledge. According to Chartrand (1991), Parsons' basic trait-and-factor theory is that an individual is interested in a job that s/he feels matches her/his own traits. For a counselor to help a student find the right job, first, her/his traits and interests must be measured. Second, job requirements must be observed, and finally, the best match should be found between the first, personality traits, and second, job requirements. To measure the traits and factors, and job requirements, this theory relies heavily on psychometric measures. Parsons believes that humans are capable of making rational decisions. Since individual and environmental differences can be assessed, matching individuals with work environments can be predicted to help increase the likelihood of positive outcomes. The theoretical framework of trait-and-factor theory is an empirically based formula used to match people to jobs, thus, "psychometric instruments can be used to predict relevant criteria" (Chartrand 1991, p. 519). Furthermore, Patton and McMahon (2006) state of the trait-and-factor theory:

> fit approaches emanate out of the logical positivist worldview that relies on measurement and objectives data that is interpreted by an expert who, on that basis, also makes predictions. Trait and factor theory is founded on the notion that individuals are different, and that their different capacities can be measured and related to occupations (p. 22).

In addition, Gray and Herr (1998) suggest the logic of the trait-and-factor approach is that individuals are composed of traits, skills, interests, values, etc. which can be examined and reliably measured. Individuals choose their occupational choices based on cognition and consciousness, not on emotional and psychological aspects. These

beliefs lead to the emphasis that a work situation is a unique place where different skill requirements and characteristics of individuals involved are vital to perform whatever is needed in such situations. The information gathered from these unique work requirements was developed into what we call job analysis, occupational aptitude profiles, etc. Moreover, Gray and Herr (1998) consider the trait-and-factor theory as a matching approach which uses individual traits as predictors, and the degree of traits employed by successful persons in different occupations as the criteria. The matching process of different individuals' traits and different occupational requirements result in the appraisal of individuals' chances of success in the workplace. This notion is the basic foundation of the occupational analysis system and categorization such as is found in the Department of Labor's Dictionary of Occupational Titles (DOT), Occupational Aptitude Profile System, Occupational Outlook Handbook, and other instruments utilized to match individuals and workplaces. Therefore, all of these arguments underlie the use of some aptitude tests in career counseling such as PLAN, KeyTrain, and WorkKeys. PLAN website (2008) mentions that PLAN is "a comprehensive guidance resource that helps students measure their current academic development, explore career/training options, and make plans for the remaining years of high school and post-graduation years" (p.1). Hence, PLAN is a matching process of individuals' traits and occupational requirements. WorkKeys, on the other hand, measures individuals' skills in application and compare/match them with job profiles based on DOT.

Theoretical Perspective

The nature of this study is to discover what factors or characteristics of secondary students contribute to their success as program completers at RTC. The epistemology of

this study, therefore, is objectivism with the theoretical perspective of positivism. Thus, the research methodology is the quantitative method. Using the descriptive method and descriptive statistic analysis, this study will uncover the characteristic factors that contribute to the success of secondary students as program completers at RTC.

Problem Statement

RTC extends enrollment opportunities to everyone and is an option to many students who would otherwise not have access to college. RTC has an open admission policy, and bears the responsibility of producing future graduates as skillful workers. RTC's goal is for all students to graduate and be absorbed into the various business and industry fields as workers with expertise in their areas of specialty.

While RTC gives opportunities for all individuals who want to learn technical skills by having an open admissions policy, this access does not guarantee that the individual will be successful. Among high school students who enrolled in a two year program in 2006, only 77 percent completed the program. The rest are listed as transfers and leavers, never having finished the program (Okcareertech, 2008). With a completion rate of 77 percent, it is crucial for RTC to discover what factors contribute to the success of program completers. It is currently unknown which characteristics are significant, or what impact levels these characteristics hold.

One of the measures of success for CTE is completion and placement rates of program graduates. Numerous sets of data are collected for each student, and each graduate, which have not been systematically analyzed. The need exists to analyze these factors to identify any relationships which might exist. For example, is there a

relationship between gender and successful program completion? The factors which are available to be analyzed are: gender, race, economic disadvantage, sending school, program, grade, attendance, PLAN scores, KeyTrain scores, and WorkKeys scores.

Purpose of the Study

The purpose of this study is to manage and analyze the archived data which would lead to the profile and description of secondary student completers at RTC.

Significance of the Study

The results of this study can be used to observe which factors or characteristics lead to the success of secondary students as program completers at RTC. Additionally, the data could provide input to administrators in making decisions about resources, funding, future student profiles, etc.

Research Objectives

The purpose of this research is to explore which factors or characteristics contribute to the success of secondary students as program completers. Thus, student data such as gender, race, economic disadvantage, sending school, program, grade, attendance, PLAN scores, KeyTrain scores, and WorkKeys scores will be obtained. This data will be analyzed using descriptive analysis and descriptive statistics to discover which factors or characteristics of secondary students contribute to their success as program completers. The findings can be used to describe which factors or

characteristics of secondary students contribute to their success as program completers at RTC.

Research Question

What are the characteristics of a successful program completer for secondary students at RTC for the 2005-2007 school years?

Definition of Key Terms

Program Completer

A secondary student at RTC for the school years 2005-2007 who completed both semesters of a one-year program or four semesters of a two-year program.

Student Characteristics

Student characteristics are identified as gender, race, economic disadvantage, sending schools, program, grade, attendance, PLAN scores, KeyTrain scores, and WorkKeys scores.

CTE

A CTE program/curriculum is a one-year or a two-year program which offers students the opportunity to learn certain skills. It is a workforce preparation program which combines academic knowledge with technical and occupational knowledge. It is an elective course for high school students.

PLAN

PLAN is a pre-test of American College Testing (ACT), given to students in grade 10. PLAN is used as a prediction for the ACT score which is given in grade 11 and

12. It concentrates on improving academic achievement and career preparation. The test is composed of English, mathematics, reading, science. The scores given are in English, mathematics, reading, science, and composite.

KeyTrain

KeyTrain is a curriculum for improving basic skills measured by WorkKeys employment system. It measures the basic skills in applied mathematics, locating information, and reading for information.

WorkKeys

WorkKeys is a job skills employment system which measures real-world skills in the workplace. The skills measures are: applied mathematics, locating information, and reading for information.

CHAPTER II

REVIEW OF LITERATURE

Introduction

Since this study is designed to discover the characteristics of successful program completers for secondary students at Redbud Technology Center (RTC) for the 2005-2007 school years, the literature review presented in this chapter will be in the area of Career and Technical Education (CTE). Therefore, this chapter presents a review of the role of Career and Technical Education (CTE) programs in high school, Oklahoma CareerTech profiles, and the theories of factors or characteristics of secondary students as program completers at RTC. The literature is derived from textbooks, journals, dissertations, and electronic means (internet, webcast).

The main foci of the literature review are:

1. The role of CTE programs for high school students in the areas of standardized tests, future career paths, graduation rate, and careers after graduation.
2. The profile of Oklahoma CareerTech, in general, and RTC specifically.
3. The theory of which factors or characteristics of secondary students possibly facilitate them as program completers at CareerTech.

Literature is abundant concerning factors for high school success when one considers both academic and career tech preparation together. If one were to separate academic and career tech education, literature is limited for specifically career tech. The literature review will provide an overview of the research and theories that do exist and point out possible gaps in the literature. A summarization of the literature review can be found in the conclusion at the end of this chapter.

The influence and role of CTE programs in high school

There are numerous studies about the role and influence of CTE programs in high school. These programs provide students with other alternative courses that stimulate them to learn more; help them with career choice and higher income after graduation; and decrease the dropout rate as well. These studies often present differing pictures.

Plank (2001) examines the effect of mixed academic courses and CTE courses among high school students. One of the findings is that students at risk of dropout who have previous records of low test scores and low GPA's post higher grades in CTE classes. He explains the reasons behind his findings may be that these students feel that academic courses are not relevant to their goals or worldview. Also, there is a possibility that students who achieve low test scores in academic courses are looking for courses that are more personally challenging and in which they are able to achieve higher grades. Meanwhile, Whitlock (2007) presents research at Central Educational Center in Georgia where he found that CTE programs for high school students minimize or reduce absence and tardiness.

Also, Navarro (2007) the Deputy Legislative Secretary to California Governor Schwarzenegger led a discussion with a group of experts on June 1st, 2007 about California Competitiveness through collaboration between high schools and technical schools. The consensus discussion suggests that high school curriculum planners should not perceive CTE programs as offered for underperforming students; instead, CTE programs should be integrated into academic programs. The argument is that CTE courses are related with academic courses which, in turn, give confidence to students to reach higher standards in both types of courses. Another argument is that CTE programs prepare students with skills needed in building careers leading to employment.

In addition, Gray and Herr (2006) state that if high school students at risk of dropout find a program of study with a value that is relevant to them in a place where they feel welcomed, comfortable, and understood by the teacher, they will stay. Gray and Herr (2006) think that CTE programs meet these criteria. This does not mean that students choose CTE programs because they have "a well-thought-out career interest" (p. 50), but more because, in these programs, students are welcomed and valued by the teachers. Furthermore, Gray and Herr (2006) cite research by Harvey who finds that special need students who complete a CTE program are:

> more likely to graduate, more likely to become employed, more likely to be employed in higher paying craft occupations, and more likely to be enrolled in 1- and 2- year college occupational programs than special needs students who do not take CTE (p. 51).

Laura (2007) in AYPF conference mentions that even though 10th grade students in both academic and CTE programs have lower GPA's than students in academic programs, as

they reach higher class levels, the difference in GPA becomes less. In 11th grade, the achievement gap between these two groups of students grows smaller. Students with dual programs improve their performance significantly more than students with academic programs only. Hence, although in 12th grade these dual program students still carry lower GPA's than academic students, the gap is slighter. Similarly, Plank (2001) did a study of the effect of combined CTE curricula and academic curricula in U.S. high schools on student achievement and dropout rate. He looked at student achievement on standardized tests of mathematics, science, reading, and history from students who took academic curricula only and students who took both academic curricula and CTE curricula. The results show that based on test performance in the four core academic subjects, students who concentrate on academic curriculum and students who took both curricula differed slightly. He assumes that a small but statistically significant advantage benefited academic concentrators perhaps partially because of additional coursework in advanced subjects. Also, Plank (2001) lists the table below to show the average/mean of high school students' grades of academic concentrators and cross academic and CTE concentrators on various core courses such as mathematics, science, English, social studies, and CTE. It shows the differences in numeric grades between academic concentrators and dual concentrators.

Table I

The average of high school students' grade of academic concentrators and CTE concentrators

	CTE (no) Academic (yes)	CTE (yes) Academic (yes)
All mathematics	3.8	3.7
Higher mathematics	2.5	2.1
All science	3.7	3.6
Higher science	2.6	2.2
English	4.4	4.4
Social Studies	3.8	3.6
CTE	2.4	6.5

(n = 10,408)

Source: "A Question of Balance: CTE, Academic Courses, High School Persistence, and Student Achievement," by Plank, 2001, *Journal of Vocational Education Research, 26*(3).

On the other hand, the Little Hoover Commission (2007) report says that students who take both academic courses and CTE courses have a higher probability in passing high school exit exams compared with students who take academic courses only.

Also, they earn higher wages in jobs after high school. Similarly, Castellano et al. (2004) discover in their research that high school CTE curricula can be presented successfully without sacrificing academic curricula, in such core subjects as science and English.

Likewise, the Lekes et al. (2007) study parallels the Castellano et al. finding. They discover that there are no differences between high school students who participate in CTE programs and students who do not participate in CTE programs in academic achievement measurements such as overall high school GPA, mathematics GPA, and science GPA. Therefore, academically, students who pursue career pathways and take CTE programs perform as well as students who do not pursue a CTE area.

Equally important is the Gray and Herr (2006) statement that CTE programs broaden students' career choices, helping them focus on their career track, and giving them a chance to obtain a higher income compared to students who do not take CTE. According to Gray and Herr (2006) at the high school level, students should be given alternatives in curriculum. They believe that not all students are fond of academic courses, thus, testing requirements such as No Child Left Behind (NCLB) were not designed with these students in mind. It is no wonder that the national dropout rate for high school students is 33%. With 30% of high school graduates going to work immediately after high school and not to college, high school should adequately prepare them to be as ready to work as their peers whom it prepares to go to college. The Gray and Herr (2006) arguments are based on the fact that high school graduates with technical skills more easily find a job with a decent salary. Additionally, Bragg (2001) states that secondary students who participate in technical preparation program (Tech Prep) tend to

look at work as an important part of their lives. Most of them have a part time or full time job after high school, whether they go to college or not. From her study she finds that Tech Prep participants possess higher technical skills which link them to careers offering higher income and have a propensity to earn wage increases over time.

Furthermore, a nation wide survey by Gray and Herr (2006) of high school students shows that 95 percent state they would like to go to higher education, and 85 percent say that they plan to go to a 4 year college. Gray and Herr (2006) assume that these students' answer is based on the information they received from teachers, parents, and people around them that college is the only way to have a good job with a good salary. Despite the fact that around two thirds of high school students do not have sufficient preparation to enter college, 70% of graduates enter college, most of them to a 4 year college. Ironically, about 50% of them do not finish college; they drop out with some debt.

Moreover, as to the effect of combined CTE curricula and academic curricula on high school dropout rates, Plank (2001) finds that it is proven to be correlated. The integration of CTE curricula and academic curricula has a potential in reducing the high school dropout rate. He discovers that the more CTE courses high school students take, the more the likelihood of dropping out decreases. This finding leads him to examine the best ratio in combining academic courses and CTE courses toward reducing the dropout rate. He suggests that a ratio of about three credits of CTE programs to every four credits of academic programs will result in the lowest dropout rate, particularly for students with risk factors such as records of low test scores or grades. From his findings, Plank (2001) suggests that it might be judicious for educators and policymakers to promote such a

course mixes between academic courses and CTE courses even when resulting in very small reductions in standardized test scores in core academic courses in exchange for higher graduation rates. His arguments are based on the assumption of the importance of high school diplomas in our society.

In its report, the Little Hoover Commission (2007) points out the vitality of mixing CTE into academic courses. This statement is based on research by California Longitudinal Pupil Achievement Data System (CALPADS) which indicates that the blending of CTE coursework and academic coursework has a positive impact for high school students. Students who take part in CTE programs besides academic courses have a higher graduation rate than their peers. Also, the highest risk of dropout students (African American and Latino) benefit most from participating in CTE courses. Thus, a mixture of both courses has prospective to improve high school outcomes. Similarly, Association for Career and Technical Education (n.d.) explores the important role of CTE in the prevention and recovery of secondary students' dropout. Since CTE classes involve and engage students in activities which they considered useful to their lives and purposeful in real work situations, this experience motivated them to stay in school. Students regard the knowledge and skills they acquired from CTE classes to be relevant and necessary for their future careers. These reasons encourage students to learn more; as a result it prevents them from dropout. Also, CTE courses are good as recovery programs for previous dropout students as well. For students who have already left school before graduating, CTE programs offer alternative delivery systems that provide skills to re-engage dropout students with activities that help shape their future careers.

Meanwhile, Stone and Alfeld (2004) identify two elements in CTE programs that affect youths' decision to stay at school, thus preventing them from leaving school prematurely: career pathways and work-based learning. Stone and Alfeld (2004) define career pathways as programs that introduce career clusters such as health, automotive, or business careers to students so they can focus on integrating the curriculum with their interest/career choice. Stone and Alfeld (2004) mention a study in California in which career concentrated students were 2.5 times less likely to dropout than their peers. What is more, they found that students who are active in work-based learning have a likelihood of a dropout rate decreasing by as much as 30 percent. The rationale behind this forecast is that school offered, work-based learning provides large opportunities for students to put their knowledge and skills to work in various ways including internship, job shadowing, etc. Hence, they believe CTE is a program useful to prevent high school students leaving school early before graduating.

Cohen and Besharov (2002) cite research by the U.S. Department of Education which looks at the impact of high school CTE programs on different outcomes such as dropout rate, student achievement, attendance, college attendance, and labor market success. According to Cohen and Besharov (2002) students in a vocational track are more likely to stay in and complete high school. Thus, in general, CTE programs are having a moderately positive effect on the graduation rate. An interesting phenomenon is that, on average, students in academic tracks achieve slightly higher GPA's than students in vocational tracks, but students in a general track are estimated to have the same grades as students in a vocational track. Cohen and Besharov (2002) argue that the cause of a higher average GPA in academic classes may be that vocational track students do not

attain grades as high as their peers in academic tracks because they are not interested in the subjects. However, the new CTE programs in California show promising results where vocational track students demonstrate an increasing level of achievement which has proven to be better than that of academic track students. Also, the research finds that typical students in academic tracks need an average of 14 years to finish high school; meanwhile, it takes only 12.5 years for students in vocational tracks to graduate. Cohen and Besharov (2002) assume that attendance plays an important role in this difference. In regard to college enrollment, vocational track students are less likely to attend college than academic track students. The argument behind this trend is that vocational track students do not plan to go to college for many reasons such as: economy, ability, family background, etc. Additionally, some research finds that vocationally concentrated graduates who work in the area related to their skills have the advantage of earning about 7 to 10 percent more than students in general curriculum tracks. It is even worse for academically concentrated students who do not have any advantage in possessing any skills at all. The authors have a strong belief that CTE programs can diminish the unemployment rate and fill positions of employment in the least desirable jobs. In fact, Cohen and Besharov (2002) believe that:

> CTE is one promising strategy for addressing the difficulties faced by high school dropouts and graduates who seek jobs or attend college without adequate preparation. Through contextual learning and connections with adult mentors, CTE can engage students who otherwise might lose interest in school. By providing linkage to employers and a try out period for new high school

graduates, CTE can enhance the chances for finding good jobs that lead to rewarding careers (p. 15).

The profile of National CareerTech, Oklahoma CareerTech, and RTC

In its report to Congress, National Assessment of Vocational Education (NAVE, 2004) identifies that CTE program students typically are males, have behavioral problems, have disabilities, are from rural schools and/or low incomes families, and enter high school with low academic achievements. In regard to the demographic of CTE program students, number one is African American followed by Hispanic, White, and Native American vying for second place; the lowest is Asian. Students with less limited English proficiency (LEP) are less likely to participate in CTE programs. Recently, the latest trend is that CTE programs have started to draw more attention from academically talented students than before. This is due to the effort of CareerTech's expansion of programs such as pre-engineering, information technology, and education to the existing traditional programs. Ironically, some challenges faced by schools with high levels of poverty among students, high numbers of special needs students, or those in rural areas, have fewer specialty CTE programs available for students. Also, in these needy schools, programs were sometimes eliminated or cut off because of financial problems and a shortage of instructors.

Palmer and Gaunt (2007) in their research profiling CTE and non-CTE students in Michigan discovered many different features of CTE students and non-CTE students in school and life. In their academic standing, CTE students, on average, have lower grades compared with non-CTE students. The average grade for CTE students was in the *B's classification*, while for non-CTE students the average grade was in the *A's and B's*

classification. Palmer and Gaunt (2007) state that this finding is similar with the finding of Levesque's and Hudson's research in 2003 which found that students with high academic achievement are less likely to take CTE programs. Financially, CTE students were slightly less fortunate than non-CTE students. To state it conversely, overall CTE students were more disadvantaged economically compared with non-CTE students. In regard to household living arrangements, CTE students have higher occurrences of living with other relatives or adults who are not their parents; living with a single parent; or living with one parent and stepparent as compared to non-CTE students. Non-CTE students have a higher percentage of living arrangements with both parents. Hence, the profile of CTE students according to Palmer and Gaunt (2007) can be described as students with low grade achievement, who are economically disadvantaged, and who come from non-intact families.

Likewise, Rose (n.d.) mentions that early on, students of vocational education were labeled as being *hand-minded* and were not able to handle intellectual materials compared with their academic peers which were *abstract-minded*. It is undeniable that many CTE-type students come from lower social class backgrounds such as poor schools, limited sources, and lack of preparation. Thus, they demonstrate a tendency of not doing well in school.

Since no data could be found for the completion nor the dropout rate of secondary CTE students nationwide, the assumption of equivalent data for national high school student completers and the nationwide dropout rate is presented. According to National Center for Educational Statistics (NCED, 2001) the national average of high school completion rates in the year 2000 was 86.5 percent. This percentage was calculated base

on “the proportion of 18-through-24-year-olds who have left high school and earned a high school diploma or equivalent, including a General Education Development (*GED)* credential” (p. 17). The high school completion rate was increased slightly (about 2.6 percent) from 1972 which was 82.8 percent, to 85.4 percent in the year 1985. Since 1985 the completion rate varied from 85 percent to 87 percent. Thus, over a 29 year period, the high school completion rate was increased by approximately 3 percent only.

Table II

Public high school student completers by state:

Four-year high school completion rates, by state: School years 1994-95 through 2000-01							
State	2000-01	1999-2000	1998-99	1997-98	1996-97	1995-96	1994-95
Alabama	80.0	79.8	78.9	78.3	76.8	—	—
Alaska	75.2	77.3	78.9	—	—	—	—
Arizona[1]	68.3	—	63.2	65.3	62.5	61.4	62.0
Arkansas	79.1	80.1	81.0	81.2	80.0	80.7	80.4
California	—	—	—	—	—	—	—
Colorado	—	—	—		—	—	—
Connecticut	86.6	86.5	83.7	83.2	81.8	81.4	—
Delaware	81.6	80.8	82.9	81.9	80.4	81.3	—
District of Columbia	—	—	—	—	—	—	60.9
Florida	—	—	—	—	—	—	—
Georgia	71.1	70.7	68.9	68.3	67.6	—	—
Hawaii	77.7	—	—	—	—	—	—
Idaho[1]	76.9	—	74.7	73.2	72.4	—	—
Illinois	75.8	75.4	75.8	76.9	76.1	—	—
Indiana	—	—	—	—	—	—	—
Iowa	89.2	88.8	88.3	88.0	87.1	—	—
Kansas	—	—	—	—	—	—	—
Kentucky	79.9	—	—	—	—	—	—
Louisiana[2]	65.0	62.6	61.5	60.4	60.7	—	—
Maine	86.5	86.2	86.4	86.5	86.4	—	—
Maryland	83.2	81.9	81.6	80.6	80.4	—	—
Massachusetts	86.3	85.5	86.0	85.6	85.8	84.6	85.3
Michigan	—	—	—	—	—	—	—
Minnesota	82.5	81.2	81.2	80.3	—	—	—
Mississippi	77.3	76.4	76.4	76.0	75.5	75.5	77.9
Missouri	81.0	79.6	77.8	76.9	74.8	74.7	75.3
Montana	82.1	82.4	82.0	—	—	—	—
Nebraska	83.9	85.1	84.5	83.2	83.0	84.6	84.5
Nevada	73.5	70.2	66.9	64.5	64.4	64.1	64.1
New Hampshire	—	—	—	—	—	—	—
New Jersey	88.0	86.7	85.2	84.6	85.2	—	—
New Mexico	74.4	73.0	70.6	69.0	68.6	68.8	70.0

New York	81.6	—	—	—	—	—	—
North Carolina	—	—	—	—	—	—	—
North Dakota	90.1	88.9	89.7	89.5	89.9	90.6	—
Ohio	81.0	80.4	80.5	79.5	79.4	—	—
Oklahoma	79.2	78.8	78.7	78.3	78.6	—	—
Oregon	76.4	—	—	—	—	74.2	75.6
Pennsylvania	84.0	84.1	84.0	83.8	84.2	84.2	84.2
Rhode Island	79.8	80.8	81.8	80.9	80.7	81.6	80.8
South Carolina	—	—	—	—	—	—	—
South Dakota	84.6	83.6	81.7	81.3	81.9	—	—
Tennessee	79.5	78.8	78.5	83.5	78.3	—	—
Texas	—	—	—	—	—	—	—
Utah	82.6	81.4	80.1	81.3	83.7	—	—
Vermont	81.9	81.4	82.1	81.8	82.0	—	—
Virginia	83.8	81.8	81.5	81.1	81.6	—	—
Washington	—	—	—	—	—	—	—
West Virginia	83.4	82.6	83.2	83.9	83.3	—	—
Wisconsin	90.0	89.3	89.7	89.8	89.0	—	—
Wyoming	76.5	77.6	77.2	77.3	76.8	—	—
Department of Defense (DoD) dependents schools, Bureau of Indian Affairs, and outlying areas							
DoD schools (overseas)	—	—	—	—	—	—	—
DoD schools (domestic)	—	—	—	—	—	—	—
Bureau of Indian Affairs	—	—	—	—	—	—	—
American Samoa	90.0	91.0	94.4	95.9	96.4	94.8	94.4
Guam	51.2	52.7	53.4	54.5	46.5	45.8	64.3
Northern Marianas	64.5	72.7	67.7	71.1	—	—	—
Puerto Rico	94.6	93.4	92.3	91.5	94.7	93.6	—
Virgin Islands	72.3	78.8	83.9	78.3	78.8	76.6	85.9

Source: *Dropout Rates in the United States: 2000,* by National Center For Education Statistic (2001).

Meanwhile, the *status* high school dropout rate nationwide in the year 2000 was 10.9 percent. NCED (2001) defined *status* dropout rate as cumulative data of young adults between the ages of 16 to 24 who are not enrolled in high school, who do not finish high school and do not obtain a GED. Meanwhile the *event* dropout rate nationally

in year 2000 was 4.8 percent. *Event* dropout rate is the yearly dropout rate of young adults ages 15 through 24 who were enrolled in high school a year before but do not enroll for the following year.

Table III

Event dropout rates for grade 9-12, by state 1993-1994 through 1998-1999

State	Event dropout rate (percent)					
	1993–94	1994–95	1995–96	1996–97	1997–98	1998–99
Alabama	5.8	6.2	5.6	5.3	4.8	4.4
Alaska	_	_	5.6	4.9	4.6	5.3
Arizona	13.7	9.6	10.2	10.0	9.4	8.4
Arkansas	5.3	4.9	4.1	5.0	5.4	6.0
California	_	_	_	_	_	_
Colorado	_	_	_	_	_	_
Connecticut	4.8	4.9	4.8	3.9	3.5	3.3
Delaware	4.6	4.6	4.5	4.5	4.7	4.1
District of Columbia	9.5	10.6	_	_	12.8	8.2
Florida	_	_	_	_	_	_
Georgia	8.7	9.0	8.5	8.2	7.3	7.4
Hawaii	_	_	_	_	_	_
Idaho	8.5	9.2	8.0	7.2	6.7	6.9
Illinois	6.8	6.6	6.4	6.6	6.9	6.5
Indiana	_	_	_	_	_	_
Iowa	3.2	3.5	3.1	2.9	2.9	2.5
Kansas	_	_	_	_	_	_

Table III—part 2

Kentucky	_	_	_	_	5.2	4.9
Louisiana	4.7	3.5	11.6	11.6	11.4	10.0
Maine	3.1	3.4	3.1	3.2	3.2	3.3
Maryland	5.2	5.2	4.8	4.9	4.3	4.4
Massachusetts	3.7	3.6	3.4	3.4	3.2	3.6
Michigan	_	_	_	_	_	_
Minnesota	5.1	5.2	5.2	5.5	4.9	4.5
Mississippi	6.1	6.4	6.2	6.0	5.8	5.2
Missouri	7.0	7.0	6.5	5.8	5.2	4.8
Montana	_	_	5.6	5.1	4.4	4.5
Nebraska	4.6	4.5	4.5	4.3	4.4	4.2
Nevada	9.8	10.3	9.6	10.2	10.1	7.9
New Hampshire	_	_	_	_	_	_
New Jersey	4.3	4.0	4.1	3.7	3.5	3.1
New Mexico	8.1	8.5	8.3	7.5	7.1	7.0
New York	_	_	_	_	_	_
North Carolina	_	_	_	_	_	_
North Dakota	2.7	2.5	2.5	2.7	2.8	2.4
Ohio	4.7	5.3	5.4	5.2	5.1	3.9
Oklahoma	4.6	5.8	5.7	5.9	5.8	5.2
Oregon	7.3	7.1	7.0	_	_	6.5
Pennsylvania	3.8	4.1	4.0	3.9	3.9	3.8

Table II—part 3

Rhode Island	4.9	4.6	4.6	4.7	4.9	4.5
South Carolina	–	–	–	–	–	–
South Dakota	5.3	5.3	5.7	4.5	3.1	4.5
Tennessee	4.8	5.0	4.9	5.1	5.0	4.6
Texas	–	–	–	–	–	–
Utah	3.1	3.5	4.4	4.5	5.2	4.7
Vermont	4.8	4.7	5.3	5.0	5.2	4.6
Virginia	4.8	5.2	4.7	4.6	4.8	4.5
Washington	–	–	–	–	–	–
West Virginia	3.8	4.2	3.8	4.1	4.1	4.9
Wisconsin	3.1	2.7	2.4	2.7	2.8	2.6
Wyoming	6.5	6.7	5.7	6.2	6.4	5.2

Source: *Dropout Rates in the United States: 2000,* by National Center For Education Statistic (2001).

As for Oklahoma, neither the dropout rate of high school students nor secondary CTE students' data were available. Instead, Oklahoma Department of Career and Technical Education (2008) lists that in the year 2006, the percentage of program completers statewide for secondary school students was 85%; for students who transferred to other programs or other schools was 12%; and for students who left the program was 4%. At RTC, in the same year of 2006, the percentage of secondary students who completed the program was 77%; of students who transferred was 21%; and

of students who left the program was 2%. According to its website (2008), program completers or students retained in programs are defined as the "percent of secondary and adult students who are retained in the programs for the following year or who were occupational or program completers (p. 8)." Transfers refer to the "percent of secondary and adult students who transferred out of the career and technology education (CTE) program" (p. 8). Leavers can be described as the "percent of secondary and adult students who left the program and were not still in school" (p. 8).

Since *transfers* refers to those students who transferred out of career and technical education, these students were not completing the program. Also, *leavers* refer to those students who dropped out of school. Thus, both transfer students and leavers were students who did not complete the program or as were counted non-completers or dropout students (Table IV).

Table IV

Percentage of program completers, transfer, and leavers in Oklahoma for the year 2006

	TECHNICAL SCHOOL	PROGRAM COMPLETER	TRANSFER	LEAVERS
1	Autri	86	11	4
2	Caddo Kiowa	74	26	0
3	Canadian Valley	86	12	2
4	Central Tech	88	11	1
5	Chisholm Trail	87	10	3
6	Eastern Oklahoma County	88	11	1
7	Francis Tuttle	87	10	3
8	Gordon Cooper	92	6	3
9	Great Plains	81	14	4
10	Green Country	87	13	1
11	High Plains	83	15	1
12	Indian Capital	74	22	4
13	Kiamichi	83	15	2
14	Meridian	77	21	2
15	Metro	90	8	2
16	Mid America	80	19	1
17	Mid-Del Tech	86	11	2
18	Moore Norman	87	11	2
19	Northeast Oklahoma	83	15	2
20	Northwest Tech	74	21	5
21	Pioneer Tech	77	18	5
22	Pontotoc Tech	73	24	2
23	Red River Tech	83	15	2
24	Southern Oklahoma Tech	89	9	2
25	Southwest Tech	89	10	1
26	Tri County	92	7	2
27	Tulsa	90	0	10
28	West Watkins	75	24	1
29	Western Tech	79	17	5

Source: Oklahoma Department of Career and Technical Education (2008).

According to Berkenbile (2008) the technology center system in Oklahoma is "comprised of 29 districts with 56 campuses located throughout the state" (p. 1). Total enrollment for secondary students is 16,413 and for adult students is 12,320. Oklahoma has 466 public high schools and only 54 of them offer CTE programs in school.

Secondary students in these 54 schools who desire to take CTE programs can take them in their school or, if certain programs are not available, the school sends students to the closest technical school. Public and private high schools which do not offer CTE program also send their students to the closest technical school. The total number of high school students in Oklahoma is 156,651 of which 115,894 are enrolled in CTE programs (National Association of State Directors of Career technical Education Consortium, 2008). With high numbers of high school students involved in CTE programs, Oklahoma needs to find some answers in respect of the characteristics of CTE students who were able to complete/finish CTE programs.

In its website (2008) Oklahoma CareerTech system overview shows how CareerTech divides its curriculum delivery system into 5 channels: Comprehensive Schools, *Career*Tech Learning Network, Business and Industry Training, *Career*Tech Skills Center, and Technology Centers. *Comprehensive Schools* means local schools offering career and technology education to their students from grade levels 6 to 12. Usually Schools offer Career and Technology programs in the areas of family and consumer sciences, agricultural education, marketing education, business and information technology education, trade and industrial education, and health and occupation education. The *Career*Tech Learning Network is the nation's pioneer and the newest of Oklahoma's CareerTech delivery system. It provides learners with 24-hour-a-day training by means of Web-based instruction and interactive television. Thus, it serves learners/customers ranging from students to business and industry people; it is also state borderless meaning that learners can learn from everywhere, including other states. The Business and Industry Training program is designed to serve local Oklahoma business

and industry in three main categories: industry-specific and existing industry, adult and career development, and the Training for Industry Program (TIP). The *Career*Tech Skills Center was invented to train Oklahoma inmates with academics, coping, and hands-on technical skills. Its purpose is to help inmates land jobs after their release from prisons. The Skill Center has 19 locations in Oklahoma's public prisons, three locations in Juvenile facilities, and two in private correctional facilities.

Meanwhile, Oklahoma's Technology Centers offer programs to adult students and students of sending schools who cannot afford to have their own training centers because of lack of facilities such as laboratories or instructors, or do not have enough students enrolled in certain programs. These high school students are offered tuition-free opportunities for attending programs at a Technology Center. For adult students, tuition fees are charged. The total enrollment statewide for secondary school is 16,747 students (2007). Oklahoma's statewide secondary CTE students with economic disadvantages are 30%. Students are composed of Caucasian 71%, African American 6.8%, Asian 1.3%, Hispanic 5.2%, and American Indian 15.6%.

Even though Oklahoma is a leader in career and technology education, the secondary completion rate average is 85%, even worse for MTC at 77%. In its newest report (2008) for the years 2003-2004 and 2004-2005 for Consolidated Annual Reports (CAR), a mandatory fiscal and accountability report submitted by each state to the U.S. Department of Education, Oklahoma CareerTech did not meet its adjusted level of performance for secondary vocational skills. Every state has a baseline level of performance standard in percentage, and every state is encouraged to meet this performance standard. The CTE director is required to state whether he/she agrees with

the performance standard or not. If he/she does not agree with the state performance standard then he/she can negotiate to adjust/lower the performance standard. With adjusted levels of performance for secondary CTE students, Oklahoma did not meet the standard for two years in a row (state profile for Oklahoma, 2008).

The total enrollment of secondary students for MTC in 2006 was 437 students. At MTC, secondary students with economic disadvantages represented only 0.9%. Students consist of Caucasian 86.2%, African American 4.2%, Asian 1.1%, Hispanic 2.2%, and American Indian 6.3%. With the completer rate at 77 percent (compared to other technical schools in Oklahoma of which most had a higher completion rate), MTC ought to identify the attributes of secondary program completers in order to have a better grip in helping students to be successful.

Theories which support students' success as CTE program completers

Factors or characteristics of students' success as program completers are inseparable with the factors or characteristics that cause students to drop out. Therefore, theories and research findings of both factors/characteristics causing student success or student dropout will be discussed.

Schargel (2007) lists the root causes of school dropout as arising from the students themselves, their community, family, and the school itself. Factors specific to students contributing to the dropout rate can be described as "poor attitude toward school, low self-esteem, low ability level, attendance/truancy problems, behavior/discipline problems, pregnancy, drug/alcohol abuse, non participation at school, friends who dropped out, illness, and family problems" (p. 1). Community has its own culpability in

regard to dropout students such as "lack of community support services, high crime rate, few links between school and community, lack of community financial support for schools" (p. 1). Also, there are factors in a family that contribute to students dropping out: "lack of parental involvement in school, low parental expectations, non-English speaking home, ineffective parenting, dysfunctional home life, abuse, high mobility family, and parents who dropped out of school" (p. 1). Conditions within schools contribute to this drop out problem as well. Environment factors at school that tend to increase the number of drop out students:

> Negative school climate, disregard of individual learning styles, inconsistent discipline enforcement, lack of adequate counseling, lack of relevant curriculum, passive instructional techniques, poor use of technology, low retention, high suspension rate, low expectation of students, lack of language instruction for students from non-English speaking homes (p. 2)

A survey (Bridgeland et.al, 2006) in 25 different locations throughout the United States highlighting students' dropout rate uncovers the reasons behind high school dropouts. From interviews with the dropout students, it was concluded that the causes were:

- They felt that classes were boring and the subjects were not interesting to them (47%). (This statement comes predominantly from dropout students with high GPA's).
- They were not stimulated and encouraged to study harder (69%), although they knew that they would have been able to graduate if they had tried harder.

- They struggled with some personal reasons such as the need to work and have some money for themselves (32%); became pregnant (26%); were in charge of caring for family members (22%).
- They were not able to catch up with school work because they missed so many days of school (43%).
- They were already academically behind from elementary and middle school when they entered high school; individual helps were not available in high school (45%).
- They had to repeat a grade before dropping out (32%), and support was not available for them.

Furthermore, Bridgeland et.al. (2006) explains that dropping out of school is not an abrupt decision for these students. It is a slow but steady process of disengagement and skipping classes. Also, these students felt that they were given too much freedom and too few rules which made them dispossess any disciplined attitude toward school. Parents were not involved in their schooling process such as scores or absences; parents only became involved whenever they had discipline problems in school.

Similarly, California Dropout Research Project (2008) lists the reasons for the 10^{th} grader to drop out of school:

1. Did not like school
2. Failing school
3. Could not keep up with school work
4. Found a job
5. Was pregnant

6. Could not get along w/teachers
7. Could not do work/school at the same time (p. 5).

Moreover, Bridgeland et.al. (2006) propose that even though students who have dropped out blame themselves, schools can help to prevent dropout from happening. To avoid feelings of boredom, students need to be engaged in various kinds of activities in class to see the connection between learning and real life. Smaller classes will help individualize instruction and attention to students. Also, some private tutoring might be needed for students who fall behind. School discipline is in order. A student needs to have a relationship with at least one adult in school whom s/he could trust with whom to talk over challenges and difficulties.

According to Gray and Herr (2006), one of the major reasons for high school students to drop out is that students think what they learn at school is not "useful, interesting, or relevant" (p. 170) to their everyday life. They feel bored with the same routine classes over and over again, and they want some challenges or different types of teaching styles such as hands-on experience with connection to the real world, not only to abstract things.

Likewise, Finn and Rock (1997) state that for high school students who: come to class on time; complete their homework and all the assignments they have received; and prepare and participate in class usually reduce the possibility of dropout, regardless of external influences to which they are exposed. Basically being involved in school could outweigh the poor performance factors of at-risk dropout students caused by disadvantaged conditions such as students coming from low income families, living with dropout parents, composing minority students, etc.

In fact, Lamm, Harder, Lamm, Rose III, and Rask (2005) discover in their research multiple risk factors concerning high school dropout rate such as low achievement in mathematics and science; parental demographic; and lack of after school activities. They propose that students should be identified in regard the risk factors for dropping out of school, such as low achievement in mathematics and science, and be assisted with programs to improve. Students living in multiple residences, with a single parent, or dropout parents are at high risk in dropping out of school. Students who do not become involved in any extracurricular activity have higher chances in dropping out of school as well. Especially for students in those categories who are exposed to more than one at risk situation, the probability of dropping out of school is greater.

Chen and Thomas (2001) in their research at Taiwan vocational technical school (considered to have similar dropout problems with U.S. colleges and technical schools) describe how some students' factors and characteristics can be used as predictors of students' persistence at vocational-technical schools. First semester students with high GPA's usually have a higher probability of persistence. Gender is a factor; in this case, female students have a higher probability of persistence. Also, entrance examinations can be used as prediction toward persistence: the higher the grade, the higher the level of persistence. Students receiving occupational guidance programs have higher persistence because they know that they have future careers ahead of them which, in turn, motivates them to finish school. Educated parents and parents with high social economy status (SES) generally have a positive effect on students' persistence.

Meanwhile, Thorndike and Hagen (1959) think that there are many studies proven to be valid in predicting factors and characteristics of successful college students, but

researchers are not consistently effective in forecasting occupational students' success. Additionally, McAlister (1973) found that occupational students' success is less predictable than academic success for high school and college students. He argues that, besides grade point average of the student in high school, interest and satisfaction of the students in the career and technical programs they choose can be used to predict occupational success. Interestingly, the way students value prospective income and level of parents' education are only valid to forecast academic success. Moreover, Prediger, Waple, and Nusbaum (1968) found in their research that verbal intelligence quotient (IQ) is useful as a predictor for academic success, but it is not valid as a predictor of success for vocational (CTE) school. Furthermore, Kapes (1972) explains that, compared among themselves, successful vocational students posses the characteristic of higher than average cognitive ability and a higher level of social economic status (SES); and also, such students possess realistic occupational plans for the future.

West Virginia State Department of Education published a booklet identifying some characteristics and criteria (academic and personality) which were most likely relevant as predictors of success in secondary vocational-technical programs. Some academic criteria are school grades especially in mathematics, reading, English, and science; abstract reasoning; mechanical reasoning; aptitude scores; and achievement scores obtained from the Differential Aptitude Test and the General Aptitude Test Battery. Some personality and other factors are: program interest, attendance, ease in getting along with others, and teacher and counselor recommendations (Associated Education Consultants, Inc. 1979). Many researchers use different instrument tests as tools to predict students' success in CTE programs. For example, Prediger, Waple, and

Nusbaum in 1967 used cognitive and motor ability tests and found that the success of female students in CTE programs is easier to predict than that of male students. Similarly, Cox (1968) discovered that female students in CTE programs are more predictable than males. Steurer (1977) determines that CTE program students who have 70 percent or better scores in reading would be successful in completing the programs. As an instrument test, he used the CTE programs textbook. He believes that his method is more accurate than using academic reading scores in predicting CTE students' success. According to Aucker (1970), even if a CTE student achieves only average grades academically, a counselor's evaluation and rating of student ability and potential in helping a student choose a CTE program is the most important predictor in whether s/he will be successful in the future. Aucker's statement (1970) is supported by Prediger's (1972) arguments that the majority of CTE educators consider the skills, talents, and interests of students as major characteristics pertinent to the choice of program which results in student success.

Mitchell (1977) states that academic achievement in mathematics and language are vital for high school students who take vocational courses since he believes that they are the basic skills needed before students progress to learn further competency skills in CTE classes. He adds that, for CTE participants to succeed in their programs of choice, communication skills, including capability in reading and writing, are crucial to employ because students will be required to be able to read, understand, and find technical informational links to their occupational field.

Kotamraju (2007) defines CTE student success in three aspects: *engagement, achievement,* and *transition. Engagement* involves "attending, focusing and specializing

in coursework and work-based learning within programmatic career pathways and programs of study" (p. 1). *Achievement* is defined as "academic performance, skill development, and completing (graduating) school or college" (p. 1). *Transition* refers to students/program completers "either as high school graduates moving on to post-secondary education without the need for remediation or as managing the learning swirl that is taking place between education and the workplace" (p. 1). He offers some ideas that can be used to help CTE students achieve better results, such as, dual enrollment for high school students in which these students also enroll in the Postsecondary Enrollment Options. This option to combine technical and academic courses in postsecondary education presents greater possibility for success of CTE students. This success continuously carries through postsecondary education and beyond. Secondly, a good grade in mathematics courses leads to a better GPA and overall improves the graduation rate of CTE students. Thirdly, high wage earning is one of the factors that motivate students to complete the CTE programs they take. Students leaving before finishing the programs have less value to offer in order to receive high wage earnings.

Conclusion

Many researchers study the specific effects of CTE programs on high school students. The mix of CTE courses and academic courses taken by high school students has positive effects on reducing dropout rates and tardiness, broadening students' career choices, and providing higher wage earnings in jobs after high school. Based on the NAVE (2004) report and some other research, typical secondary CTE students are males, come from families with low incomes, come from non-intact families, have limited

sources, and enter high school with low academic achievement. Demographically, CTE students are composed of African American students as the highest percentage, followed by Hispanic, White, and Native American; Asian is the lowest percentage.

Oklahoma has 466 public high schools in which only 54 offer CTE programs in school. The total enrollment of secondary schools in CTE programs statewide was 16,143 in 2006. The average of Oklahoma secondary CTE student completers in 2006 was 85%, and for MTC was 77%. Students who did not complete the programs were listed as transfers or leavers. Thus, these students can be listed as non-program completers.

Some scholars such as Thorndike and Hagen or Chen and Thomas, find it more problematic to predict factors or characteristics of successful CTE students compared with academic students. Many researchers discover similar factors that have a high possibility of correlation with successful CTE program completers such as students' interest in the programs and counselors' recommendations.

CHAPTER III

METHODOLOGY

Introduction

This study is designed to determine if there are identifiable factors or characteristics of secondary CTE students that lead to their success as program completers at RTC. The research question asked what the attributes of a program completer are for secondary students at RTC. The factors or characteristics of students which are available in archival data are:

- Gender
- Race
- Economic disadvantage
- Sending school
- Program
- Grade
- Attendance
- PLAN scores of English, mathematics, reading, science, and the composite of all scores in PLAN
- KeyTrain scores of mathematics, locating information, and reading for information

- WorkKeys scores of applied mathematics, locating information, and reading for information.

A secondary student program completer is defined as a high school student who completes both semesters of a one-year program or four-semesters of a two-year program of her/his choice, who does not transfer to other programs/classes or leave the program.

Basic Design Approach

Descriptive study is the basic design approach for this research. This study is a rich descriptive study to establish a baseline for the collusion of and reference for future use of the data RTC has on file. RTC is selected as the context for this descriptive study which purposes to create a better understanding of the factors or characteristics of its secondary students that lead to their success as program completers. A quantitative description of archival data provided by RTC will be presented to analyze the profile and attributes of secondary program completers that lead to their success in completing the program. Descriptive statistics are used to describe the basic features of the data, to organize the data, to look for revealed patterns in the data, and then to summarize the findings from the archival data sets of 103 secondary program completers. Finally, quantitative descriptions will be presented in a manageable form. The findings will be used to discuss the outcomes and recommendations for RTC and future research.

Participants

Fraenkel and Wallen (2003) define population as "the group of interest to the researcher, the group to whom the researcher would like to generalize the results of the

study" (p. 97). Since the purpose of this study is to determine what factors or characteristics of students lead to the success of secondary students as program completers at RTC, the population in this study consists of secondary program completers at RTC. The target population of this study is secondary completers at RTC for the school years 2005-2006 and 2006-2007. Meanwhile, the *sample* in research study refers to "any group on which information is obtained" (Fraenkel and Wallen, 2003, p. 96). Hence, the participant or the purposive sample consists of secondary students at RTC who completed their programs in the years 2005-2007; and who have logged the record data of program, gender, attendance, grade, economic status, race, complete scores of PLAN test, complete scores of KeyTrain, and complete scores of WorkKeys. Secondary students at RTC who also completed their programs in the same years, but do not have complete sets of the data listed above are not included in this study. The total number of respondents in this study whose data can be used and analyzed is 103. The entire set of the data is analyzed to determine what factors do or do not have a bearing on program completers. Secondary completers at RTC come from twelve high schools in its district. Twenty four programs are offered during the day time; evening courses consist mostly of adult students. However, participants in this study completed their education from 12 programs because those 12 programs have secondary students, and complete data sets were available on those students.

The Variables

As noted previously, the factors/characteristics of secondary student completers will be managed and analyzed to observe which factors/characteristics lead to student

success as program completers. These factors/characteristics as variables presented in an archival data consist of:

Program

As reported by the institution, programs in this study are these in which students enrolled in and completed the program between the school years 2005-2006 and 2006-2007. Students who completed the program received certificates/diplomas of completion from RTC and should have taken WorkKeys before leaving school. Although RTC offers 24 programs to all students, the secondary student completers for this study were representative of 12 programs only. The programs are:

1. Air Conditioning/Refrigeration (ACR).
2. Automotive Technology (AT)
3. Cosmetology (COS)
4. Collision Repair Technology (CRT)
5. Culinary Arts (CA)
6. Drafting (DFT)
7. Health Careers (HC)
8. Masonry (MAS)
9. Manufacturing Technology (MTT)
10. Pre-Engineering Technology (PET)
11. Residential/Commercial Construction (RCC)
12. Welding (WT)

Sending Schools

Sending schools are high schools in surrounding areas which sent their students from 9th to 12th grades to study at RTC. PLAN test scores of students were requested as part of the submission but no minimum scores were required. In this study, there were 12 sending high schools with enrollment numbers ranging from 64 to 1126 students. Since the sample in this study came from 12 sending schools, the distribution data of the sending schools will be divided into 4 groups based on the enrollment numbers. Group 1 includes sending schools with student enrollment under 100. Group 2 consists of sending schools with student enrollment of 100-200. Group 3 represents sending schools with student enrollment of 200-500. Group 4 includes sending schools with student enrollment of 500 and up.

Gender

As reported by institution, there are 2 different genders in this study: male and female.

Attendance

As reported by institution, each program has slightly differing required training hours. Also, each program has its own unique way in setting the meeting hours in a semester. The instructor in every program records the final attendance report in percentage. Students who always attended and never missed any class are counted as having 100 percent attendance, and students who never came to class are counted as having 0 percent attendance.

Grade received for RTC program

A final grade is given to students at the end of every semester. Two grades were given for the whole school year then divided by 2 to determine the final grade for that year. The original grade is given to students in alphabetical scoring: A, B, C, and D; and is then converted into numerical code in order to be analyzed. F is not a grade option for program completers. Grade A is converted into 4. Grade B is converted into 3. Grade C is converted into 2. Finally, grade D is converted into 1.

Economically disadvantaged

As reported by institution, students who are categorized as coming from economically disadvantaged families are students that are eligible for free lunch at a home school/sending school. These students will be given the numerical code of 1. Code 2 signifies students who are not eligible for free lunch at school. No data are available in terms of the level of income of code 1 families. Also, the data that available are from the school year 2006-2007 only. Thus, the analysis will be for that year.

Race

The total participants in this study are 103 students which are composed of six different races: Hispanic, Native American, Asian/Pacific Islander, Caucasian, and African American. There were 6 Hispanic completers which is equal to 5.7 percent of the total completers. Native American composed 2 completers which is equal to 1.9 percent. Asian/Pacific Islander composed 5 completers which is equal to 4.8 percent. The highest completers are Caucasian with 82 students which is equal to 80 percent of the total student completers. African American composed 8 completers which is equal to 5.7 percent. Since races other than Caucasian combined to compose only 20 percent, and

the Caucasian percentage is very dominant, composing 80 percent of the total completers, race factor is not going to be included in this study.

PLAN

Usually the PLAN test is given to 10th grade students in the fall semester. It is used to measure students' recent academic progress, explore career/training choices, and assist in plans for the rest of the years in high school and post-graduation (PLAN website, 2008). Incoming secondary students at RTC are encouraged to submit their PLAN test scores, although there is no minimum score required. There are 4 PLAN test scores available: English, mathematics, reading, and science plus one score for the composite of all the scores. The score scores range from 1 as the lowest to 32 as the highest. Average scores in each subject and in each program will be analyzed, and then the overall average score for each subject will be presented and interpreted to profile the scores that lead to students' success as program completers.

KeyTrain

Since KeyTrain is a training system for WorkKeys, it consists of the exact same subjects as WorkKeys assessment: applied mathematics, locating information, and reading for information. It provides a complete learning system for general skills required by all jobs based on WorkKeys measurements. KeyTrain can be used to review topics and to solve problems in each WorkKeys area. The KeyTrain system includes "targeted, self-paced instruction, pre- and post-assessments, a complete learning management system and an occupational job profiles database" (KeyTrain website, 2008, p. 1). KeyTrain assessment was administered to students in the first semester of their program. In KeyTrain, the highest level for each test is 7, and the lowest level students

could achieve in order to be able to apply their theory into practice is 3. Average KeyTrain scores in each subject will be recorded in each program, and then the overall average of each subject will be calculated to outline scores that could lead to students' success as program completers.

WorkKeys

According to WorkKeys website (2008), WorkKeys foundational skills is an employment system that measures "cognitive abilities of applied mathematics, reading for information, and locating information" (p. 1) of employees. The WorkKeys *applied mathematics* is used to measure individual skills in applying mathematical reasoning, critical thinking, and problem-solving techniques to work-related problems. The WorkKeys *reading for information* is used to measure individual skills in reading and using written text related to jobs such as memos, letters, directions, signs, notices, bulletins, policies, and regulations. The WorkKeys *locating information* is used to measure individual skills with graphics such as charts, graphs, tables, forms, flowcharts, diagrams, floor plans, maps, and instrument gauges in the workplace. These three foundational skills are needed in all jobs of a regular type from blue collar to white, albeit to different degrees for each job. Based on these three basic individual skills levels, employees are placed and promoted to the right position to be more successful. This system benefits individuals, educators, and employers because it speaks a common language in describing basic skills required for jobs. WorkKeys assessment was administered to the students at the end of the program. A certificate with level of competency in applied mathematics, reading for information, and locating information was given to each of the completers. The highest score for each test is 7, but a score of 3

is considered the minimum score students should/could have in order to be able to connect her/his cognitive ability to real work. Average scores of each subject in every program will be computed, and then the overall average score of each subject will be examined to determine the scores that could lead to student success as program completers.

Meanwhile, WorkKeys also profiles standard scores for individuals able to function in a certain workplace. In this study, these recommended WorkKeys scores will be presented in each profile of every program. The recommended WorkKeys is the scores of recommended levels for a completer to be successful in the workplace while holding a specific job in this field such as Air conditioning/Refrigeration.

Program completers

In this study, program completers are secondary students who completed a one-year or a two-year program at RTC in 2005-2007 school year periods, and who had a complete data set of the program in which they participated, gender, race, economic disadvantage, sending schools, program, attendance, PLAN scores, KeyTrain scores, and WorkKeys scores.

Data collection procedures

To accomplish this study, the following steps were taken:

1. In accordance with Institutional Review Board (IRB), a permit was granted to collect archival data from RTC. The data must be collected so that it is not personally identifiable from school records.

2. Permission from school to collect archival data was accomplished. Permission was received, and archival data retrieved from RTC.
3. Researcher retrieved data from RTC—at no time was identifiable information removed from the premises.

Data Analysis

The study examines the data that has been collected such as gender, race, economic disadvantage, sending school, program, grade, attendance, PLAN scores, KeyTrain scores, and WorkKeys scores which provide adequate support for secondary students at MTC as program completers. To answer the research question, archival student data will be analyzed using Microsoft excel. Gender will be analyzed so as to determine if the gender of a student leads her/him to a certain program, and whether they thrive with their choice. Economic status will be analyzed to see if it leads to certain accomplishment. Attendance will be analyzed to discover whether it has any effect on student success. Grades will be analyzed to see if scoring achievements lead to student success. PLAN, KeyTrain, and WorkKeys scores will be analyzed to see what level of scores lead to student success. A simple regression will be utilized to observe whether there is a relation between KeyTrain and WorkKeys.

Each program will be analyzed concerning the gender, attendance, and economy status; and as to the averages scores of grade, PLAN test, KeyTrain assessment, and Workkeys assessment. A standard deviation of each average will be presented to provide a better scope of the average number. Finally, a profile of secondary student completers in each program will be presented. The results will be compared to the overall average

and to other programs as well. The overall average is presented as a general profile of secondary student completers at RTC. Also, average PLAN test scores of each program will be compared to the national benchmark of PLAN scores for each subject.

Model Statistic

Besides the profiles of secondary completers that will be presented in chapter V, the relation between KeyTrain and WorkKeys will be investigated and presented as well. The underlying assumptions are that there are correlations between these two variables. The models used are:

$$Yij = \alpha i + \beta i Xij + \varepsilon ij \qquad (1)$$

Where Y1j = Work Keys Mathematics

Y2j = Work Keys Locating Information

Y3j = Work Keys Reading for Informations

j = 1, 2, …….., 103

X1 = Key Train Mathematics

X2 = Key Train Locating Information

X3 = Key Train Reading for Information.

Collection of Data

Since WorkKeys is widely used by business and industry in Oklahoma as one of their recruitment systems, and in compliance with them, RTC started implementing WorkKeys assessment as an integral part of its system a few years ago. RTC students who completed the programs were required to take WorkKeys assessment and a

certificate is given to them. Since WorkKeys is new for RTC, the administrators aspired to understand more about its benefits. As a result the researcher met with RTC administrators in summer 2006 to discuss the possibility of doing research on WorkKeys among RTC student completers. The topic was discussed and the administrators were willing to provide data for this study. Since the researcher did not know exactly what kind of student data RTC had on file, the committee members in advisement of this study requested that the researcher collect the data first and decide on the topic based on the data available.

The researcher contacted the administrators concerning the data collection procedures. One of the counselors was in charge of providing the researcher with the data needed from RTC archived files. Since this occurred at the beginning of the summer semester of 2007, the collection of the data was a little difficult because some administrators in charge of the data were not in the office for various reasons. Since WorkKeys was the first issue to arise in the initial meeting with RTC administrators, the researcher started to collect data on students who had WorkKeys scores on file. When the fall semester of 2007 started, the data collection process was slowed because the administrators were busy with beginning a new semester. Also, the data were not kept in one place; different administrators had different data. The counselor in charge had to ask different people/administrators who kept certain data of students to send these to her. This procedure slowed down the process of data collection. The researcher assisted the counselor in putting the data together in excel format, but the data was kept at RTC until collected in its entirety. In January 2008 all RTC student data had finally been organized

in one place. The data collection process took approximately 18 months from the initial meeting in summer 2006 until all data had been collected in January 2008.

For the year 2005-2006, each student had 16 pieces of data and there were 112 completers; thus, there were 16x112=1792 pieces of data. For the year 2006-2007, each student had 17 pieces of data, including economic disadvantages, and there were 129 completers; thus, there were 17x129=2193 pieces of data. The total data for both years were 1792+2193=3985 pieces. This discrepancy in pieces of data occurred because for the 2005-2006 the data of economic disadvantaged students were not collected. All 3985 pieces of data were organized in excel format with no student identification. Since this study focused only on the profile of secondary student completers, adult students' data were eliminated. The total data for the years 2005-2007 became 183. The next step was to eliminate incomplete data of secondary student completers. Finally, the data that could be used for this study became 103. It took approximately 500 hours for the researcher to collect, organize, and review the data. The unidentified archival data in excel format was used for this study in compliance with an IRB permit obtained by the researcher.

CHAPTER IV

FINDINGS

Historical background of data collection

In chapter three, the methodology of this study was presented to explain how the research question would be answered. The research question was what are the characteristics of successful program completers for secondary students at RTC for the 2005-2007 school years? In this chapter, the data will be analyzed with further methods based on the method presented in chapter three.

In this study, the data received was in the form of archival data provided by RTC. First, the data was collected from all student completers for the school years 2005-2006 and 2006-2007. There were 112 completers for the 2005-2006 school year, and 129 completers for the 2006-2007 school year. Hence, for both years the total of completers was 241. Since this study is looking at secondary student completers only, adult student data was removed from the original. The total data for secondary student completers for the 2005-2006 school year becomes 100, and for the years 2006-2007 school becomes 83. Thus, the total data for secondary completers only for the years 2005-2007 was 183. Of these 183 secondary completers, some did not have the complete data set needed for this study, including: gender, race, economic disadvantage, sending school, program, grade, attendance, PLAN test scores, KeyTrain training scores, and WorkKeys assessment scores. Some students did not have attendance data (47).

There were 42 students that did not have their grades recorded. There were 57 students who did not have PLAN test scores recorded. For 59 students, the KeyTrain training record could not be found; also WorkKeys assessment data was missing from the record for 13 students. The total number of increments of incomplete student data was 80. To avoid unfair treatment of the independent variables, incomplete data cannot be used in this study. Therefore, these 80 were eliminated. The final number of completed secondary student data that was eligible to be managed and analyzed in this study was 103. This is about 43 percent of the total of the first data collected which included adult students and about 56 percent of the total number of secondary student completers only.

Table V

Student completer data

	2005 – 2006	2005 – 2007	Total
All completers	112	129	241
Secondary completers (adult completers not included)	100	83	183
Secondary completers who have complete data set	65	38	103

Table VI

Completers with missing data

		Total
Total of secondary completers		183
Missing attendance data	47	
Missing grades	42	
Missing PLAN test scores	57	
Missing KeyTrain scores	59	
Missing WorkKeys scores	13	
Combined missing data		- 80
Sample size		103
Percentage of population		56%

Programs and gender

Although RTC offers 24 programs to students, secondary student completers in this study were from 12 programs only: Air Conditioning/Refrigeration, Automotive Technology, Cosmetology, Collision Repair Technology, Culinary Arts, Drafting, Health Careers, Masonry, Manufacturing Technology, Pre-Engineering Technology, Residential/Commercial Construction, and Welding. Programs that did not have

secondary completers for the years 2005-2007 were: Biotechnology, Business Technology, CNC Machining, Certified Massage Therapy, Electrical Technology, Health Informatics Technology, Information Technology, Machine Tool, Pharmacy Technician, Practical Nursing, Precision Metal Fabrication, and Radiologic Technology. Table 6 shows the choice of programs in these 103 students. From 103 students, 42 of them were females (41%), and 61 of them were males (59%).

It is not surprising to discover that females dominated and males dominated enrollments appeared in certain programs. Females were most prominent in the fields of Cosmetology and Health Careers. The Cosmetology program was composed of 93% females (13 completers) compared to 7% males (1 completer). In health careers, females composed 85% (23 completers) compared to males who only composed 15% (4 completers). Meanwhile, males were most dominant in the areas of Residential/Commercial Construction, Welding, Manufacturing Technology, Collision Repair Technology, Masonry, and Air Conditioning/Refrigeration, programs in which all of the completers were males. Also, males were dominant in: Pre-Engineering Technology (90%), Automotive Technology (83%), and Drafting (80%).

Table VII

Programs and Genders

Name of program	Number of completers	Female	Male
Cosmetology	14	13 (93%)	1 (7%)
Health Careers	27	23 (83%)	4 (15%)
Culinary Arts	3	1 (33%)	2 (67%)
Automotive Technology	12	2 (17%)	10 (83%)
Drafting	10	2 (20%)	8 (80%)
Pre-Engineering Technology	10	1 (10%)	9 (90%)
Residential/Commercial Construction	6	0 (0%)	6 (100%)
Welding	6	0 (0%)	6 (100%)
Collision Repair Technology	5	0 (0%)	5 (100%)
Manufacturing Technology	5	0 (0%)	5 (100%)
Masonry	3	0 (0%)	3 (100%)
Air Conditioning/Refrigeration	2	0 (0%)	2 (100%)
Total	103	42 (41%)	61 (59%)

Meanwhile, males are most dominant in the areas of Residential/Commercial Construction, Welding, Manufacturing Technology, Collision Repair Technology, Masonry, and Air Conditioning/Refrigeration, programs in which all of the completers were males. Also, males are dominant in the following programs: Pre-Engineering Technology (90%), Automotive Technology (83%), and Drafting (80%).

Programs and attendance

Attendance of secondary completers was high, with the lowest attendance being 86 percent in the Air Conditioner/Refrigeration program, and the highest being 96 percent in Culinary Arts, Collision Repair Technology, and Masonry. The average attendance in all programs was 92 percent (Table VIII).

Table VIII

Average percentage of attendance completers in each program

Name of program	Average Percentage
Collision Repair Technology	96
Masonry	96
Automotive Technology	95
Health Careers	95
Pre-Engineering Technology	95
Manufacturing Technology	94
Residential/Commercial Construction	91
Cosmetology	90
Drafting	90
Welding	90
Culinary Arts	89
Air Conditioning/Refrigeration	86
Mean/Average	92

Programs and grade

In regard to student grades, based on 4.0 being the highest score a student can achieve, the highest average grade is 3.66, and the lowest is 2.25. The highest average grade of 3.66 occurs in the Masonry program. An average grade of 3.64 in the Health Careers program in next highest. Manufacturing Technology is ranked in third place with an average grade of 3.62. The next lower average grade of 3.58 occurred among students in the Welding program. In the Culinary Arts program, the average grade was 3.5, followed by Pre-Engineering Technology with an average grade of 3.58. There were 2 programs that have the same average grade of 3.25: Air Conditioning/Refrigeration and Automotive Technology programs. Rank number eight in student grade average of 3.15 is in the Drafting program. Meanwhile, in the Cosmetology program students' grade average was 2.71, followed by an average grade of 2.66 in the Residential/Commercial Construction program. The lowest grade average was 2.25 in the Collision Repair Technology program. The average grade of the completers in every program is shown on Table X below.

Table IX

Average grade of secondary student completers based on 4.0 being the highest a student can achieve

Name of program	Grade average
Masonry	3.66
Health Careers	3.64
Manufacturing Technology	3.62
Welding	3.58
Culinary Arts	3.50
Pre-Engineering Technology	3.45
Air Conditioning/Refrigeration	3.25
Automotive Technology	3.25
Drafting	3.15
Cosmetology	2.71
Residential/Commercial Construction	2.66
Collision Repair Technology	2.25
Mean/average	3.22

Programs and PLAN test scores

There are five PLAN test scores available: English, mathematics, reading, science, and a composite of all PLAN scores. The scores given is between 1, for the lowest score, and 32 the highest score participants can achieve. English measures the understanding of standard written English such as punctuation; usage of grammar; structure of the sentence; and usage of strategy, organization, and style in writing. Secondary program completers in the 2005-2007 school years had an average English score of 15.2, with the lowest average score of 9, occurring in the Air Conditioning/Refrigeration program and the highest average score of 20.3 in Culinary Arts. The mathematics score measures mathematical reasoning and non-memorized formulas, typically in pre-algebra, first-year algebra, and geometry. The average score of PLAN test in mathematics was 16, with the lowest average score of 10.6 in the Masonry program and the highest average score of 10.2 in Manufacturing Technology. The reading score measures capability in comprehension with concentration in the social sciences, humanities, and prose fiction. The PLAN reading score average was 14, with a score of 12 being the lowest in Collision Repair Technology, and a score 17.5 being the highest in Automotive Technology. The science score measures scientific reasoning skills in the topics of biology, chemistry, physics, geology, astronomy, and meteorology. For the PLAN science test, the average score was 17. Students in Air Conditioning/Refrigeration had the lowest average of 14.5, and students in Drafting had the highest average of 19.1. Finally, the total average PLAN test scores of secondary student completers for the 2005-2007 school years were 12.8. Students in the Masonry program and Air Conditioning/Refrigeration had the lowest overall PLAN test score

(12.8), and students in Culinary Arts had the highest overall PLAN test score (18). In every program, the average scores of each subject and the final average of each subject are shown and arranged in a manageable table form of data (table X).

Table X

Average of student PLAN scores in each program

	Average PLAN scores of				
Name of program	English	Mathematics	Reading	Science	Composite
Culinary Arts	20.3	18.6	15.6	17.6	18
Manufacturing Technology	17.2	19.2	14.6	18.2	17.3
Drafting	17	15.6	17.5	19.1	17.3
Cosmetology	17.5	16.5	16.3	17.7	17
Automotive Technology	16.3	17	16.4	17.8	16.8
Pre-Engineering Technology	15.7	17	14.2	17.9	16.2
Health Careers	15.4	16	15.8	17.1	16
Collision Repair Technology	15.8	15.8	12	16.8	15.1
Residential/Commercial Construction	13.5	15	14.8	16	14.8
Welding	12	16.3	14.6	15.8	14.6
Air Conditioning/Refrigeration	9	15	13	14.5	12.8
Masonry	13	10.6	12.3	15.6	12.8
Mean/average	15.2	16	14.7	17	15.7

Programs and KeyTrain

At RTC, KeyTrain was given to students as computer based training (CBT). The format is such that students can benefit from interactive multimedia and self-paced learning. Applied mathematics measures the ability to use mathematics in solving problems in the workplace. Meanwhile, locating information measures the ability to understand and gain information from graphics such as charts and tables. Reading for information measures the ability to comprehend common information in the workplace such as memos, letters, procedures, and instructions. In KeyTrain, the lowest level an individual can achieve to be able to function in the workplace is level 3. The highest score is level 7. The overall average level of applied mathematics for secondary completers in 2005-2007 was 4.5, with 4 being the lowest average (Culinary Arts, Masonry, and Welding), and 5 being the highest average (Air Conditioning/Refrigeration, Collision Repair Technology, and Manufacturing Technology). For locating information scores, the overall average was 4.6. The lowest average score was 4 (Manufacturing Technology), and the highest average score was 5 (Air Conditioning/Refrigeration, Automotive Technology, and Collision Repair Technology). In reading for information, the overall average score was 4.5. The lowest average score was 3.6 (Culinary Arts), and the highest average score was 5.5 (Cosmetology).

Table XI

Programs and the average KeyTrain scores

	Average KeyTrain scores		
Name of program	Applied math	Locating info	Reading for info
Air Conditioning/Refrigeration	5	5	5
Automotive Technology	4.4	5	5
Cosmetology	4.7	4.8	5.5
Collision Repair Technology	5	5	3.8
Culinary Arts	4	4.6	3.6
Drafting	4.7	4.4	4.9
Health Careers	4.1	4.7	5
Masonry	4	4.3	4.6
Manufacturing Technology	5	4	4.2
Pre-Engineering Technology	4.7	4.2	4.3
Residential/Commercial Construction	4.6	4.6	4.3
Welding	4	4.8	4.6
Mean/average	4.5	4.6	4.5

Programs and WorkKeys

As noted, KeyTrain is a training system to prepare students in taking the actual test, WorkKeys. WorkKeys produces the actual certificate for student completers at RTC. For that reason, KeyTrain and WorkKeys at RTC have similar test items/variables/subjects which are applied mathematics, locating information, and reading for information. Comparable with KeyTrain, the level of these subjects in WorkKeys is also set with level 3; as the lowest level an individual can achieve in order for her/him to be able to function well in an entry level job. The highest possible level an individual can achieve is 7. At RTC, the completers' average score of applied mathematics for 2005-2007 was 4.8. The lowest average was 4.4 (Health Careers program), and the highest average was 5.5 (Air Conditioning/Refrigeration). In locating information, the completers' overall average score was 3.9. The lowest average was 3.3 (Masonry program), and the highest average was 4.5 (Air Conditioning/Refrigeration program). For reading for information, the overall average score for completers was 4.5. The lowest average score was 4.1 (Residential/Commercial Construction program), and the highest average score was 4.8 (Cosmetology program).

Table XII

Programs and the average WorkKeys scores

	Average scores of WorkKeys		
Name of program	Applied math	Locating info	Reading for info
Air Conditioning/Refrigeration	5.5	4.5	4.5
Automotive Technology	4.8	4	4.4
Cosmetology	4.6	3.8	4.8
Collision Repair Technology	5.2	3.7	4.7
Culinary Arts	5	4.3	5
Drafting	5	3.7	4.4
Health Careers	4.4	3.8	4.7
Masonry	4.6	3.3	4
Manufacturing Technology	5.4	4	4.6
Pre-Engineering Technology	4.9	4.1	4.7
Residential/Commercial Construction	4.8	4.1	4.1
Welding	4.5	3.8	4.3
Mean/average	4.8	3.9	4.5

The general profile of secondary student completers for the school years 2005-2006 and 2006-2007

The profile of secondary student completers was as follows:

1. Students had an attendance rate of 93.1 percent with the standard deviation of 5.8.
2. Students had average grade of 3.3 with the standard deviation of 0.7.
3. Students had average PLAN test scores of:
    a. English 15.7 with the standard deviation of 4.4
    b. Mathematics 15.3 with the standard deviation of 4.1
    c. Reading 15.3 with the standard deviation of 3.8
    d. Science 17.4 with the standard deviation of 3
    e. Composite 16.3 with the standard deviation of 3.1
4. Students had average KeyTrain scores of:
    a. Mathematics 4.5 with the standard deviation of 1
    b. Locating Information 4.7 with the standard deviation of 0.8
    c. Reading for Information 4.7 with the standard deviation of 1
5. Students had average WorkKeys scores of:
    a. Mathematics 4.8 with the standard deviation of 1.2
    b. Locating Information 3.9 with the standard deviation of 0.6
    c. Reading for information 4.6 with the standard deviation of 1

Table XIII

Profile of secondary completers for the years 2005-2006 and 2006-2007

Factors	Average	Standard Deviation
Attendance	93.1%	5.8
Grades	3.3	0.7
PLAN English	15.7	4.4
Mathematics	15.3	4.1
Reading	15.3	3.8
Science	17.4	3.0
Composite	16.3	3.1
KeyTrain Mathematics	4.5	1.0
Locating Information	4.7	0.8
Reading for Information	4.7	0.9
WorkKeys Mathematics	4.8	1.2
Locating Information	3.9	0.6
Reading for Information	4.6	1.0

Table XIV

List of average WorkKeys in each program and recommended WorkKeys

Name of program	Applied Mathematics	Locating information	Reading for information
Air Conditioning/Refrigeration			
Average WorkKeys scores	5.5	4.5	4.5
Recommended WorkKeys	4	4	5
Automotive Technology			
Average WorkKeys scores	4.8	4	4.4
Recommended WorkKeys	4	4	4
Cosmetology			
Average WorkKeys scores	4.6	3.8	4.8
Recommended WorkKeys	4	4	5
Collision Repair Technology			
Average WorkKeys scores	5.2	3.7	4.7
Recommended WorkKeys	3	3	3

Table XIV—part 2

Culinary Arts			
Average WorkKeys scores	5	4.3	5
Recommended WorkKeys	4	5	4
Drafting			
Average WorkKeys scores	5	3.7	4.4
Recommended WorkKeys	5	5	4
Health Careers			
Average WorkKeys scores	4.4	3.8	4.7
Recommended WorkKeys	4	5	5
Masonry			
Average WorkKeys scores	4	4.3	4.6
Recommended WorkKeys	4	4	4
Manufacturing Technology			
Average WorkKeys scores	5.4	4	4.6
Recommended WorkKeys	4	4	4
Pre-Engineering Technology			
Average WorkKeys scores	4.9	4.1	4.7
Recommended WorkKeys	4	4	4

Table XIV—part 3

Residential/Commercial Construction			
Average WorkKeys scores	4.8	4.1	4.1
Recommended WorkKeys	4	4	4
Welding			
Average WorkKeys scores	4.5	3.8	4.3
Recommended WorkKeys	4	4	4

Source: WorkKeys occupational profiles (2008).

Economy status, attendance, and grade

In this study, the economic status is not measured by the parents' income but from the data RTC collected from the students' high schools as to whether the student received a free lunch at school or not. Students who qualified for free lunch at school are assigned with number one, and students who do not receive free lunch at school are assigned with number two.

Since the data of economic status is only available for students in the school year 2006-2007, the analysis will be based on that school year and presented as it is. Table 14 shows the analysis of the school year 2006-2007 only.

Table XV

Economic status and students average attendance and grade for the year 2006-2007

Economic status	Student percentage	Student average attendance	Student average grade
1	24%	90%	2.94
2	76%	92%	3.32

KeyTrain and WorkKeys

Since KeyTrain is a training system for improving basic skills measure by WorkKeys, it will be useful to see whether there is a relation between KeyTrain and WorkKeys.

Table XVI

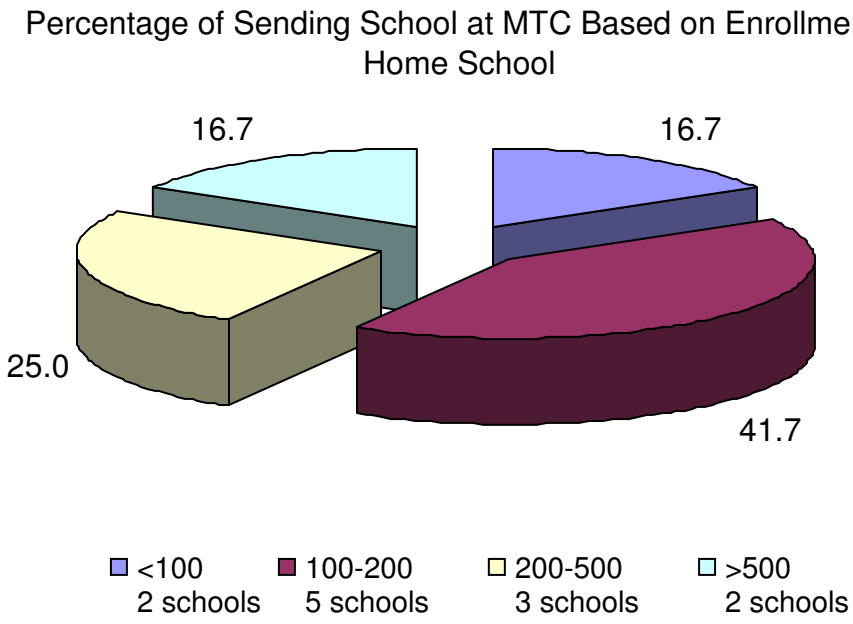
The regression results between KeyTrain and WorkKeys

Dependent variables	Parameters	
	Intercept	β
WorkKeys mathematics	2.099***	0.603***
P- value	<.0001	<.0001
WorkKeys locating information	2.764***	0.249***
P- value	<.0001	<.0013
WorkKeys reading for information	2.172***	<.0514***
P- value	<.0001	<.0001

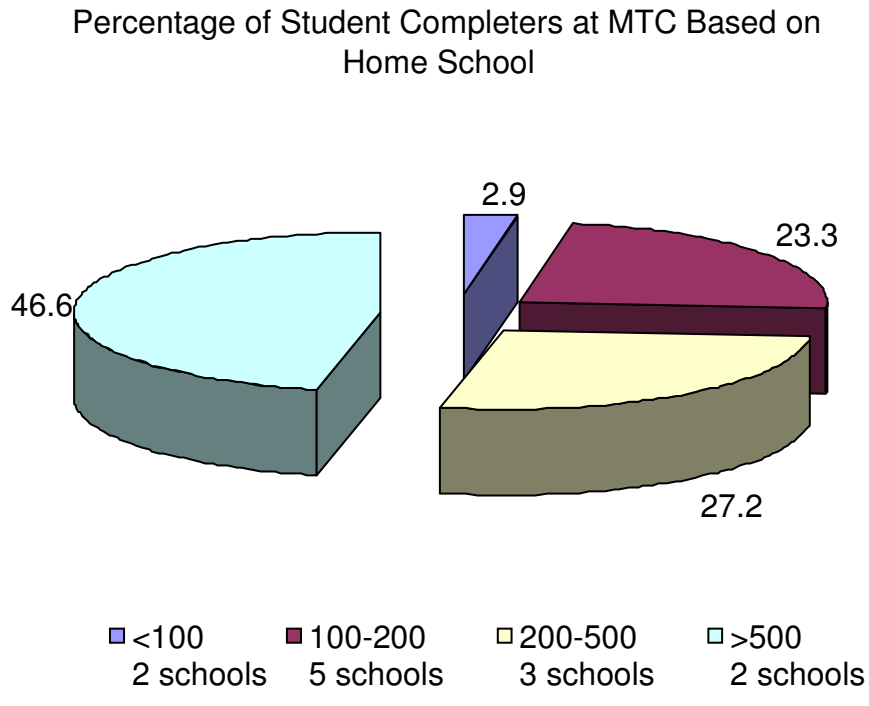
Note: *** indicates that parameters are significant at $\alpha = 0.01$.

Sending Schools

Sending schools were grouped based on the student enrollment. Group I is for student enrollment less than 100: 2 schools. Group II is for student enrollment from 100-200: 5 schools. Group III is for student enrollment from 200-500: 3 schools. Group IV is for student enrollment of more than 500: 2 schools.

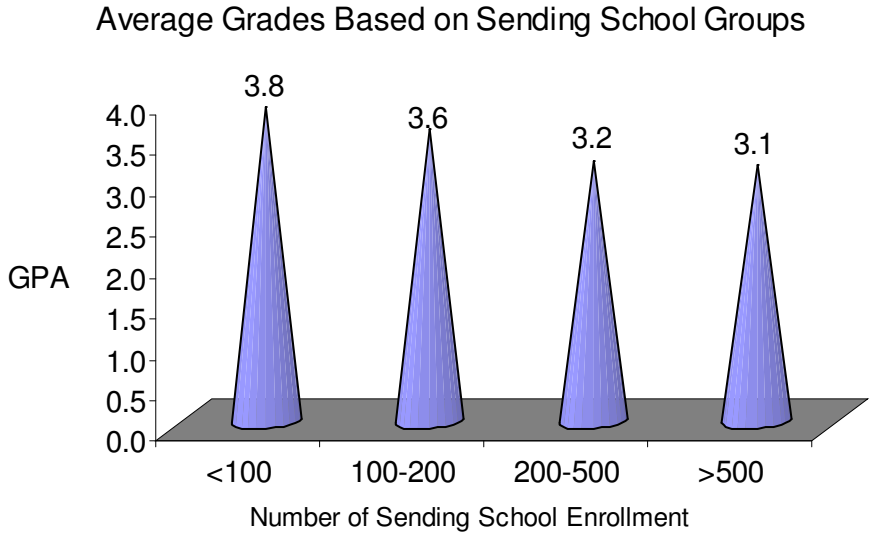


Using the same grouping, a comparison was made of which sending schools had the most completers.



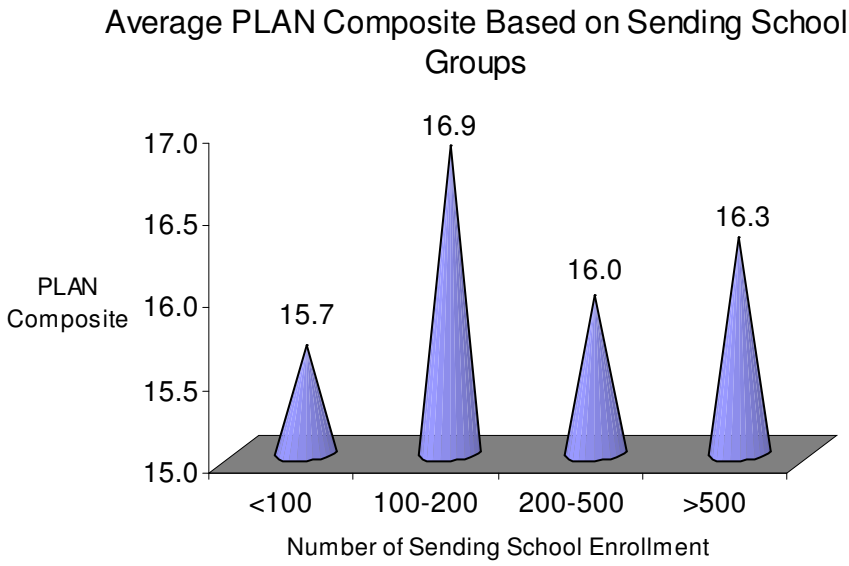
Average grades of students based on sending school groups

The students of sending schools in group I had an average grade of 3.8. The students of sending schools in group II had an average grade of 3.6. The students of sending schools in group III had an average grade of 3.2. The students of sending schools in group IV had an average grade of 3.1.



The average PLAN Composite score based on sending school groups

The average PLAN Composite score of students in sending schools group I was 15.7. The average PLAN Composite score of students in sending schools group II was 16.9. The average PLAN Composite score of students in sending schools group III was 16.0. The average PLAN Composite score of students in sending schools group IV was 16.3.



Conclusion

There are 103 data sets in this study. For the year 2005-2006 there were 65 data sets of 16 pieces each. For the year 2006-2007 there were 38 data sets of 17 pieces each. From the total 103 completers, 42 completers (41%) were females and 61 completers (59%) were males. The overall average and the average of every score in each program in chapter IV are the findings of this study and are going to be used as foundations for the conclusions, discussions, and recommendations in chapter V.

CHAPTER V

CONCLUSION

Conclusion and Discussion

The purpose of this study is to manage and analyze the data that led to the profile and description of secondary student completers at RTC during the school years 2005-2006 and 2006-2007. This study was not designed to uncover reasons why a student might or might not complete a CTE program. Since this research is to discover the characteristics of successful program completers for secondary students at RTC for the school years 2005-2007, the findings may provide input and assistance to RTC administrators on the subject of profiling secondary student completers. The population for this study consisted of all secondary completers who had a complete data set: gender, race, economic disadvantage, sending schools, program, grades, attendance, PLAN scores, KeyTrain scores, WorkKeys scores for the school years 2005-2006 and 2006-2007, and economic consideration for 2006-2007 only. The archival data collected was not as complete as it could be. By the time it was collected, the data was not well organized, thus the process of data collection was as follows:

1. Data collection started with secondary students who completed the programs for the school years 2005-2006 and 2006-2007, and had WorkKeys scores on file. Students who had not taken WorkKeys and those who did not have WorkKeys on file were eliminated from the data collection.

2. PLAN test scores were collected.
3. KeyTrain scores were collected.
4. Attendance records were collected.
5. Grades were collected.
6. Race data was collected. Since race was dominated by 80 percent Caucasian and the rest split among Hispanic (5.7%), Native American (1.9%), Asian/Pacific Islander (4.8), and African American (5.7); race factor was eliminated from the data.
7. Economic status was collected. Since for the school year 2005-2006 RTC did not collect data concerning economic status of the students, the data available was from the school year 2006-2007 only.
8. Students who did not have a complete data set as stated above were eliminated. See table III and IV in chapter IV.

The incomplete data sets of students were eliminated to avoid unfair treatments of the variables and making invalid assumptions in this study.

RTC offers 24 programs during the daytime for secondary students, but secondary student completers in this study completed only 12 programs. This is due to the incomplete data sets of students rendering these sets unusable, as well as programs that lacked secondary students. The original archival data received from RTC for the year 2005-2006 consisting of 17 programs, and the year 2006-2007 consisted of 13 programs. The programs that had secondary students but were not included in this study because of an incomplete data set were:

1. Biotechnology

2. Business Technology
3. Information Technology
4. Precision Metal Fabrication

There was one program in the archival data provided by RTC that had adult students only: Electrical Engineering. The 12 programs included in this study were: Air Conditioning/Refrigeration (ACR), Automotive Technology (AT), Cosmetology (COS), Collision Repair Technology (CRT), Culinary Arts (CA), Drafting (DFT), Health Careers (HC), Masonry (MAS), Manufacturing Technology (MTT), Pre-Engineering Technology (PET), and Welding (WT).

From the findings in chapter IV, the profile and description of secondary student completers in each specific program and in general will be presented. Also, on every table the national average of PLAN test scores in 2005 and recommended WorkKeys for every job will be presented. The 2005 source for national average PLAN scores is obtained from Kentucky Department of Education (2008). The national average PLAN scores in 2005 were: English 15.2, Mathematics 16, Reading 14.7, Science 17, and Composite 15.7. The source for recommended WorkKeys is obtained from KeyTrain.com (2008). The findings of the relation between KeyTrain and WorkKeys will be discussed, and suggestions will be given. Thus, in this chapter, MTC will be provided with:

1. Information regarding the profile and description of secondary program completers in each program
2. Information regarding the profile and description of secondary program completers in general

3. The lists of program completers' average WorkKeys scores compared to the recommended scores.
4. The percentage of sending schools participating at RTC for the years 2005-2007
5. The students' percentage of sending schools participating at RTC for the years 2005-2007
6. The relationship between economic status, attendance, and grade
7. The worth or significance of KeyTrain as curriculum toward WorkKeys assessment
8. Suggestions from the researcher based on the findings and analysis of the data available

Profile of secondary student completers in Air Conditioning/Refrigeration program

This program was dominated (100%) by male students, with an average attendance of 86 percent. The average grade for this program was 3.25, slightly higher than the overall average which was 3.22. The average PLAN test scores in every subject in this program were lower than either the average of the overall program or the national average. PLAN scores average of English was 9, lower than the average of the overall program which was 15.2, and even lower when compared with the national average score of 16.9. PLAN score in mathematics was 15, lower than the average of the overall program of 16 and the national average score of 17.4. . For reading, the average score was 13, lower than the average of the overall of 14.7 and the national average score of 16.9. The score for science was 14.5, lower than either average of the overall program of 17 or the national average score of 18.2. The composite score was 12.8, lower than the

average of the overall program of 15.2 and even worse when compared to the national average score of 17.5. The average of KeyTrain in applied mathematics was 5, in locating information was 5, and in reading for information was 5. The average level of WorkKeys in applied mathematics was 5.5, higher than the average of the overall program of 4.8 and than the recommended WorkKeys of 4. In locating information, the average level was 4.5, higher than the average of the overall program 3.9 and recommended WorkKeys 4. In reading for information the average level was 4.5, the same as the average of the overall of 4.5 and lower than the recommended WorkKeys average of 5 (Table XVII).

From this profile, it appears that RTC relies heavily on PLAN test scores in assessing the ability of students in the area tested. This may be an unwise choice because even though the PLAN scores were low, the average grade in this program was high. One area to consider might be what type of knowledge the PLAN tests measure and what type of knowledge is needed to achieve a grade in the CTE course.

Table XVII

Profile of secondary student completers in Air Conditioning/Refrigeration progam

Profile	ACR average	Average for all programs	National average	Recommended WorkKeys
Gender:				
Female	0%	41		
Male	100%	59%		
Attendance	86%	92%		
Grade	3.25	3.22		
PLAN test scores:				
English	9	15.2	16.9	
Mathematics	15	16	17.4	
Reading	13	14.7	16.9	
Science	14.5	17	18.2	
Composite	12.8	15.2	17.5	
KeyTrain:				
Applied mathematics	5	4.5		
Locating information	5	4.6		
Reading for information	5	4.5		
WorkKeys:				
Applied mathematics	5.5	4.8		4
Locating information	4.5	3.9		4
Reading for information	4.5	4.5		5

Profile of secondary student completers in Automotive Technology

This program had 83 percent male students and only 17 percent female students. The average attendance was 95 percent which was higher than the overall average of all secondary student completers of 92 percent. Grade average in this program was 3.25, a little higher than the overall average of 3.22. Average PLAN English score was 16.3, higher than the overall average of 15.2, but still lower than the national average score of 16.9. In mathematics, the average score was 17, higher than the overall average score of 16, but still lower than the national average score of 17.4. In reading, the average score was 16.4, higher than the overall average of 14.7, but lower than the average of the national score of 16.9. In science, the average score was 17.8, higher than the overall average 17, but lower than the national average of 18.2. For composite, the average score was 16.8, higher than the overall average score 15.7, but lower than the national average score of 17.5. The average level of KeyTrain in applied mathematics was 4.4, lower than the overall average of 4.5. In locating information, the average score was 5, higher than the overall average of 4.6. In reading for information, the average score was 5, higher than the overall average of 4.5. The average level of WorkKeys in applied mathematics was 5.5, higher than both the overall average of 4.8, and the recommended WorkKeys of 4. In locating information the average score was 4, higher than the overall average of 3.9, and had the same scores in reading as the recommended WorkKeys. In this program, although all the PLAN scores were slightly lower than the national average, they were higher when compared with the average for all programs. Also, the average KeyTrain scores and WorkKeys scores were all higher than the average for all programs; even the WorkKeys scores were higher than recommended. Both attendance and grade in

this program were higher than the average for all programs as well. This program had higher PLAN scores than the average and culminated by having high attendance and good grades.

Table XVIII

Profile of secondary student completers in Automotive Technology

Profile	AT average	Average for all programs	National average	Recommended WorkKeys
Gender:				
Female	17%	41%		
Male	83%	59%		
Attendance	95%	92%		
Grade	3.25	3.22		
PLAN test scores:				
English	16.3	15.2	16.9	
Mathematics	17	16	17.4	
Reading	16.4	14.7	16.9	
Science	17.8	17	18.2	
Composite	16.8	15.7	17.5	
KeyTrain:				
Applied mathematics	4.4	4.5		
Locating information	5	4.6		
Reading for information	5	4.5		
WorkKeys:				
Applied mathematics	5.5	4.8		4
Locating information	4	3.9		4
Reading for information	4.4	4.5		4

Profile of secondary student completers in Cosmetology program (COS)

The Cosmetology program had 93 percent female students and 7 percent male students. The average attendance was 90 percent which is lower than the overall average of 92 percent. Also, this program had a lower average grade (2.71) compared to the overall average grade of 3.22. Although the average grade in this program was lower than the overall, all the PLAN test scores averages were higher than the overall average. The PLAN test scores average for English was 17.5, higher than the average for all programs of 15.2, and even higher than the national average of 16.9. For PLAN mathematics the score was 16.5, higher than the overall average of 16, but lower than the national average of 16.9. For PLAN reading the score was 16.3, higher than the overall average of 14.7, but slightly lower than the national average of 16.9. For PLAN science the average was 17.8, higher than the average for all programs of 17, but lower than the national average of 17.5. For PLAN composite the score was 16.8, higher than the overall average of 15.7, but lower than the national average 17.5. The averages of KeyTrain scores were higher than the overall scores. Average KeyTrain score of applied mathematics was 4.7 compared to an overall average of 4.5; average KeyTrain score of locating information was 4.8 compared to an overall average of 4.6; average Keytrain score of reading for information was 5.5 compared to an overall average of 4.5. The WorkKeys averages scores of students in this program in mathematics was 4.6, lower compared with the overall average of 4.8, but higher than the recommended WorkKeys of 4. In WorkKeys locating information the score was 3.8, slightly lower than the overall average of 3.9, and lower than recommended the WorkKeys of 4. In WorkKeys reading

for information the score was 4.8, higher than the overall average 4.5, but lower than the recommended WorkKeys 5.

Students in this program averaged had higher scores in PLAN, KeyTrain, and one of the WorkKeys scores. Almost all of the scores were higher than the overall average except for WorkKeys scores in applied mathematics and locating information, which were slightly lower by 0.2 and 0.1 points consecquatively. However, students' average grade in the Cosmetology program was third from the bottom in rank. With an average attendance of 90 percent, did this mean that the absence represented by the missing 10 percent of the classes had a big effect on student performance? If so, then it might be wise for RTC to encourage students not to miss classes in this program. Or it may be that students were not being served as they should have been. For example, the instructors might fail to pay attention to student learning styles that may differ from each other, or possibly students did not have enough clients to practice with, or students may have been bored with the teaching methodology. These problems might cause students to not want to attend classes.

Table XIX

Profile secondary student completers in Cosmetology program

Profile	COS average	Average for all programs	National average	Recommended WorkKeys
Gender:				
Female	93%	41%		
Male	7%	59%		
Attendance	90%	92%		
Grade	2.71	3.22		
PLAN test scores:				
English	17.5	15.2	16.9	
Mathematics	16.5	16	17.4	
Reading	16.3	14.7	16.9	
Science	17.8	17	18.2	
Composite	16.8	15.7	17.5	
KeyTrain:				
Applied mathematics	4.7	4.5		
Locating information	4.8	4.6		
Reading for information	5.5	4.5		
WorkKeys:				
Applied mathematics	4.6	4.8		4
Locating information	3.8	3.9		4
Reading for information	4.8	4.5		5

Profile of student completers in Collision Repair Technology (CRT)

Students in Collision Repair Technology number 100 percent males. The attendance average was one of the highest at 96 percent, but the grade average was 2.25 which was the lowest among the other 12 programs. The average of PLAN scores for English was 15.8, slightly higher than the overall average of 15.2, but lower than the national average of 16.9. The average of PLAN score for mathematics was 15.8, lower than the overall average of 16, and lower than the national average of 17.4. The average of PLAN score for reading was 12, lower than the overall average of 14.7, and lower than the national average of 16.9. The average of PLAN for science is 16.8, slightly lower than the overall average of 17, and lower than the national average of 18.2. The average of PLAN for composite was 15.1, lower than the overall average of 15.7, and a lot lower than the national average of 17.5. The KeyTrain average of applied mathematics was 5, higher than the overall average of 4.5. The KeyTrain average of locating information was 5, lower than the overall average of 4.6. The KeyTrain average of reading for information was 3.8, lower than the overall average of 4.5. For Workkeys, the average of applied mathematics was 5.2, higher than the overall average of 4.8, and much higher than the recommended 3. WorkKeys locating information, the score was 3.7, slightly lower than the overall average of 3.9, but higher than the recommended of 3. The WorkKeys reading for information the score was 4.7, higher than the overall average of 4.5, also higher than the recommended of 3.

Although this program had one of the highest average attendances, the average grade was the lowest among all programs. The average PLAN test scores were good except for reading which was in the low 12 percentile. Also the KeyTrain score for the

reading for information was low. These low reading scores might affect students' learning which ultimately lowers their grades. Instructors might consider the level of reading needed to be successful in the program such as reading and comprehending manual instructions before practicing on the machinery.

Table XX

Profile secondary student completers in Collision Repair Technology

Profile	CRT average	Average for all programs	National average	Recommended WorkKeys
Gender:				
Female	0%	41%		
Male	100%	59%		
Attendance	96%	92%		
Grade	2.25	3.22		
PLAN test scores:				
English	15.8	15.2	16.9	
Mathematics	15.8	16	17.4	
Reading	12	14.7	16.9	
Science	16.8	17	18.2	
Composite	15.1	15.7	17.5	
KeyTrain:				
Applied mathematics	5	4.5		
Locating information	5	4.6		
Reading for information	3.8	4.5		
WorkKeys:				
Applied mathematics	5.2	4.8		3
Locating information	3.7	3.9		3
Reading for information	4.7	4.5		3

Profile of secondary student completers in Culinary Arts (CA)

The Culinary Arts program had 33 percent female students and 67 percent male students. The average attendance rate was 89 percent, lower than the overall average of 92 percent. The average grade was 3.5, higher than the overall average grade of 3.5. In this program, the PLAN scores average for English was 20.3, higher than the overall average of 15.2, also higher than the national average of 16.9. For mathematics the average score was 18.6, higher than the overall average of 16, and still higher than the national average of 17.4. For reading the average was 15.6, higher than the overall average of 14.7, but lower than the national average of 16.9. For science the average score was 17.6, higher than the overall average of 17, but lower than the national average of 18.2. For composite the average score was 18, a lot higher than the overall average of 15.7, and still higher than the national average of 17.5. The KeysTrain average score for applied mathematics was 4, lower than the overall average of 4.5. For locating information the average score was 4.6, exactly the same score with the overall average of 4.6. For reading for information the average score was 3.6, lower than the overall average of 4.5. The WorkKeys assessment average score for applied mathematics was 5, higher than the overall average of 4.8, also higher than the recommended of 4. For locating information the average was 4.3, higher than the overall average of 3.9, but lower than the recommended of 5.

Table XXI

Profile secondary student completers in Culinary Arts program

Profile	CA average	Average for all programs	National average	Recommended WorkKeys
Gender:				
Female	33%	41%		
Male	67%	59%		
Attendance	89%	92%		
Grade	3.5	3.22		
PLAN test scores:				
English	20.3	15.2	16.9	
MathematicS	18.6	16	17.4	
Reading	15.6	14.7	16.9	
Science	17.6	17	18.2	
Composite	18	15.7	17.5	
KeyTrain:				
Applied mathematics	4	4.5		
Locating information	4.6	4.6		
Reading for information	3.6	4.5		
WorkKeys:				
Applied mathematics	5	4.8		4
Locating information	4.3	3.9		5
Reading for information	5	4.5		4

Profile of secondary student completers in Drafting (DFT)

In this program, 20 percent of the students were females and 80 percent males. Attendance, average was 90 percent, lower than the overall average of 92 percent. The grade point average was 3.1, lower than the overall average of 3.22. The average scores of PLAN test in English were 17, higher than the overall average of 15.2, also lower than the national average of 16.9. In mathematics the average score was 15.6, lower than the overall average of 16, and much lower than the national average of 17.4. In reading, the average score was 17.5, higher than either the average scores for all programs of 14.7 and the national average of 16.9. In science the average score was 19.1, higher than both overall averages of 17 and the national average of 18.2. In composite, the average score was 17.3, lower than both the overall average of 15.7 and the national average of 17.5. The average scores of KeyTrain in applied mathematics was 4.7, higher than the overall average of 4.5. In locating information the average score was 4.4, lower than the overall average of 4.6. In reading for information the average was 4.9, higher than the overall average of 4.5. The average scores of WorkKeys in applied mathematics were 5, higher than the overall average of 4.8, exactly the same with the recommended 5. In locating information the average score was 3.7, lower than the overall average 3.9, also lower than recommended average of 5. For information the average score was 4.4, slightly lower than the overall average of 4.5, but higher than the recommended average of 4.

The average attendance and grade in this program were lower than the overall average; but the average PLAN scores were higher than both the overall average scores and the national average scores, except for the scores on mathematics which were lower.

Since this was a drafting program and strong mathematics skills were needed in order to succeed, the low mathematics score might have caused the low grades.

Table XXII

Profile of secondary student completers in Drafting program

Profile	DFT average	Average for all programs	National average	Recommended WorkKeys
Gender:				
Female	20%	41%		
Male	80%	59%		
Attendance	90%	92%		
Grade	3.1	3.22		
PLAN test scores:				
English	17	15.2	16.9	
Mathematics	15.6	16	17.4	
Reading	17.5	14.7	16.9	
Science	19.1	17	18.2	
Composite	17.3	15.7	17.5	
KeyTrain:				
Applied mathematics	4.7	4.5		
Locating information	4.4	4.6		
Reading for information	4.9	4.5		
WorkKeys:				
Applied mathematics	5	4.8		5
Locating information	3.7	3.9		5
Reading for information	4.4	4.5		4

Profile of student completers in Health Careers (HC)

The Health careers program was dominated by female students at 85 percent, and the remaining 15 percent were male students. Attendance was high in the 95 percentile, higher than the overall average of 92 percent. The average grade was 3.64, also higher than the overall average of 3.22. The PLAN test scores in this program had an average of 15.4 for English, higher than the overall average of 15.2, but lower than the national average of 16.9. For mathematics the average score was 16, equal to the overall average 16, but lower than the national standard of 17.4. For reading the average score was 15.8, higher than the overall average of 14.7, but lower than the national average of 16.9. For science the average score was 17.1, slightly higher than the overall average of 17, but lower than the national average of 18.2. For composite the average score was 16, slightly higher than the overall average 15.7, and a lot lower than the national average 17.5. The KeyTrain average for applied mathematics was 4.1, lower than the overall average 4.5. For locating information the average was 4.7, slightly lower than the overall average 4.6. For reading for information the average score was 5, higher than the overall average 5. The WorkKeys average score for applied mathematics was 4.4, lower than the overall average 4.8, but higher than the recommended 4.

For locating information the average was 3.8, slightly lower than the overall average 3.9, and a lot lower than the recommended 5. For reading for information the average score was 4.7, slightly higher than the overall average 4.5, but lower than the recommended 5. This program had high average attendance, high average grades, higher average PLAN scores than the overall average, and higher KeyTrain scores than the overall average except for applied mathematics which was slightly lower. Nevertheless, the average

WorkKeys scores in locating information and reading for information were lower than recommended for this job area. Recommended WorkKeys scores are used by business and industry in recruiting future employees, hence it is vital for program completers to reach the WorkKeys standard in order to obtain a job. Students may need to practice more in KeyTrain to increase the WorkKeys scores.

Table XXIII

Profile of secondary student completers in Health Careers program

Profile	HC average	Average for all programs	National average	Recommended WorkKeys
Gender:				
Female	85%	41%		
Male	15%	59%		
Attendance	95%	92%		
Grade	3.64	3.22		
PLAN test scores:				
English	15.4	15.2	16.9	
Mathematics	16	16	17.4	
Reading	15.8	14.7	16.9	
Science	17.1	17	18.2	
Composite	16	15.7	17.5	
KeyTrain:				
Applied mathematics	4.1	4.5		
Locating information	4.7	4.6		
Reading for information	5	4.5		
WorkKeys				
Applied mathematics	4.4	4.8		4
Locating information	3.8	3.9		5
Reading for information	4.7	4.5		5

Profile student completers in Masonry (MAS)

This program was 100 percent dominated by males and had the highest attendance average of 96 percent, compared with the overall average of 92 percent. Also, it had the highest grade average of 3.66, compared to the overall average of 3.22. The average PLAN scores for English was 13, much lower than both the overall average of 15.2 and the national average of 16.9. For mathematics the average score was 10.6, a lot lower than both the overall average of 16 and the national average 17.4. For reading the average score was 12.3, much lower compared with the overall average of 14.7 and the national average of 16.9. For science the average score was 15.6, lower than the overall average of 17, also lower than the national average 18.2. On the composite total the average score was 12.8, a big gap from the overall average 15.7 and the national average 17.5. The average of KeyTrain scores in applied mathematics was 4, a little lower than the overall average 4.5. In locating information the average was 4.3, somewhat lower than the overall average 4.6. In reading for information the average was 4.6, only slightly higher than the overall average 4.5. The average of WorkKeys scores in applied mathematics was 4.6, slightly lower than the overall average 4.8, but higher than recommended 4. In locating information score average was 3.3, lower than the overall average 3.9, and lower than the recommended 4. In reading for information the average score was 4, lower than the overall average 4.5, and the same with the recommended 4. Students in this program had lower average scores in PLAN than students in other program areas, but the attendance rate and the average grade were the highest among all programs reviewed. This demonstrates that low academic achievement in PLAN test scores does not hinder these students in learning and achieving high scores on the CTE

course. This finding aligns with Plank's (2001) theory that students who find academic courses uninteresting and not as challenging as CTE courses achieve higher grades in CTE classes.

Table XXIV

Profile of secondary student completers in Masonry program

Profile	MAS average	Average for all programs	National average	Recommended WorkKeys
Gender:				
Female	0%	41%		
Male	100%	59%		
Attendance	96%	92%		
Grade	3.66	3.22		
PLAN test scores:				
English	13	15.2	16.9	
Mathematics	10.6	16	17.4	
Reading	12.3	14.7	16.9	
Science	15.6	17	18.2	
Composite	12.8	15.7	17.5	
KeyTrain:				
Applied mathematics	4	4.5		
Locating information	4.3	4.6		
Reading for information	4.6	4.5		
WorkKeys:				
Applied mathematics	4.6	4.8		4
Locating information	3.3	3.9		4
Reading for information	4	4.5		4

Profile of student completers in Manufacturing Technology (MTT)

This program is dominated 100 percent by male students. The average attendance was 94 percent, higher than the overall average of 92 percent. The average grade was 3.62, higher than the overall average of 3.22. The PLAN test scores average for English was 17.2, higher than both the overall average of 15.2 and the national average of 16.9. For mathematics the average score was 19.2, markedly higher than either the overall average of 16 or the national average of 17.4. For reading the average score was 14.6, only slightly lower than the overall average of 14.7, but much lower than the national average of 16.9. For science the average score was 18.2, higher than the overall average of 17, and the same as the national average 18.2. For the composite total the average score was 17.3, higher than the overall average of 15.7, but slightly lower than the national average of 17.5. The KeyTrain average score in applied mathematics was 5, higher than the overall average of 4.5. In locating information the average score was 4, lower than the overall average of 4.6. In reading for information the average score was 4.2, somewhat lower than the overall average of 4.5. The WorkKeys average scores in applied mathematics was 5.4, higher compared to both the overall average of 4.8 and the recommended 4. In locating information the average score was 4, one-tenth of a point higher than the overall average of 3.9, and exactly the same as the recommended average 4. In reading for information the average score was 4.6, higher than either the overall average of 4.5 or the recommended average of 4.

Students came to this program with strong basic skills in both academics and applicable knowledge. They had high average PLAN scores, high KeyTrain scores, and completed the program with good results as well. Both the attendance and the average

grades were high. Students' strong aptitude in both academic and applied knowledge may have resulted in this very good outcome. One concern needing attention is that the average score of WorkKeys for locating information was much lower than the recommended score. Since KeyTrain is proven to be an effective curriculum to achieve high scores in WorkKeys, students in this program may need intensive practice in KeyTrain, especially in the locating information subject to increase their scores.

Table XXV

Profile of secondary student completers in Manufacturing Technology

Profile	MTT average	Average for all programs	National average	Recommended WorkKeys
Gender:				
Female	0%	41%		
Male	100%	59%		
Attendance	94%	92%		
Grade	3.62	3.22		
PLAN test scores:				
English	17.2	15.2	16.9	
Mathematics	19.2	16	17.4	
Reading	14.6	14.7	16.9	
Science	18.2	17	18.2	
Composite	17.3	15.7	17.5	
KeyTrain:				
Applied mathematics	5	4.5		
Locating information	4	4.6		
Reading for information	4.2	4.5		
WorkKeys:				
Applied mathematics	5.4	4.8		4
Locating information	4	3.9		4
Reading for information	4.6	4.5		4

Profile of student completers in Pre-Engineering Technology (PET)

Female students in this program comprised 10 percent of the enrollees while male students accounted for 90 percent. The average attendance was 95%, higher than the overall average of 92%. The grade average was 3.45, somewhat higher than the overall average of 3.22. The PLAN test average for English was 15.7, slightly higher than the overall average of 15.2, but much lower than the national average 16.9. For mathematics the average score was 17, 1 point lower than overall average of 16, and slightly lower than the national average of 17.4. For reading the average score was 14.2, slightly lower than the overall average of 14.7, but almost two points lower than the national average of 16.9. For science the average score was 17.9, higher than the overall average of 17, but lower than the national average of 18.2. For the composite total the average score was 16.2, higher than the overall average of 15.7, but lower than the national average score of 17.5. The KeyTrain average score for applied mathematics was 4.7, lower than the overall average of 4.5. For locating information the average score was 4.2, lower than the overall average of 4.6. For reading for information the average score was 4.3, lower than the overall average of 4.5. The WorkKeys average score for applied mathematics was 4.9, slightly higher than the overall average of 4.8, but almost a full point higher than the recommended of 4. For locating information the average score was 4.1, slightly higher than the overall average of 3.9, but only slightly higher than the recommended of 4. For reading for information the average score was 4.1, lower than the overall average of 4.5, but slightly higher than the recommended of 4.

In this program, students had good PLAN test scores and KeyTrain scores which equipped them to be good starters to enter the program. Combined with a high

percentage in attendance, the average grade in this class was high as well. The success of students in this program may be due to the strong aptitude of students from the beginning.

Table XXVI

Profile of secondary student completers in Pre-Engineering Technology program

Profile	PET average	Average for all programs	National average	Recommended WorkKeys
Gender:				
Female	10%	41%		
Male	90%	59%		
Attendance	95%	92%		
Grade	3.45	3.22		
PLAN test scores:				
English	15.7	15.2	16.9	
Mathematics	17	16	17.4	
Reading	14.2	14.7	16.9	
Science	17.9	17	18.2	
Composite	16.2	15.7	17.5	
KeyTrain:				
Applied mathematics	4.7	4.5		
Locating information	4.2	4.6		
Reading for information	4.3	4.5		
WorkKeys:				
Applied mathematics	4.9	4.8		4
Locating information	4.1	3.9		4
Reading for information	4.1	4.5		4

Profile of student completers in Residential/Commercial Construction (RCC)

All students enrolled in this program were male. The average attendance was 91 percent, slightly lower than the overall average of 92 percent. The average grade was 2.66, lower than the overall average of 3.22. For the PLAN test scores, the average in English was 13.5, much lower than both the overall average of 15.2 and the national average of 16.9. The average in mathematics was 15, lower than both the overall average 16 well below and the national average of 17.4. The average score in reading was 14.8, barely higher than the overall average of 14.7, but almost two points lower than the national average of 16.9. In science the average score was 16, one point lower compared to the overall average of 17 and two points the national average of 18.2. The average on the total composite score was 14.8, lower than the overall average of 15.7 and almost three points lower than the national average of 17.5. For the KeyTrain, the average score for applied mathematics was 4.6,only one-tenth of a point higher than the overall overage of 4.5. For the locating information the average score match the overall average of 4.6. For the reading for information the score was 4.3, lower than the overall average of 4.5. For the WorkKeys, the average score for applied mathematics and the overall average was the same 4.8, higher than the recommended of 4. For locating information the average score was 4.1, slightly higher than the overall average of 3.9, but only slightly higher than the recommended of 4. For reading for information the average was 4.1, lower than the overall average of 4.5, but still somewhat higher than the recommended of 4.

With their average PLAN scores lower than the overall average, even much lower than the national average scores, these students were already at a disadvantage when

starting this program. They also performed poorly in this class. The average attendance was low compared with the overall average; even the average grade was second from the bottom in range. Further research could be conducted to possibly uncover some factors which are leading to the less than desirable outcome.

Table XXVII

Profile of secondary student completers in Residential/Commercial Construction

Profile	RCC average	Average for all programs	National average	Recommended WorkKeys
Gender:				
Female	0%	41%		
Male	100%	59%		
Attendance	91%	92%		
Grade	2.66	3.22		
PLAN test scores:				
English	13.5	15.2	16.9	
Mathematics	15	16	17.4	
Reading	14.8	14.7	16.9	
Science	16	17	18.2	
Composite	14.8	15.7	17.5	
KeyTrain:				
Applied mathematics	4.6	4.5		
Locating information	4.6	4.6		
Reading for information	4.3	4.5		
WorkKeys:				
Applied mathematics	4.8	4.8		4
Locating information	4.1	3.9		4
Reading for information	4.1	4.5		4

Profile of student completers in Welding

The welding program was dominated 100 percent by males. The average class attendance was 90 percent, lower than the overall average 92 percent. The average grade was 3.58, higher than the overall average 3.22. The average PLAN test scores for English was 12, much lower than both the overall average of 15.2 and almost 5 points lower than the national average of 16.9. For mathematics the average score was 16.3, slightly higher than the overall average of 16, but over a full point lower than the national average of 17.4. For reading the average score was 14.6, slightly lower than the overall average of 14.7, but three and a half points lower than the national average of 18.2. For science the average score was 15.8, lower than both the overall average of 17 and much lower than the national average of 18.2. For the composite total score the average score was 14.6, lower than the overall average of 15.7, and almost three points lower than the national average of 17.5. The average KeyTrain scores for applied mathematics was 4, lower than the overall average of 4.5. For locating information the average score was 4.8, slightly higher than the overall average of 4.6. For reading for information the overall average was 4.6, slightly higher than the overall average of 4.5. The average WorkKeys scores for applied mathematics was 4.5, slightly lower than the overall average of 4.8, but higher than the recommended of 4. For locating information the average score was 3.8, slightly lower than the overall average of 3.9, also lower than the recommended of 4. For reading for information the average score was 4.3, lower than the overall average of 4.5, but higher than the recommended of 4.

In this class, the average attendance was lower than the overall average, but the average grade has higher than the overall average. The PLAN score in mathematics was

the highest among other subjects, but the score on applied mathematics in KeyTrain was the lowest among other subjects. The WorkKeys score on applied mathematics was the highest score among other subjects. This means that although a student possesses strong concepts in mathematics, s/he might not know how to apply these concepts in a real workplace, yet this ability is trainable. A concern in this program was that the average score in WorkKeys locating information was lower than the recommended average score. Since recommended WorkKeys scores are widely used by business and industry in their recruitment system, this concern might cause students difficulty in finding jobs.

Table XXVIII
Profile of secondary student completers in Welding

Profile	WT average	Average for all programs	National average	Recommended WorkKeys
Gender:				
Female	0%	41%		
Male	100%	59%		
Attendance	90%	92%		
Grade	3.58	3.22		
PLAN test scores:				
English	12	15.2	16.9	
Mathematics	16.3	16	17.4	
Reading	14.6	14.7	16.9	
Science	15.8	17	18.2	
Composite	14.6	15.7	17.5	
KeyTrain:				
Applied mathematics	4	4.5		
Locating information	4.8	4.6		
Reading for information	4.6	4.5		
WorkKeys:				
Applied mathematics	4.5	4.8		4
Locating information	3.8	3.9		4
Reading for information	4.3	4.5		4

The profile of a secondary student completer

From table XIV, the secondary student completer can be profiled as a student who had:

1. Attendance ranging from 87.3 to 98.9 percent
2. Grade ranging from 2.6 to 4
3. PLAN scores of:
    a. English ranging from 11.3-20.1
    b. Mathematics ranging from 11.2-19.4
    c. Reading ranging from 11.5-19.1
    d. Science ranging from 14.4-20.4
    e. Composite ranging from 13.2-19.4
4. KeyTrain scores of:
    a. Mathematics ranging from 3.5-5.5
    b. Locating Information ranging from 3.9-5.5
    c. Reading for Information ranging from 3.8-5.6
5. WorkKeys scores of:
    a. Mathematics ranging from 3.6-6
    b. Locating Information ranging from 3.3-4.5
    c. Reading for Information ranging from 3.6-5.6

This profile shows the scoring range of secondary student completers in factors/characteristics included in this study. In general, this range could be useful for examination by RTC and beneficial for the institution to have the description of its student completers. Using the ranges of PLAN and KeyTrain scores as criteria with incoming students can be helpful for the RTC to offer assistance to students who are

below average score or in the bottom range to help increase the skills they need. The bottom numbers in these scoring ranges appear to be average (not too high) and achievable for students with average aptitude. It is important to note that for WorkKeys scores, students in each program need to achieve the scores recommended by WorkKeys for the job in that area.

WorkKeys scores in each program and the WorkKeys recommended scores

For Workkeys scores in mathematics and in reading for information, the average in each program were higher than the recommended. Nonetheless, for locating information, some programs had a lower average than the recommended. These programs were Cosmetology, Drafting, Health Careers, and Welding. Recommended WorkKeys scores become have both a national and state standard for measuring and communicating basic workplace skills. They are used by the employers to screen their future employees. Students who score lower than the recommended WorkKeys may encounter some difficulty in their job search. Since in this study KeyTrain has proven to be an effective training program for WorkKeys, it is essential for students with lower than recommended scores of WorkKeys to increase their scores by giving more time and practice on the subjects in Keytrain curriculum.

Economic status, attendance, and grade

Since RTC did not collect the economic status data of students for the year 2005-2006, the data of economic status of students was only available for the school year 2006-2007 only. Based on the data for that year, 24 percent were eligible for free lunch at

school compared with 76 percent who were not eligible. This finding does not align with NAVE's (2004) statement in chapter two that CTE students typically come from low income families. From table 13, the findings are that the average attendance and grade of the later students were higher than the first group of students. This might be caused by students' absences since lower economic status students might need to work in order to cover their basic need for food and shelter, as in first step of Maslow's hierarchy theory. Although the students' average attendance and grade in this category were lower than students with a higher economic status, their actual average grade was still good (2.94).

Each technology center receives the majority of its funding from the property taxes of the locale. This technology center has a higher tax base than other technology centers in the state. Correspondingly the number of lower income families is lower than the national average.

Sending schools

Percentage of sending schools based on their enrollment

Sending schools were categorized into 4 groups based on the total enrollment for the year 2007-2008. Since there were 12 sending schools in this study, and to make an even distribution, they were grouped as: group I with an enrollment less than 100 (2 schools) that made up 16.7 percent of the total. Group II with an enrollment from 100-200 (5 schools) that made up 41.7 percent of the total. Group III with an enrollment from 200-500 (3 schools) that made up 25 percent of the total. Group IV with an enrollment from 500 and up (2 schools) that made up 16.7 percent of the total. Originally there were 18 sending schools in the first data collection, but 6 of them were not included in this

study because their students did not have a complete set of data. Thus, these schools were not represented in this study. In the case that these 6 sending schools were included, a change may occur not only in the proportion of the schools represented in this study, but also a more accurate profile of the student completers may emerge.

Percentage of student completers based on the group of the sending schools

2 schools in group I have 2.9 percent completers (3 students of 103). 5 schools in group II have 23.3 percent completers (24 students of 103). 3 schools in group III have 27.2 percent completers (28 students of 103). 2 schools in group IV have 46.6 percent completers (48 students of 103). The student completers did not represent the sending schools equally due to the missing data of some students. Hence, in this study the percentage of student completers did not necessarily signify the sending schools as they could possibly.

Average grades based on the group of the sending schools

The findings show that the average grade of the sending schools in group I was the highest at 3.8. It was followed by the sending schools in group II with the average grade of 3.6. The next is sending schools group III with an average grade of 3.2. The lowest average grade 3.1 was from the sending schools in group IV. The trend was that schools with the lowest enrollment had the highest average grades. The higher the student enrollment, the lower the average grade. There is a possibility that schools with small numbers of students pay more attention to the needs of the students, and assistance were available anytime for them because the ratio of students to counselors was low.

Average of PLAN composite scores based on the group of the sending school

Sending schools in group I had the lowest average composite score of 15.7. Group II has the highest average composite score of 16.9. Group III has the average composite of 16, and group IV has the average composite of 16.3. Both grade and PLAN composite scores in group II were high. The average grade was 3.6, higher than the overall average of 3.22. Also, the average PLAN composite score of 16.9 was higher than the overall average of 15.7. In this study sending schools in group II which had an enrollment from 100-200 achieved the best scores compared with other groups. Except for group II, the rest of the groups tended to score lower for sending schools with lower enrollment. This trend showed an opposite pattern with that of the trend of grade. The grade trend was that the smaller the number of enrollment in sending schools, the higher the grade average. But for the PLAN composite scores, the trend was that the smaller the number of enrollment in sending schools, the lower the scores, with one exception for the sending school group II which had the highest average score of 16.9.

Relationship between KeyTrain and WorkKeys based on Regression results

KeyTrain is "a set of curriculum that covers the same skills as the WorkKeys assessments" (KeyTrain.com, p. 1). KeyTrain is used by MTC's students to practice and improve the skills needed for jobs such as those recommended by WorkKeys. KeyTrain was given to students at the first semester. WorkKeys was given to students after they completed the programs. WorkKeys assessment is part of the WorkKeys employment system. "The system can measure the skills of individuals and the skill requirements of specific jobs. In this way, organizations can determine if individuals have the basic skills that are required to be successful in a specific job" (KeyTrain.com, p. 1). At RTC the

skills measured by KeyTrain and WorkKeys are the same: applied mathematics, locating information, and reading for information. Thus, it is assumed or expected that if KeyTrain scores increase, WorkKeys scores will increase as well.

The results from table 14 indicate that all three variables of KeyTrain have positive signs of parameters. Those three variables were also statistically significant at 1% level. The first regression between Workkeys mathematics as a dependent variable against KeyTrain mathematics as an independent variable gives $\beta = 0.603$, meaning that every time the Keytrain mathematics score increases by 1 unit, it will increase the WorkKeys mathematics score by 0.603 unit. The second regression between WorkKeys locating information as a dependent variable against KeyTrain locating information as an independent variable gives $\beta = 0.249$, meaning that every time the KeyTrain locating information score increases by 1 unit, it will increase the WorkKeys locating information score by 0.249 unit. The last regression between WorkKeys reading for information as a dependent variable against KeyTrain reading for information as an independent variable gives $\beta = 0.514$, meaning that every time KeyTrain reading for information score increases by 1 unit, it will increase WorkKeys reading for information score by 0.514 unit. Hence, it can be concluded that KeyTrain as a curriculum program has a positive impact on WorkKeys scores. KeyTrain can be used to increase WorkKeys scores.

Recommendations and Future research

This study concerns managing and analyzing students' data to discover the profile of secondary student completers. Besides profiling student completers, the findings also can be used to discuss student success. In CTE, student success can be determined not only from student achievement such as completing the programs, but also achievement in

both academic and skills performance such as in grades. The other student success factor in CTE is the engagement of students in class such as attendance and focus on the chosen program.

Relying heavily on PLAN test scores for student placement was not very helpful for students because PLAN tends to measure academic knowledge, and in CTE classes students learned more applicable skills and work-based/hands-on experience. The class environments such as the instructors, curriculum, tools/machinery, and teaching and learning style could possibly influence more strongly aspects in student success. These dilemmas could be seen in some programs such as:

1. Cosmetology, where the average PLAN scores were high, but the average grade was low.
2. Collision Repair Technology, where the PLAN scores were high except for reading, but the average grade was the lowest among other programs.
3. Masonry, where the PLAN scores were low, but this program had the highest grade average and attendance.
4. Welding, where the PLAN scores were low, but the average grades were high.

Besides using PLAN scores, submitting a series of essays, and using interviews as techniques in students' placement, an open house for future students can be an eye-opening experience for prospective students. RTC might open its doors for prospective students to spend times with the instructors in the classroom to gain an idea of what they might learn in the program, and what kinds of tools/machinery they are going to work with. Also, students might need some kind of internship and visit with employers on the job before choosing a program. This would give students some reality about the

activities they are going encounter or job they are heading toward. It will help students in making the right decision regarding career choice. Likewise, Stone and Alfred (2004) identify that career pathways and work-based learning are two elements in CTE programs that are preventing students from dropping out, because these help students understand their future career. Schools that offer work-based learning such as internships, job shadowing, etc. would likely reduce the dropout rate by as much as 30 percent.

Bridgeland et.al (2006) mentioned that dropout students did not make their decision abruptly. It was a gradual process starting with disengagement with the subject in classes and then missing many days in school. Therefore, in order to prevent students from dropping out, instructors need to pay attention to see if any of the students show these kinds of problems before it is too late. Help from adults should be available for students whenever needed.

Putting theories into practice is not an easy job for the instructors of CTE courses. Teaching routinely year after year may develop a degree of stagnation for instructors in their teaching styles and in managing the class even without them realizing it. Instructors at RTC are prepared in a different manner than traditional academic teachers. Many CTE teachers "enter the profession with certification based on occupational experience rather than through teacher education degree programs" (Crawford, 2000, p. 20). With no background in formal teacher education and experience in teaching, these CTE teachers are placed into the classroom. Hence, professional development is a refreshing start for instructors. Professional development can occur in the form of activities such as consultation, seminars, training, visiting other schools, etc. Learning a new development theory of teaching and learning style, exploring new teaching techniques or new

curricula, learning new skills and technology, and refining classroom management can be used as part of professional development for instructors. Inputs from students are important; it can be seen as seeing the classroom from different eyes, and this kind of reflection can improve teaching. Also, teacher action research may be a good way to discover the strengths and weaknesses of the classroom situation. Any professional development that leads to improved student achievement and success not only in terms of completing the program, but also in achieving higher rates of attendance, higher grades, and higher rates of job placement should be taken into consideration.

Since the sample in this study comes from 12 programs of 24 programs offered by RTC, the findings might not be as accurate as if the sample came from all programs. This may be due to the programs with adult students only or programs with missing student data. Also, it may produce a better study if more data were obtained in regard not only to the total of the sample (n), but more data on characteristics of the students as well. Thus, the profile of students could be described more extensively and completely. To strengthen the data collection, it should start with complete and organized data that can be properly collected and used. Archival data in the excel form will be the easiest to manage, read, interpret, present the big picture, make comparisons, and generate conclusions. Some other methods/forms that suit better to organize and keep the students data in one place need to be explore. To do this it might require such a professional development for administrators in charge, or a trusted independent consultant to be hired to do the job professionally. Managing the students' data professionally helps the managements tracking the students' records for whatever data is needed.

Summary

This study overall was to describe the characteristics of secondary student completers at RTC for the 2005-2007 school years. As a workforce source for business and industry, it is important for RTC to supply its clients with skillful workers. However, with only 77 percent of its secondary students completing the programs, RTC needs to know the characteristics of its graduates based on the collected students' data. Managing large collections of data coming from multiple sources can be problematic. The need to use and understand large data sets, such as the data presented in this study, is imperative for programs to improve and keep pace with a rapidly changing workplace.

High school and RTC counselors could use the findings in this study to consult students interested in taking CTE courses at RTC. CTE courses lead students to their future career pathways, thus, students need to choose their programs wisely. Students need to know their own interests and abilities to do the job in classes and in the real work situation. From the profile of student completers, it is clear that to be successful in CTE courses students need to possess these basic skills/aptitude such as in English (PLAN English score minimum of 11.3), mathematics (PLAN mathematics minimum score of 11.2), reading (PLAN score minimum of 11.5), science (PLAN score minimum of 14.4), and composite of total score of PLAN minimum of 13.2). It does not mean that future students with average PLAN scores below the profile of program completers would not be able to complete the program, but the counselors and instructors could monitor these students closely and offer the assistance they need sooner. Besides aptitude in these areas, future students also need to know that successful program completion of CTE courses at RTC requires interest of students, high attendance (minimum of 87.3 percent),

and high grades (minimum 2.25 of 4.0). Counselors could equip students with all this information, thus, students are aware of the expectations in CTE courses to ensure their success.

In future research, it may be helpful to see why secondary students like to take CTE courses, and which courses they show interest in. Other factors could be researched such as the family, the economic status of parents, the level of parents' education, the rural or urban school, or issues concerning the academic achievement in sending schools, etc. Also, are any secondary students discouraged from attending CTE courses? Who are they and why would this occur?

In addition, research concerning the differences and comparisons among CareerTech schools within and across the state could be useful in order for the schools to learn from each other. The research could focus on the same topics about the profile of student completers in qualitative research in order to have deeper understanding in profiling the characteristics of student completers.

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VITA

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Scope and Method of Study: The purpose of this study was to manage and analyze quantitatively the archived data which would lead to the profile and description of secondary student completers at Redbud Technology Center (RTC). The research question asked: what are the characteristics of successful program completers for secondary students at RTC for the 2005-2006 school years? The basic design approach for this study were descriptive statistics which to establish a baseline for the collusion of and reference for future use of the data RTC has on file. Participants of this study were 103 secondary students at RTC who completed their program in the years 2005-2007; and had a complete set of data of program, gender, attendance, grade, economic status, race, complete scores of Prepare Learn ACT Now (PLAN) test, complete scores of KeyTrain, and complete scores of WorkKeys. Although RTC offers 24 programs to secondary students, participants in this study completed their education from 12 programs only. They were Air Conditioning/Refrigeration, Automotive Technology, Cosmetology, Collision Repair Technology, Culinary Arts, Drafting, Health Careers, Masonry, Manufacturing Technology, Pre-Engineering Technology, Residential/Commercial Construction, and Welding.

Findings and Conclusions: For data analysis, the researcher used archival data provided by RTC. The findings of profile student completers in each program and an overall average program were presented in chapter IV. The secondary student completers for the years 2005-2006 and 2006-2007 can be profiled as students who had (1) attendance ranging from 87.3 to 98.9 percent; (2) grade ranging from 2.6 to 4; (3) PLAN scores of composite total ranging from 13.2 to19.4; (4) Keytrain scores of mathematics ranging from 3.5 to 5.5, locating information ranging from 3.9 to 5.5, reading for information ranging from 3.8 to 5.6; and WorkKeys scores of mathematics ranging from 3.6 to 6, locating information ranging from 3.3 to 4.5, reading for information ranging from 3.6 to 5.6. The need to use and understand large data sets, such as the data presented in this study, is imperative for programs to improve and keep pace with a rapidly changing workplace.

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