

# **Career Technical Students and Post-Secondary Education:**

## **A Hidden Population in the Massachusetts Education System**

The Honors Program

Senior Capstone Project

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## **ABSTRACT**

This research looks into Career-Technical Education in Massachusetts, and what makes these institutions successful. Five career-technical high schools in Massachusetts are highlighted in this capstone project, including Blackstone Valley Regional Vocational Technical High School in Upton, MA, as well as all of the public high schools in the regions. By analyzing standardized test scores and demographics, this project seeks to understand the differences in the way each school is performing academically, and recognizes Blackstone Valley Regional Vocational Technical High School as a positive outlier. The capstone concludes with recommendations of success factors other career-technical high schools can adopt in order to increase the academic performance of their students and their ability to move into post-secondary education and other career paths. Suggestions for additional research are also proposed.

## **INTRODUCTION**

Education as we know it to be in the twenty-first century has shifted and reformed many times since it first became formalized many centuries ago. Throughout the years, education as an institution has mirrored society through major growth, and now exists in many types, including traditional public and private high schools and vocational education. This research will specifically focus on vocational high schools, more commonly referred to today as Career Technical High Schools, and the ways in which they prepare their students for post-secondary

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education. Contrary to long term popular belief that vocational high schools are not as highly regarded as traditional high schools, “Career Technical Education High schools make sure that every student is prepared for college, so that he or she has the choice between college and career, and the option is not taken away because of lack of preparation” (Ardon & Frasar, 2015). This research looks into Career Technical Schools in Massachusetts and the ways in which they facilitate success in their students which are moving into post-secondary education following high school graduation. In addition, this research highlights if these students are, in fact, a population that is overlooked in areas of post-secondary education in Massachusetts.

As a graduate of a Career Technical high school, I have noticed the distinct difference between students coming from a typical public or private school and those coming from vocational high schools. Luckily I was able to break the barrier and completed my undergraduate studies at Bryant University, but not all of my peers have found the same level of success. Through personal experience I have found that there is a difference in the way vocational students are viewed, and they are not thought to be strong contenders in the realm of academics and education. These students can make such a powerful difference in post-secondary education and subsequently the workforce with their technical and professional skills learned through Career Technical Education; there is no reason to hinder them from entering post-secondary education. Career Technical schools are becoming more and more competitive and academically driven, but at the same time colleges/universities are becoming increasingly selective. Career Technical students are becoming increasingly prepared for post-secondary education, but are remaining unable to break the barrier into post-secondary education.

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Wanting to understand why this discrepancy existed, the research first began looking into my initial research question: Are students from Career Technical Education Systems less likely to be admitted into post-secondary education? Through this question the study would analyze five Career Technical high schools and five traditional public high schools to see if there was a difference in the percentages of students accepted into post-secondary education. This research avenue posed many hurdles, though, as administration may not be willing to disclose this information. Additionally, the study contained many varying factors, such as realizing who chooses to apply to post-secondary education and who does not. Further deliberation led me to understand that in order to analyze the high performing Career Technical students, my research had to be focused on the institutions the students are coming from including examining standard measures such as standardized testing and other demographics.

This development led to the current research question: What are the characteristics of successful Career Technical High Schools in Massachusetts, specifically regarding preparing students for post-secondary education? Knowing that some of these schools are successful and prepare their students not only for the work force, but also for post-secondary education, my research shifted to better understand what makes certain schools successful and how other schools can recreate those factors in their institutions.

This project includes both quantitative and qualitative research to collect and analyze data to illustrate the differences in performance of students from Career Technical high schools, followed by a comprehensive analysis of the origin of these differences. This research

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highlights any differences in performance across five schools, and examines what factors create a successful environment in Career Technical Education.

With this capstone project I looked into academic data on a statewide basis, and looked specifically at five Career Technical schools and compared their information. To supplement this research, I also spoke with a point of contact from the Career Technical high school that I attended, which was included in the study. Once understanding the assumed differences in the programs, this project then highlighted which programs can be considered successful, and how other schools could learn from these examples.

Research for this project includes traditional methods such as collecting data, personal interviews, and general data analysis. A combination of quantitative and qualitative measures is used to obtain statistics as well as opinions and personal accounts. Quantitative research is used to obtain data regarding high school standardized test scores and acceptance into colleges and universities to draw a comparison between the five different schools in Massachusetts. Additional qualitative methods aid in the research, such as interviews with individuals from a Career Technical school regarding the programs and the transition of students from high school to post-secondary education.

I have gathered a series of both qualitative and quantitative data from high schools in Massachusetts. This study focuses on five Career Technical Educational institutions in Massachusetts, as well as their sending towns. Through speaking with guidance counselors at one of the Career Technical high schools, I am able to look further into their students' transitions from their respective high schools into the post-secondary educational world.

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Through these interviews I have gained insight into graduation rates, percentages of students continuing onto specific types of further education, and learn more about the students specifically and their backgrounds and learning environments.

This information is drawn parallel to the quantitative information gathered. In addition to these interviews I gathered statistical information on these schools, such as SAT scores, Massachusetts Comprehensive Assessment System (MCAS) scores, demographics, and other standardized information. Through the Massachusetts Department of Education, I obtained this information for all of the districts I am looking into, including their Career Technical schools as well as public and private institutions. With this data I searched for any significant differences and understand in what areas the schools may be lacking or exceeding others.

Through analyzing the above information, I noted any discrepancies in the amount of students moving into further education such as formalized four-year college programs to further understand why these differences may exist. This aided me in identifying the factors of success in a Career Technical high school. Through examining test scores, demographics, and the student bodies in general I became closer to uncovering why in general Career Technical students may be greatly underrepresented in today's post-secondary education, and why some schools are beginning to be more represented in those institutions.

As with any research topic, there were some obstacles to overcome and theoretical issues faced. It was possible that the data collected would not display the expected results, in which case I would further analyze the data for other existing trends to further understand the programs and methods used by the schools. Additionally, throughout this project I had to



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continue to remember that not all students move into the world of post-secondary education and may take another track such as entering the work force or the military. These differences could affect comparisons across the schools regarding the measure of students continuing into post-secondary education.

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## **LITERATURE REVIEW**

### Introduction

With the rapid growth and changes in the global workforce, Career Technical Education is more important than ever. With an ever growing presence of technology in every industry there is an increased need for highly skilled individuals with a background in these technical fields. As college has always been viewed as an important step for “successful” young adults and more and more entry level positions are requiring a college level education, it is important to ensure that individuals’ opportunities to attend college/university are not hindered by their decisions to begin technical training earlier in their educational careers.

Much of the following research highlights stereotypes and stigmas surrounding vocational students and how they are being challenged in recent years. In order to be successful in moving students into post-secondary education, the Career Technical schools must first structure their programs and courses to overcome these issues. This literature is understood through a sociological lens to evaluate said stigmas and how they affect students and all others involved.

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## Background

American education exists in many facets in today's society and continuously evolves. These developments have led to many different branches of education, including what we know today to be Career Technical Education.

Beginning in small school houses and homes, education in America was not always very established or regulated. Education moved through reform after reform until reformers met their goals; "universal, free public education" as a reality (Education in the United States, 2016). This began with the turn of the 20th century and developments have continued, forming the institutions we are familiar with today.

The turn of the century also brought with it the establishment of vocational programs within education. The Smith-Hughes Act of 1917 was the first piece of legislation that pushed the creation of vocational programs in high school in America (Education in the United States, 2016). As many educational advancements have, the wide spread practice of vocational education began in Massachusetts with the opening of the first vocational program, the Smith Vocational and Agricultural high school in Northampton, in 1908 (Fraser, 2008).

Up until the end of the 20<sup>th</sup> century, vocational education was still perceived as the last resort for students who were not academically driven, and who are likely not to attend college following graduation (Dougherty & Thomas, 2016). These types of institutions held a negative reputation, and students from these schools were not recognized as intelligent or hard working academically. A program which started as apprenticeships and other means for

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young men to learn a trade has since grown into a drastically different type of program, but it wasn't until recently that this stigma began to shift positively into academia.

As Alison Fraser discusses in her 2013 publication, "today's career vocational technical schools are well rounded academic centers that combine rigorous conceptual class work with practical application". This jump into a more respected institution has taken place over the course of the last twenty years, and can be mirrored by the change in terminology used to describe these schools. Programs which were known for decades as Technical Vocational Education are beginning to be recognized as Career Technical Education, or CTE. Vocational schools have shifted from the path for those who are not destined for college to current Career Technical Education for students who value education and a skill. These students are able to get a jump start in many industry skills such as various medical, drafting, and other technology driven fields.

Fraser has focused many of her works in this realm of the "new" CTE and vocational education models, including her works "Hands-on Achievement: Why Massachusetts Vocational Technical Schools Have Low Dropout Rates" (2013) and "Vocational-Technical Education in Massachusetts" (2008). These studies look into the continuous advancements in the CTE world, and how the programs are progressing and becoming more academically driven by comparing figures such as test scores and graduation/dropout rates between Career Technical schools and traditional public high schools. They address the negative stigma that can still be found surrounding these institutions and highlight the changes that have been fostered.

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## Review

Through my research I have explored many aspects of literature involved in the conversation of Career Technical Education and movement into post-secondary education. As the first step of this process involves current data collection and analysis, most of this literature has fallen into four categories that affect the latter portion of the project during which I decipher the differences in the programs and unpack the stigma held around vocational schools. This relevant literature included the shift of Career Technical Education in past years, the past/current stigma held, college admissions practices, and Massachusetts as an overall leader in education. In addition to these sections, research was also focused on sociological theories which can be applied to educational institutions.

## Shift in Vocational Education

As discussed in the background of this paper, education as an institution has grown and shifted in many ways throughout the years since becoming a formalized institution. As education has branched into sectors such as charter schools and vocational schools, these subsets have also continued through their own growth and shifts.

Career Technical Education has gone through drastic transformation in the last few decades, integrating a stress on academic education in tandem with the technical training. These schools are becoming prominent educational forces and driving today's society and work force. Students attending these institutions are now able to obtain the same level of academic education as they would at their sending public high school, in addition to being prepared

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with ample resources to move forward into a profession or post-secondary education with ease (Fraser, 2008).

As Fraser explains, “the academic improvement of career and technical education in Massachusetts has contributed to its increasing popularity with students and their parents” (2008). This is seen through state test scores, SAT scores, and class offerings such as AP courses and additional trades.

This growth in education is clearly outlined through recent research projects. Country wide we are seeing Career Technical students excel in their studies and results such as “86% of seniors in vocational high schools passed the MCAS exam, compared with only 41% a year ago” (Lewis, 2003), “vocational schools have better attendance rates and lower dropout rates than traditional high schools” (Ardon & Fraser, 2015), and at one school “more than 200 [out of approximately 550 eligible] students enrolled in AP courses each year” and “graduation rates approaching 100 percent” (Baverl & Achieve, 2015). These types of statistics, which are also illustrated in Appendices A-D, are drastic and impressive when compared not only to the historical figures of vocational education, but education as a whole. In these figures the state average is compared to four Career Technical schools in different MCAS tests, and it is easy to see that in most cases the technical high schools greatly surpass the state average.

This growth should serve as a basis for a growing reputation among Career Technical Education, but that growth is not necessarily being seen on a social level both among post-secondary education institutions and the general public.

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In addition to their academic advancements, these institutions are making leaps and bounds through their Career Technical programming. Fraser (2008) reveals the variety of new skills that Career Technical Education is adopting in order to train and educate students in some of the most up and coming fields. These new fields include “robotics, biotechnology, engineering technology and electronics”. Many of these new skills not only jump start technical training for students, but prepare them for tracks which often lead to post-secondary training and continued education. Career Technical institutions are fostering students who would greatly benefit from further education, so it is important to understand how these students are viewed in the academic world, and how to break the stigma and move more of these students into post-secondary education.

Developing from these new skillsets, students are also obtaining hands on education prior to finishing their secondary education. Many of these areas involve hands on skills in which students can greatly benefit from real life training, and where hands on training is abundant in post-secondary education. A study from the Southern Regional Education Board (2001) highlights the idea that students from these schools have a wide variety of experience including internship and real life practical work prior to finishing their high school careers. The Boston Globe article “Plumbing then Political Science” (2007) provides an example of a student who, due to her vocational education, was able to far exceed the expectations set for her in her undergraduate science program and quickly became a pioneer in her science field due to prior lab experience. As many colleges and university require internships or practical, hands on experience to be completed during an undergrad program, these real life skills gained through vocation education put these students one step ahead and better prepare them

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for that aspect of post-secondary education. Through requirements in high school and outside vocational training programs such as VICA/SkillsUSA (Schreiber, 1995), students of these programs are able to enhance their skills and prepare themselves for further education in their respective field.

### Stigma & Viewing Career Technical Students in Academia

Despite these immense measures of growth within the vocational/Career Technical Education realm, the stigma surrounding these types of institutions has not altered in the same magnitude. Dougherty & Thomas (2016) mention the stereotype that vocational education was typically where students ended up when it was assumed they would not be able to succeed in college. These institutions were thought of as the path for those at the lowest level of achievement academically, and the students were not even considered for post-secondary education.

Throughout the past few decades, however, the number of students continuing on to post-secondary education has sky rocketed. Due to the various academic improvements and the schools integrating more in-depth programs, schools are showing figures of over 60% of students moving into post-secondary education (Fraser & Donovan, 2013; Darling, 2007). The introduction of some of the new trades in science, technology, engineering, and math (STEM) programs have really increased this, as well as general inclusion of more rigorous academic programs to remain competitive with traditional high schools.



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Colleges and universities are starting to recognize the significant difference in current Career Technical schools. In an article from the Boston Globe, “Plumbing then Political Science” (2007), it is recognized that even major institutions such as MIT are beginning to break the stigma and are welcoming more and more graduates of high school Career Technical programs.

Not all schools are embracing this shift in the educational field, though. Fraser highlights that the “socio-cultural context of vocational education can never be ignored. Because of the perceived blue-collar nature of what the students are studying...” (Fraser, 2008). Many colleges and universities country wide are still standing behind this idea, continuing to see higher potential in students from come from traditional educational backgrounds. It is often over looked that vocational students have a very high likelihood of becoming leaders and pioneers within their fields of study and active citizens within their communities, which is the proposed basis of admittance into universities according to Sternberg, Bonney, Gabora & Merrifield (2012).

Although there have been many advancements within the realm of Career Technical Education, it is important to note in this study that not all trades and skills learned at these schools are transferable into post-secondary education, and not all students will pursue a college degree immediately after high school. It is common for students who work in traditional trades such as plumbing or HVAC to enter the work world, where as other trade such as carpentry or IT may lead students to two year technical programs instead of a traditional bachelor’s degree. These students pursuing other options could skew data within

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this study, but it is important to note which trades are most commonly a stepping stone into post-secondary education as reviewing any data collected. There are many growing skillsets such as drafting and business from which students can make fluid transitions from high school into post-secondary education.

#### Massachusetts as a Leader in Education

Conducting this project within the state of Massachusetts makes perfect sense, as Massachusetts is and has been a leader in education since the nineteenth century. This excellence does not stop when considering vocational education. Fraser (2008) notes the 63 Vocational-technical education (VTE) programs throughout the state, further explained as 26 regional schools and many programs existing as subsets to traditional schools by A. Ciccolo (2008). Career Technical programs have been growing in Massachusetts, and are an ideal landscape to conduct my study.

When compared to other states, Massachusetts excels in most all aspects of education. In 2015, for example, Massachusetts had the highest Average Adjusted SAT score across the nation with an average score of 1694 (Zhang, 2016). The SAT is one of the only nationally utilized testing strategies, and Massachusetts out performs schools from all other states and areas.

Ciccolo continues to define Massachusetts as a continuing leader within Career Technical Education, noting specifically that certain Career Technical high schools are even surpassing traditional public schools in state-wide standardized testing scores. As previously mentioned

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and exemplified in Appendices A-C , these increasingly improving scores stand as an example of the increasing academic abilities of these students in tandem with their acquired skill sets.

Academically, Massachusetts requires all of its public Career Technical programs to adhere to all state academic requirements, including completing the MassCore. Fraser (2008) notes that through the reworking of these programs, Massachusetts has become a strong force in the academic sector of Career Technical Education. The academic teachers, which are all “licensed by the MA department of elementary and secondary education”, are preparing their students for further education through the inclusion of AP courses and lesson plans that cover all aspects of the MassCore. This is specifically impressive to consider within these schools, as they have a severe lacking of representation within the state’s Common Core State Standards (CCSS) implementation teams nationwide (Meeder & Suddreth, 2012). Such under representation signifies the still existing lack of awareness of vocational institutions within some regions.

Ardon & Fraser (2015) highlight this point of excellence in performance in their most recently article about career-technical education in Massachusetts, noting that “it is clear from assessment, graduation and follow-up data that career-vocational technical education CVTE as it is practiced in Massachusetts is a success”. This success, growth, and wide variety of institutions in Massachusetts makes it the perfect subject area for this study. This research furthered my guiding question; what makes many of these schools so successful?

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### College Acceptance Practices

Also important to analyze are the practices colleges and universities follow in their admissions processes. This can help to understand what factors constitute “success” in fostering post-secondary education bound students. While typically admissions are based on GPA and standardized testing (Sternberg et al., 2012), the decisions are not all objective. Items such as a student’s essay or an interview with the admissions office add much more subjectivity into the selection process.

Stemler (2012) dives into some of the difficulties of college admissions, and how they can negatively affect capable students. Noting colleges and universities “as a platform for innovation and the discovery of new technologies that advance society”, it would seem that colleges and universities would be seeking students graduating from these up and coming Career Technical schools. But, it seems that Career Technical students may not be being viewed in such a manner upon their college applications, and the students’ high schools may be affecting their ability to attend a school.

Various proposed technological tools to aid with acceptance process are described by George, Soares & Gilbert (2009), but the authors still find issues such as the potential for process to be inconsistent among institutions, and for applicants to not all be measured equally. Along these same points, Stemler (2012) argues that this narrow mindedness that he believes exists among college acceptance processes must be addressed by admissions officers and counselors, who can implement testing and procedures that measures more abilities within students outside of standardized testing. This could highlight skills such as leadership and adaptability that

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students may be building at Career Technical schools; skills which are very important as a student makes the transition into post-secondary education and later into the work world.

#### Sociological Theories

Sociologists view education as an institution, in which society and culture are passed through to students, and also mirrored in the society of the school. There are many different ways to interpret this large institution, including the ideals behind Conflict Theory and Structural Functionalism.

Conflict Theory is a widely understood ideal, in which it is believed that “differences in school experiences range... [but] are not distributed randomly” (Korgen, 2019). This means that there are bound to be differences in the teachers, facilities, and resources among different schools, but the condition of the school and learning environment will directly affect the student. Conflict theorists are likely to find that students who are of a lower class will attend a poorer funded school, receive a poorer education, and continue through this economic cycle. Through this concept, education will reinforce the position which the students are born into.

Among those who disagree with Conflict Theory are Structural Functionalists. Functionalists view education as a way to begin to balance inequality, rather than perpetuate it. To functionalist, “education promotes social cohesion and stability” (Korgen, 2019). “Those with the highest abilities receive the most advanced training”, and functionalists do not believe that abilities derive directly from social class positioning. The idea of this “system” is

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that talent and hard work will be recognized, and those individuals will improve their personal standing through their furthered education.

These theories bring forward differing ways to view the current education system, and provide two varying ways to consider success within an educational institution and what drives it. As Fry mentions in Krogen's text, "a sociological perspective can help us understand and shape the educational institution to more fully reflect the meritocratic values it serves". A successful Career Technical Institution will follow the ideals of Structural Functionalism, drawing on their hard working students and guiding them towards success and future opportunities, including post-secondary education.

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## Conclusions

The published literature in these fields highlights the increase in academic success in Vocational/CTE schools, which leads to the assumption that these students should have increasing rates of success, even when compared to students from traditional public high schools. The statistics showing comparable test scores and over all academic success point to a continued stigma from decades past.

Bringing this literature into my study will be very helpful as I move into the second portion of the study and begin to how these Career Technical high schools can succeed in producing college bound students. Being able to understand the growth pattern of Career Technical Education and education as an entire institution will be beneficial to tracing the advancements made by some institutions, and if they are a factor of success.

Working through this history and my own findings, I found some of the keys to success for these schools, which can break the barrier for Career Technical students. Students from these Career Technical institutions are becoming more prepared for their future paths, but there is minimal literature regarding their success. This brought me back to my research question, wondering what these schools must do to achieve success in secondary education. What are the characteristics of successful Career Technical High Schools in Massachusetts, specifically regarding preparing students for post-secondary education? While Massachusetts is highly regarded in education and Career Technical training, I hope to open doors to other departments of education and promote the growth of other CTE programs nationwide.

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Through this I hope to open more opportunities for students who, until this point, were not able to reap the benefits of Career Technical Education.



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## **METHODOLOGY & DATA COLLECTION**

Methodology for this research included both quantitative and qualitative aspects to fully understand the schools, their programs, and their positioning compared to other programs and schools. All of these aspects looked into five Career Technical schools in Massachusetts as well as their sending towns, or the towns they accept students from. Through selecting these regions, I was able to not only analyze and compare different Career Technical schools, but also compare the students attending to other students in those regions. Having these different types of comparisons become very important when looking into average incomes.

The different schools chosen were Blackstone Valley Regional Vocational Technical High School, Greater Lowell Technical High School, Nashoba Valley Technical High School, Tri-County Regional Vocational Technical High School, and Upper Cape Cod Regional Technical School. While most of these schools are located in the eastern part of Massachusetts, they all span different economic areas and different areas of the state. Each school has between four and thirteen sending towns in its region. Additionally, as seen in Appendix E, the schools span between about 700-3,500 students in the 2014-2015 academic year and 13-23 vocational programs currently.

Once the schools and regions were determined, I then utilized databases provided by the Department of Education in Massachusetts to gain further information about the schools and their student bodies during the 2014-2015 academic year. I chose to examine factors such as average MCAS and SAT scores, continuation of students into various types of post-secondary

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education, and other demographics of the schools. This included average class size and percentage of students who were considered economically disadvantaged at each school.

Additionally, I spoke with Rebecca Swasey, the Academic Curriculum Coordinator at Blackstone Valley Tech in Upton, MA to gain further insight on the daily programming of the school. This interview was used to further understand the set-up of the school, both academically and technically. This specific school was chosen following examining some of the data. Blackstone Valley Tech proved to be an outlier in many aspects, and a model school to find factors of success in Career Technical Education.

The research was rounded out with some financial information, where the average income per capita was obtained and analyzed for each town within these regions. State-wide data provided by the UMass Donahue Institute (UMass Donahue Institute, 2015) was gathered and compared to the students in each region considered economically advantaged. This was most useful in comparing the regions its respective Career Technical High School.

The data gathered from these sources was used to draw comparisons between regions and Career Technical schools. The information for each Career Technical school was also compared to its respective region, to further understand how the schools perform comparatively.

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## **FINDINGS**

When analyzing the data, I feel looked at the continuation into post-secondary education following high school for all districts involved. This data was first looked at for all of the five Career Technical schools, as seen in Appendix F. Blackstone Valley tech showed a much higher rate of continuation with 79% of their students moving into some type of post-secondary education immediately after graduation in 2015. This comparison focused most on the continuation into both private and public four year programs, as this is the most sought after route of students graduating from traditional public or private high schools. Of these 79% of students that moved into post-secondary education, 85% of those students were enrolled in a private or public four-year program.

When these schools are compared to their region, the results are showing of the lack of success these schools are facing when moving students into post-secondary education. As shown in Appendix G, Nashoba Valley, Upper Cape Cod, Greater Lowell, and Tri-County all have the lowest percentages of their graduates for the 2014-2015 school year attending some sort of college or university (“2014-15 Plans of High School Graduates Report”). On the other hand, Blackstone Valley Tech has more students moving into post-secondary education than about half of the schools in its region. When focusing on continuation into post-secondary education, this data highlighted Blackstone Valley Tech as a positive outlier, and a success story in moving their students into this type of education.

Understanding Blackstone Valley Tech to be an outlier when it comes to continuation into post-secondary education, I then looked into some factors which affect that including

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standardized testing scores. Starting with MCAS score, or Massachusetts Comprehensive Assessment System, I conducted my research in the same manner as above. The Career Technical schools were compared, and then further compared to each school in their region. When looking across the five Career Technical high schools, Blackstone Valley Tech again stood out due to their high performance. This school saw over 60% of their student placing advanced in ELA, 65% placing advanced in Math, and over 40% placing advanced in Science. Comparative results can be seen in Appendix H, where I found that Blackstone Valley Tech had at least 10% more students placing advanced in each section of the MCAS exam than the other schools included.

On a region by region basis, the Career Technical schools do not fall far from their sending schools, but are not excelling comparatively. When continuing to look at advanced placement, I found in Appendices I-L that Nashoba Valley, Upper Cape Cod, Greater Lowell, and Tri-County all fell below some of the other schools in their region. This is another area in which we see academic achievement and success though Blackstone Valley Tech. Appendix M shows the MCAS scores of Blackstone Valley Tech and the schools within its region in 2015. Blackstone Valley tech had over 30% more students placing advanced in ELA, 25% more in Math, and nearly 20% more students in Science. Students who place in the top 25% of their region in the MCAS exams are granted the John and Abigail Adams Scholarship, which is a “tuition waiver for up to eight semesters of undergraduate education at a Massachusetts state college or university” (Massachusetts Comprehensive Assessment System, 2016). High placement on this exam could be a determining factors for a student

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moving into post-secondary education, and I did find a direct correlation between higher scores on this test at Blackstone Valley Tech and higher rates of continuation.

In able to maintain a scope that spanned across education as a whole, I also examined the SAT scores for these schools. While the MCAS is a standardized test used only in Massachusetts, the SAT scores give an idea of how these students are performing on a nationally distributed exam which is considered by post-secondary education nationally. Reflective of other research measures, Blackstone Valley Tech again showed to be a positive outlier with their high average score on the SAT exam in 2015 (Appendix N). On average students from this school outperformed students from the other four Career Technical schools in all areas of the SAT; Reading, Writing, and Math.

On a regional basis, the SAT exam appeared to be an opportunity for advancement in all of the Career Technical Schools. Nashoba Valley, Upper Cape Cod, Greater Lowell, and Tri-County all showed to have the lowest scores in their region for all three sections of the exam in 2015, as shown in Appendices O-R. The differences between the Career Technical School in the regions and the top performing school is in some cases upwards of 100 points per section, such as with Tri-County. While Blackstone Valley Tech did not produce the lowest scores within their region (Appendix S), the numbers still show room for continued improvement in their preparations. Through the literature review it was noted that although post-secondary institutions are beginning to explore other routes of acceptance, standardized test scores such as the SAT are still very important. The data showed a lack of preparation for this important exam on a student wide basis.

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In addition to these test scores, the Massachusetts Department of Education also provided other general information about the schools including class size and ratio female to male students (Class Size by Gender and Selected Population Data Report, 2015). Through this information shown in Appendix T I found that Blackstone Valley Tech has the largest average class size of the five Career Technical High Schools, and the largest percentage of female students. These areas would be very important to look into for future research, but were not examined further within the scope of this research.

Through these statistics and data points, I was beginning to see that Blackstone Valley Tech was excelling in areas that colleges look at during their acceptance processes, and areas that would push students to think about pursuing post-secondary education as an option. With these trends, I was able to conclude that Blackstone Valley Tech was therefore performing successfully in terms of sending students into post-secondary education, and a model for my research question. Needing to further understand their program and background in order to highlight the factors of a successful Career Technical High School I spoke with the Academic Curriculum Coordinator, Rebecca Swasey, to learn more about the school and try to uncover their success factors (Swasey, R., 2018).

During her time involved in Career Technical schools, Swasey mentioned she has found there to be a negative stigma surrounding the schools, but finds that it is starting to get better overall. I was able to speak with Rebecca Swasey about the history of Blackstone Valley Tech and their current programs and practices.

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Beginning with the history of academic focus and success in the schools, Swasey discussed the introduction of the MCAS exams in the state of Massachusetts about 25 years ago. The school and schools of its kind did not hold a strong focus on their academic programs, as they were almost strictly for training in “blue collar” work. When this exam was introduced the Vocational schools of the time were unhappy and not willing to be held to the same academic standard. Swasey expressed that the move to embrace the MCAS exam and build a strong academic foundation came from Dr. Fitzpatrick, the superintendent of Blackstone Valley Tech. She conveyed that the school’s focus on academic success began there, and hasn’t stopped since.

When asked about their high performance on MCAS exams currently, Swasey stated that they have since continued to hold a high focus on the MCAS and preparing their students academically. The school holds MCAS boot camps, mock exams, and is continually preparing their students school wide for the exams which are required to graduate.

The conversation then shifted to their SAT performance, which was found not to be poor, but definitely showed room for improvement. Swasey discussed how they are now adding focus into the proper preparation for the SAT exams, especially as more of their students are becoming college bound. They know they are able to well prepare their students for MCAS exams and are continuing to use those programs, but are now creating more for SATs. These items include SAT prep course, activator questions in academic classes that span the reading and math sections of the SAT exam, integration of questions into academic courses and even shops, and pushing the availability of resources to their students.

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Through all of their changes, a common factor Swasey mentioned was integration. Through the programs put into place at Blackstone Valley Tech, students understanding that their academics are equally as important as their technical training, and it all overlaps. In preparation for major exams such as the MCAS or SATs, students may have to practice math problems in their trade, or work on their writing skills for a business plan.

Other topics discussed with Rebecca Swasey included how students are viewed when moving into the world of post-secondary education. She noted that in her experience, colleges and universities are starting to look more at the transcripts and see the students from Blackstone Valley Tech as qualified. The courses taken at this school are equivalent to courses taken at other public high schools, therefore when a non-biased look is taken at the transcripts, the students are able to integrate into post-secondary education. Swasey did mention, though, that there is a criticism when students move into post-secondary education, especially if it is not to further training in the field that they went through during their time in a Career Technical Institution. Students and Faculty of Career Technical schools view this as an additional skill set that the student has to their advantage, meanwhile many public eyes view this as a lost opportunity for another individual.

Understanding more about Blackstone Valley Tech's programs which feed their academic success, I looked finally at the income of the regions and the percentages of students being considered as "economically disadvantaged". Understanding that the funding going into a school can affect its programs and facility, this piece was important to add to the research.



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Research about average income began with the average estimated per capita income per town in 2015 (UMass Donahue Institute, 2015). By grouping these towns into the regions the schools fall into, I was then able to calculate the average per capita income per region, as shown below in Appendix U. As explained through my research in literature, Conflict Theory assumes that the schools with the most funding and economic backing should be the highest performing schools, but that is not the case displayed here. All of the data points had pointed to Blackstone Valley Tech being the highest performing school academically, yet the data shows the second lowest average estimated per capita income of the five regions. This did not show to support the ideals of Conflict Theory, but rather highlights the principles behind Structural Functionalism and one's ability to work towards success.

While these levels of average income affect the amount of funding that schools receive, students do not attend the Career Technical schools equally from each town. The student body is not a representation of the towns the school accepts students from, so it was important to look into the percentages of students that are considered to be economically disadvantaged within the school (Class Size by Gender and Selected Population Data Report, 2015).

Contrary to the region it resides in, Blackstone Valley Tech had the smallest number of economically disadvantaged students, with 9% of their students falling into that category (Appendix V). This finding was more in line with the ideals of Conflict Theory, as the statistics allude to Blackstone Valley Tech having students with a higher amount of resources individually, and therefore would correlate with their higher academic performance in the above mentioned areas.

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When considering income there was a discrepancy between the income of the region and the students that actually attend the institution. In the case of Blackstone Valley Tech, the students may individually have more resources available to them, but it is possible that the school itself would not get as much funding as others might due to the region it is located in and the average income in the area. Therefore, the program development for the academic and technical training is developed on a smaller budget than may be assumed with the lack of economically disadvantaged students that do attend the school.

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## **DISCUSSION**

Through these findings, it became evident that Blackstone Valley Tech is an outlier in Career Technical Education in Massachusetts. Both high test scores and the high continuation into post-secondary institutions show Blackstone Valley Tech as successful in both preparing students for and then sending students into post-secondary education. Highlighting this school as successful and speaking with Rebecca Swasey allowed me to recognize the success factors of a Career Technical High School with regard to preparing students for post-secondary education. Blackstone Valley Tech shows strong integration, advising methods, and personal development.

Within all of the programs offered by Blackstone Valley Tech is the idea of integration. Integration falls into programs such as their MCAS and SAT preparations. Providing questions to be completed every morning and integrating the students' trades into the example questions, the school is able to create a connection between the importance of academic learning and the students' trades. The school creates a cross over between the academic training and the technical training, and uses this relationship to further benefit the students' preparations. General academic practices are carried into technical training through "Related" courses, in which students may work on their writing or math skills through assignments related to their specific trades.

Blackstone Valley Tech focuses on working closely with their students, and their success can be attributed to their advising methods practiced. The school offers many opportunities for direction aside from one on one visits with the guidance counselors. Many students create

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lasting relationships with their shop and academic teachers who also work to provide opportunities to the students. Shop teachers work with their students to source Co-op jobs, during which a student may continue their trade out in the field instead of in the classroom, while still attending their academic classes every other week.

Additionally, this advising is continued within the Career Enrichment class all students take throughout their four years. In this class students work with applications to look into colleges and potential future tracks such as Naviance, Common App, and formulating their college essays. These classes focus on a much wider base of material though, and push students to work on their entrepreneurial and business skills as not all students are college bound.

Overall there is a general understanding that not all students are bound to move into post-secondary education, but the strong focus that is put on academics and preparation is still so high. We saw this emulated above with their high MCAS results.

Finally, all of these programs allow for Blackstone Valley Tech to facilitate a sort of personal development within their students. Through their shops students are able to begin to work in a business environment, and even work with outside businesses on a professional level. Once these skill shave been acquired students become eligible to obtain Co-op jobs, in which they would work 30-40 hours per week during shop weeks. These students still maintain a full course load and complete homework during those work weeks and learn to prioritize their responsibilities. In this type of environment skills such as multi-tasking and general maturity are learned more completely earlier on in life than other students may experience.

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## **CONCLUSIONS**

“Today, much more complex, competitive, information age American industries demand a more highly educated workforce” (Dyrli, 2008), and Career Technical High Schools must keep up with the demand. This push for further educated individuals calls for an increase in these students continuing their training through post-secondary education. The success of the schools in the current age is dependent on their ability to adapt to the changes and prepare many of their students for the world of post-secondary education.

Blackstone Valley Tech has been excelling in integrating academic preparation into their daily programs, advising their students on the many opportunities ahead of them, and developing mature individuals who are ready to take on the challenge of furthering their education. Their success of these factors has shown through their large amounts of students making the jump from their Career Technical training into a private or public four-year institution.

In order to create a full picture, there were some areas of research which could have been explored further had time permitted throughout this study. Looking further into the income of a region compared to the actual funding provided to the schools would have allowed me to better understand the resources provided to the schools, and therefore what the schools are feasibly able to provide to their students. Additionally, factors such as gender ratios and class sizes can also affect learning environments and learning outcomes, and would have been interesting variables to consider. In future research opportunities these variables could be used to help to further this information and gauge success of different schools.

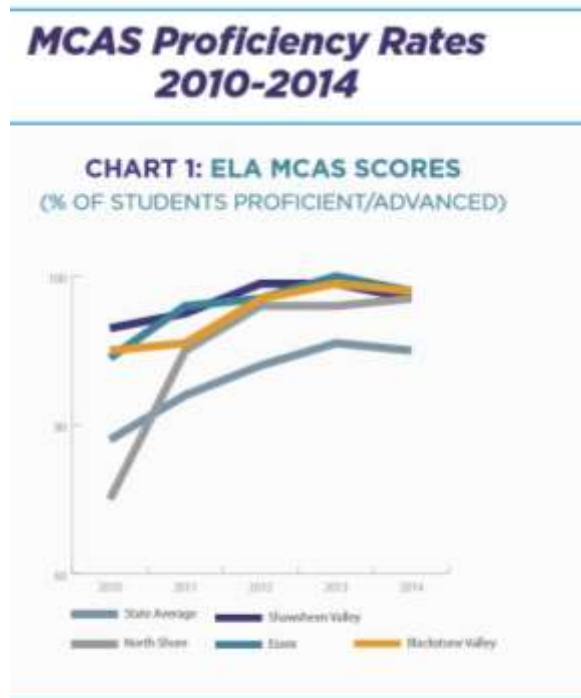
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## APPENDICES

### Appendix A – MCAS Scores ELA 2010-2014

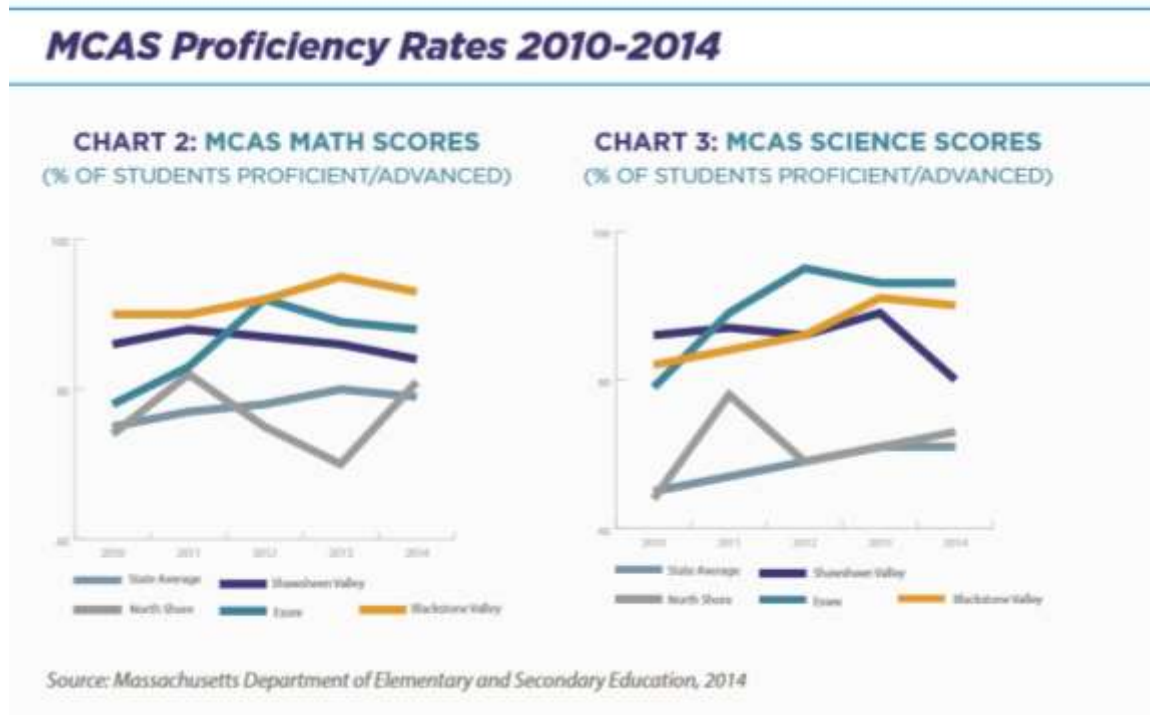


Source: Massachusetts Department of Elementary and Secondary Education, 2014

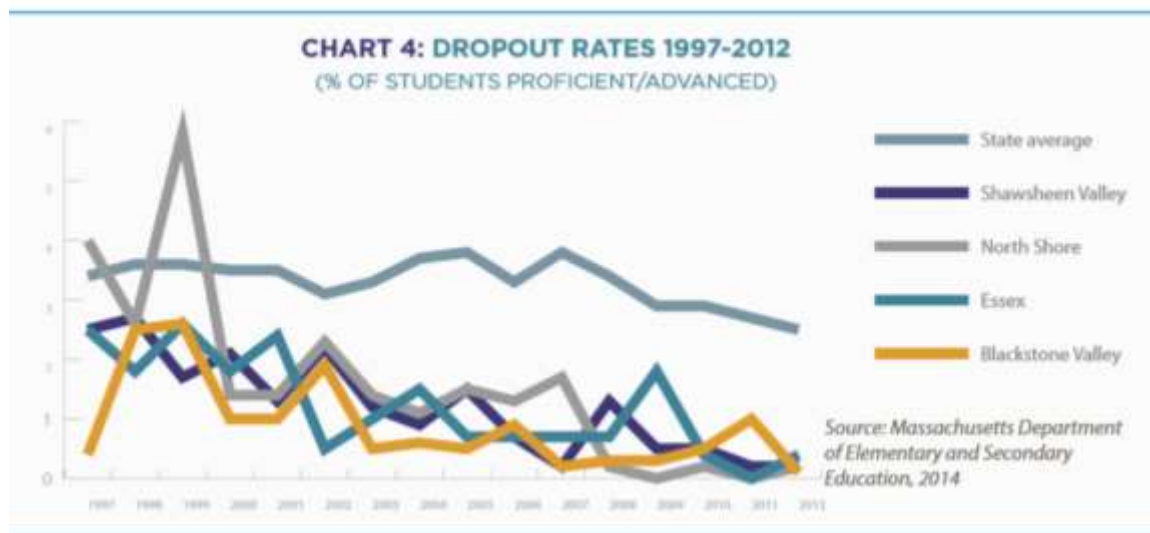
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## Appendix B- MCAS Scores Math & Science 2010-2014



## Appendix C – Dropout Rates 1997-2012

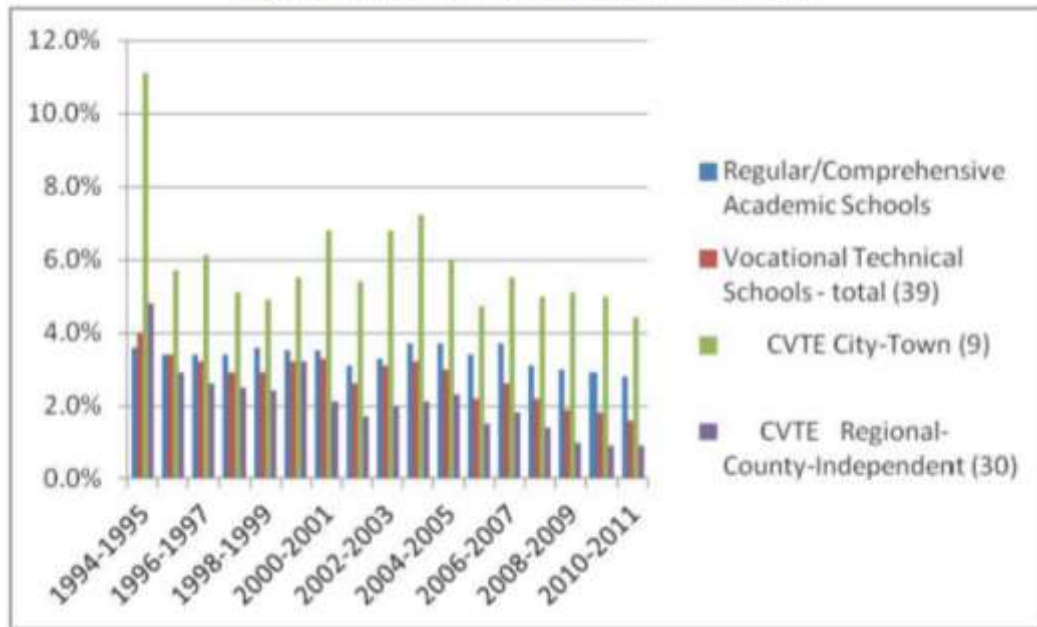


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## Appendix D – Annual Dropout Rates

Figure 1: Annual Dropout Rates by School Type



Source: Massachusetts Department of Elementary & Secondary Education

## Appendix E – CTE Information

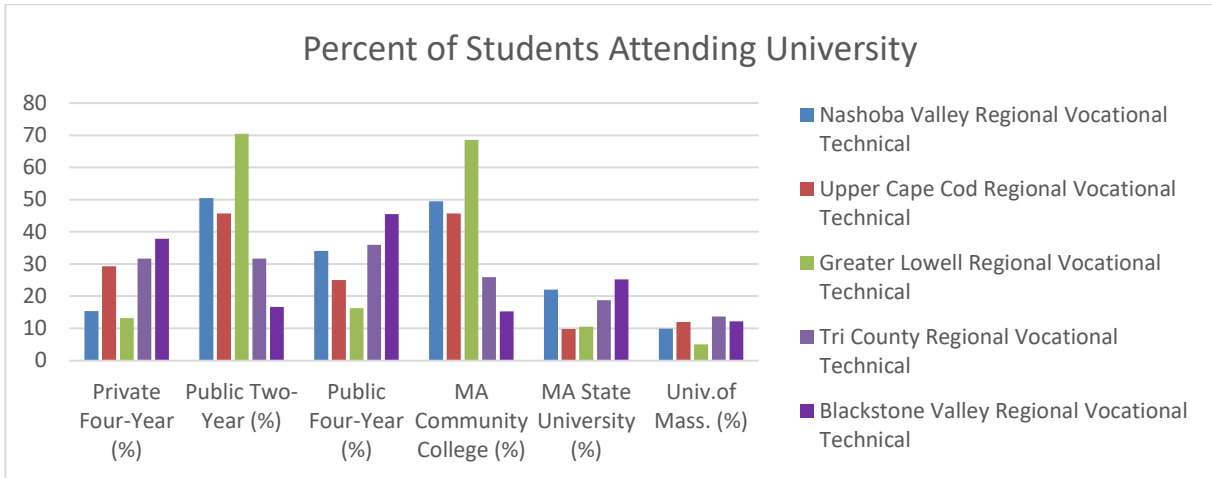
District Name	Number of Students	Vocational Programs
Nashoba Valley Regional Vocational Technical	3,475	22
Upper Cape Cod Regional Vocational Technical	699	13
Greater Lowell Regional Vocational Technical	2,129	23
Tri County Regional Vocational Technical	1,017	16
Blackstone Valley Regional Vocational Technical	1,185	18



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## Appendix F – Percent of Students Attending University



## Appendix G – Percent of Students Attending College/University

District Name	Attending Coll./Univ. (%)
<b>Nashoba Valley Regional Vocational Technical</b>	<b>56.2</b>
Ayer Shirley School District	67.2
Chelmsford	89.4
Littleton	87.3
North Middlesex	83.3
Westford	91

District Name	Attending Coll./Univ. (%)
<b>Upper Cape Cod Regional Vocational Technical</b>	<b>62.2</b>
Bourne	67.5
Falmouth	75.6
Marion	
Sandwich	84.1
Wareham	63

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District Name	Attending Coll./Univ. (%)
<b>Greater Lowell Regional Vocational Technical</b>	<b>52.4</b>
Dracut	84.3
Groton-Dunstable	89.9
Lowell	76.9
Tyngsborough	82.5

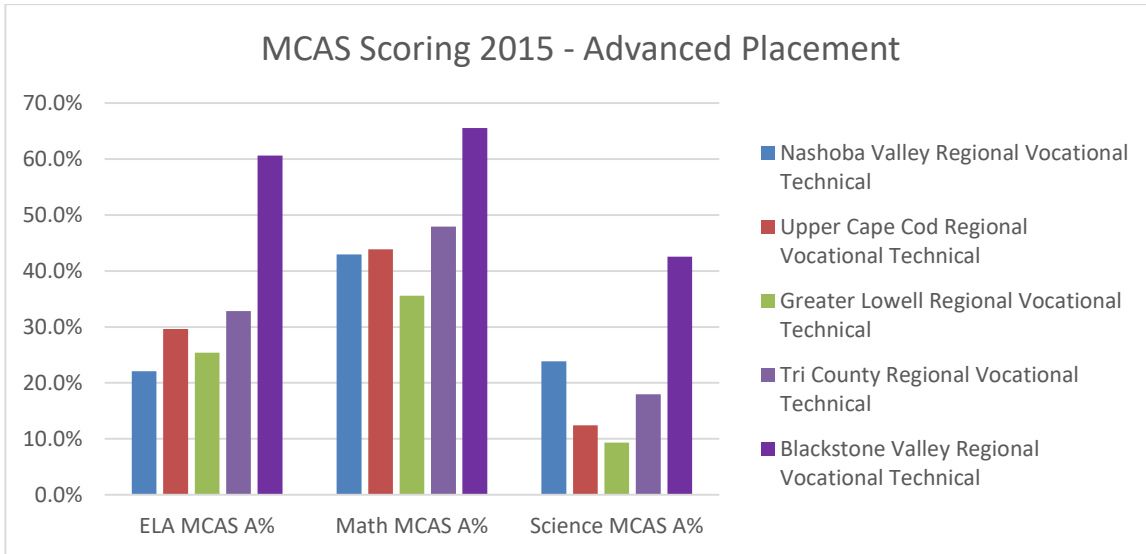
District Name	Attending Coll./Univ. (%)
<b>Tri County Regional Vocational Technical</b>	<b>58.4</b>
Dover-Sherborn	90.7
Franklin	89.5
King Philip	86.1
Medfield	94
Medway	87.8
Millis	87.4
North Attleborough	87.5
Seekonk	85.5
Walpole	87.8

District Name	Attending Coll./Univ. (%)
<b>Blackstone Valley Regional Vocational Technical</b>	<b>79.3</b>
Bellingham	67.4
Blackstone-Millville	62.6
Douglas	79.2
Grafton	81.3
Hopedale	84.9
Mendon-Upton	83.1
Milford	77
Millbury	74.8
Northbridge	57.6
Sutton	86.8
Uxbridge	72.9

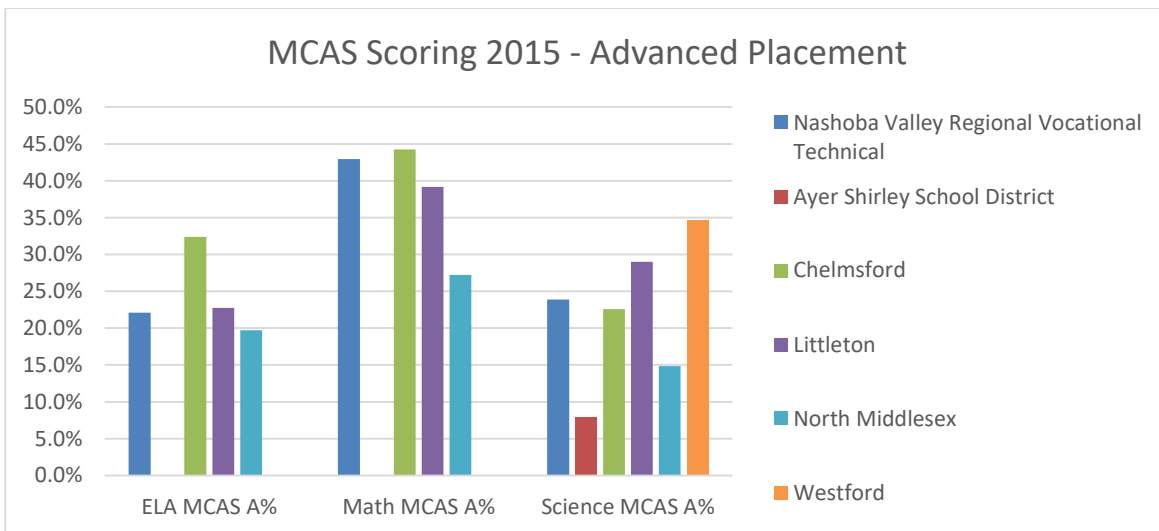
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## Appendix H - Advanced Placement in MCAS 2015 in Career Technical Schools



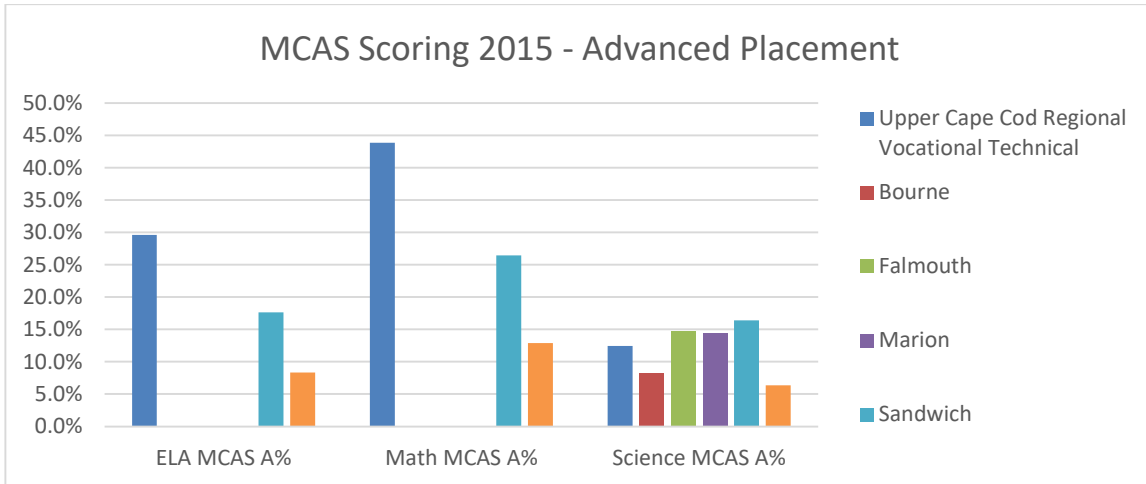
## Appendix I - Advanced Placement in MCAS 2015 in Nashoba Valley Region



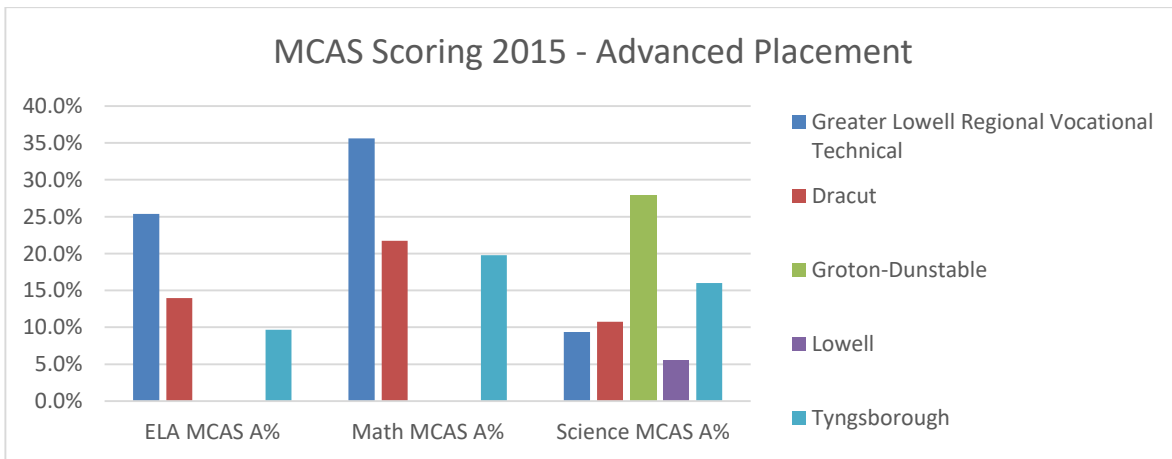
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## Appendix J - Advanced Placement in MCAS 2015 in Upper Cape Cod Region



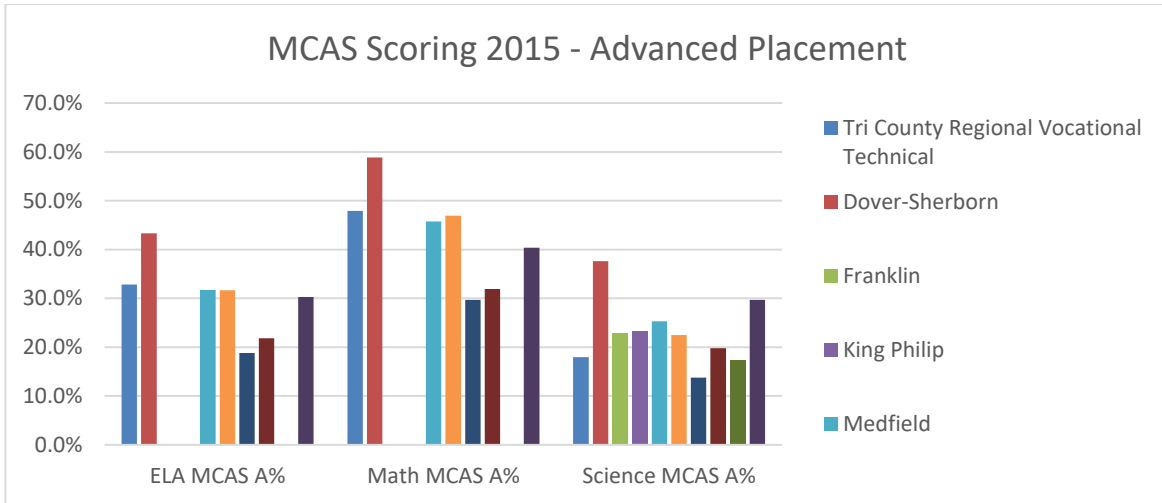
## Appendix K - Advanced Placement in MCAS 2015 in Greater Lowell Region



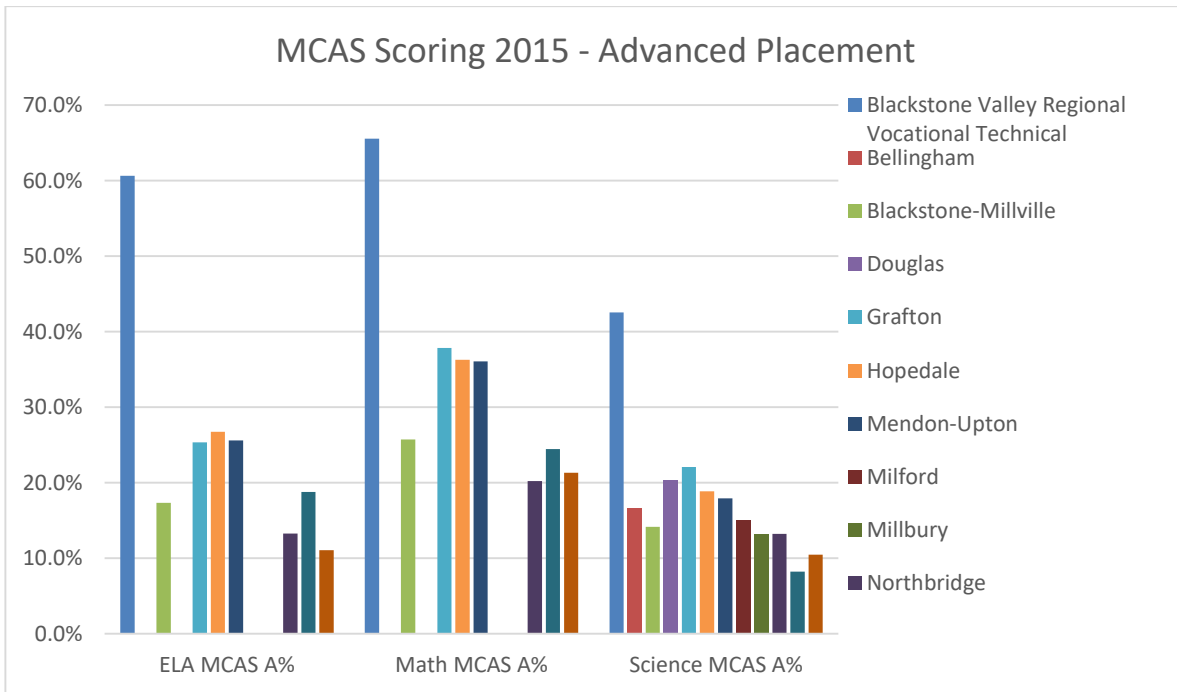
# Career Technical Students and Post-Secondary Education: A Hidden Population in the MA Education System

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## Appendix L - Advanced Placement in MCAS 2015 in Tri-County Region



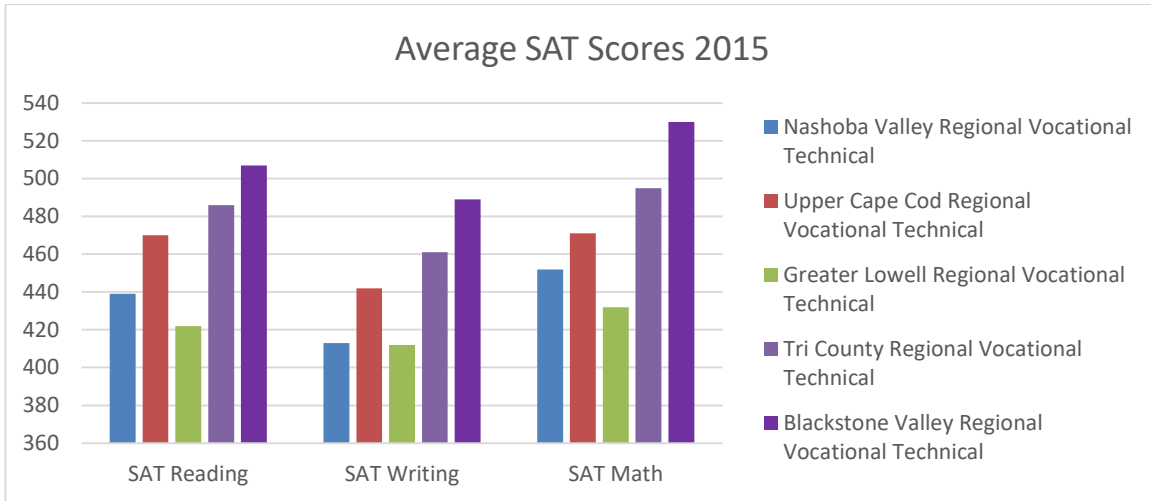
## Appendix M - Advanced Placement in MCAS 2015 in Blackstone Valley Tech Region



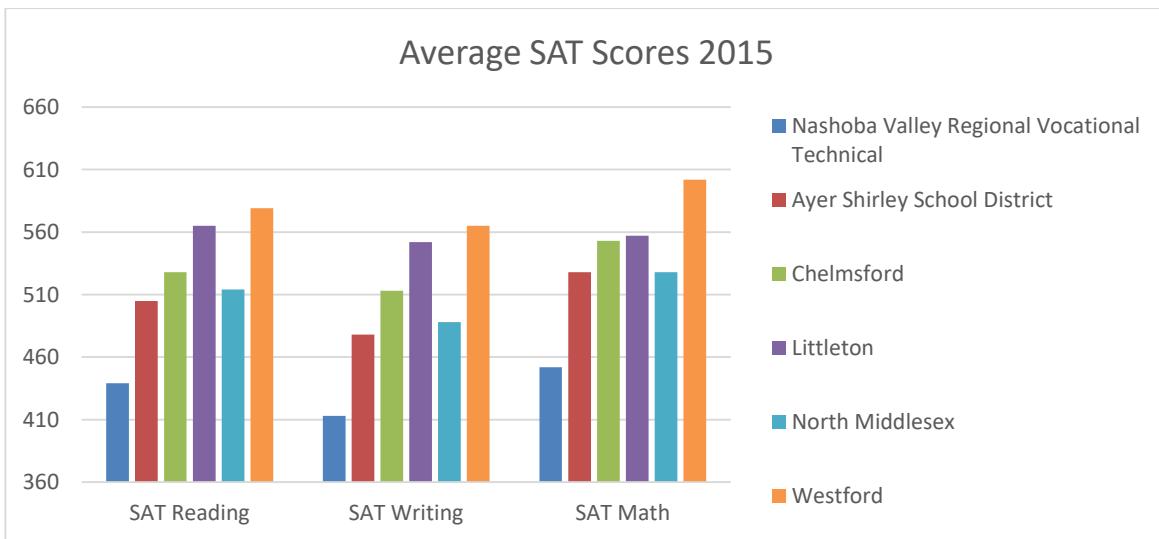
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## Appendix N – Average SAT Scores Career Technical Schools



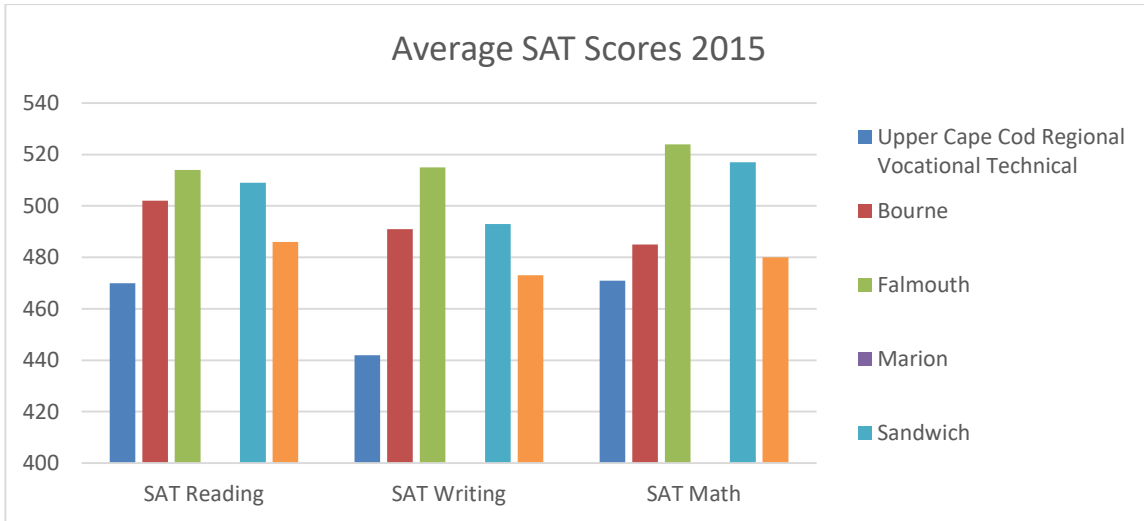
## Appendix O – Average SAT Scores Nashoba Valley Region



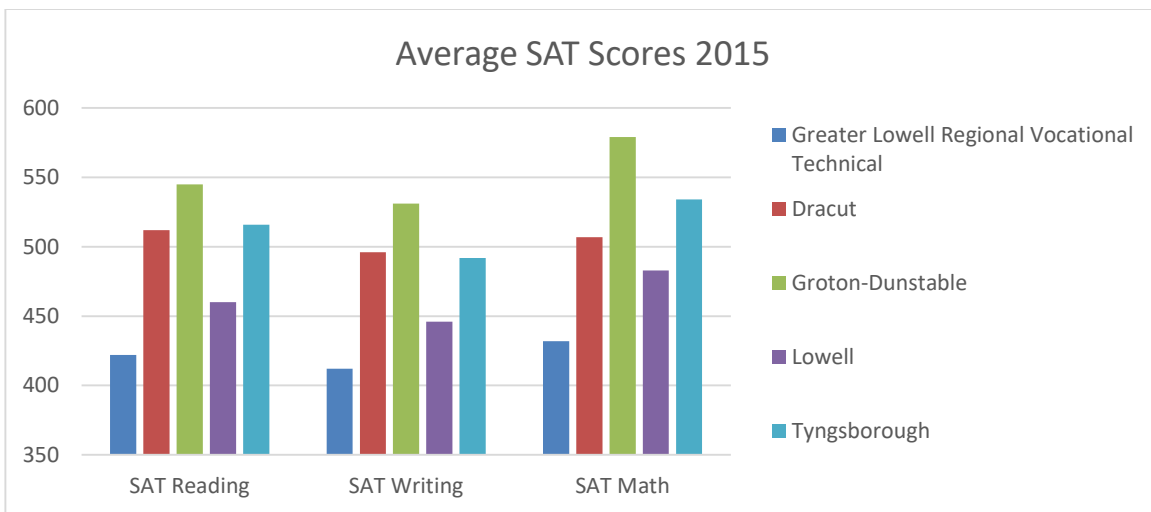
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Appendix P - Average SAT Scores Upper Cape Cod Region



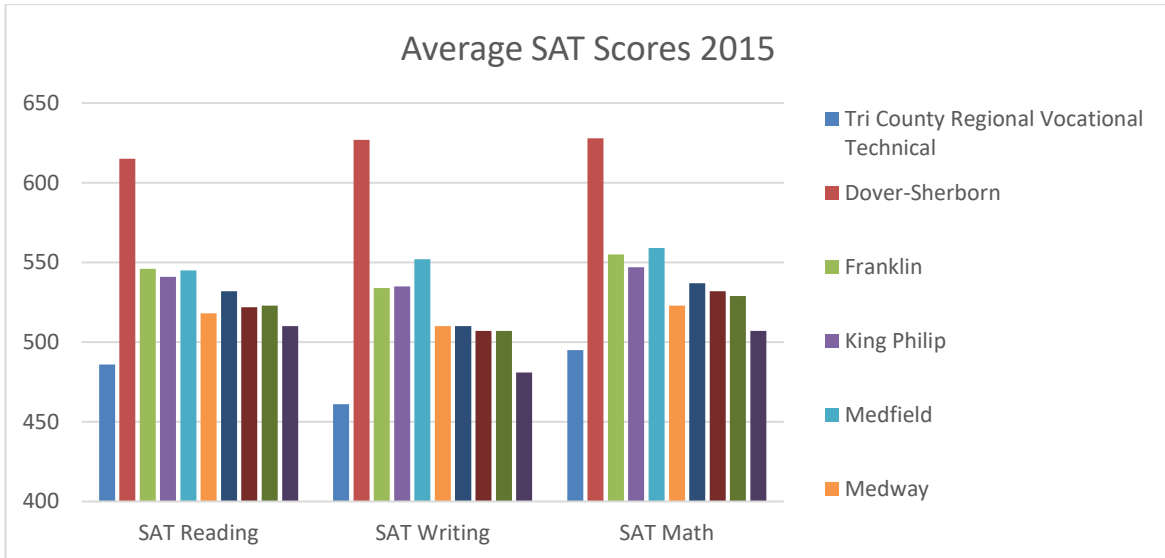
Appendix Q - Average SAT Scores Greater Lowell Region



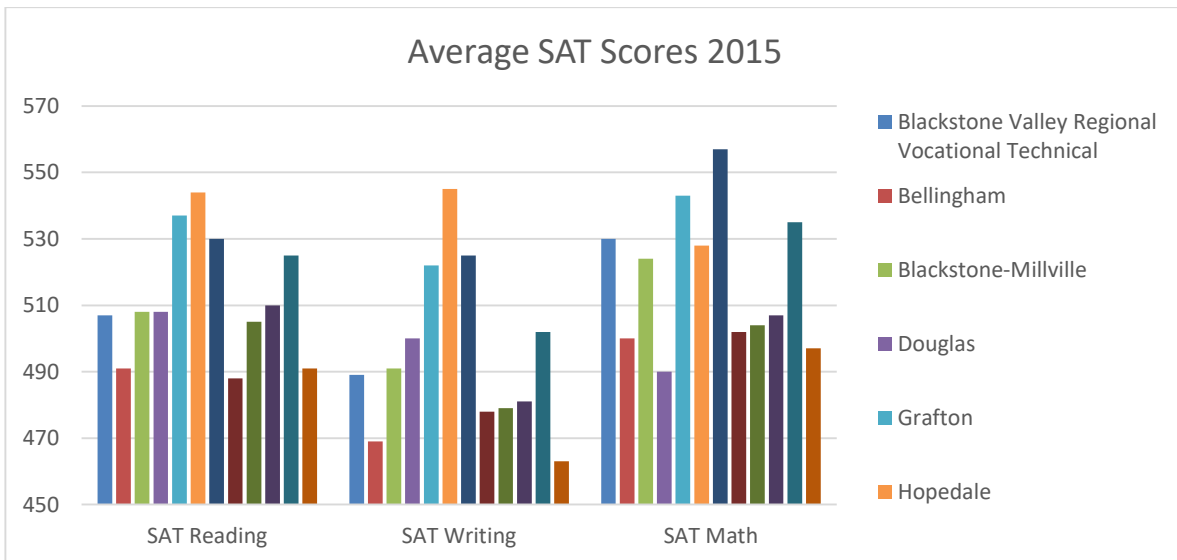
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## Appendix R - Average SAT Scores Tri-County Region



## Appendix S - Average SAT Scores Blackstone Valley Tech Region





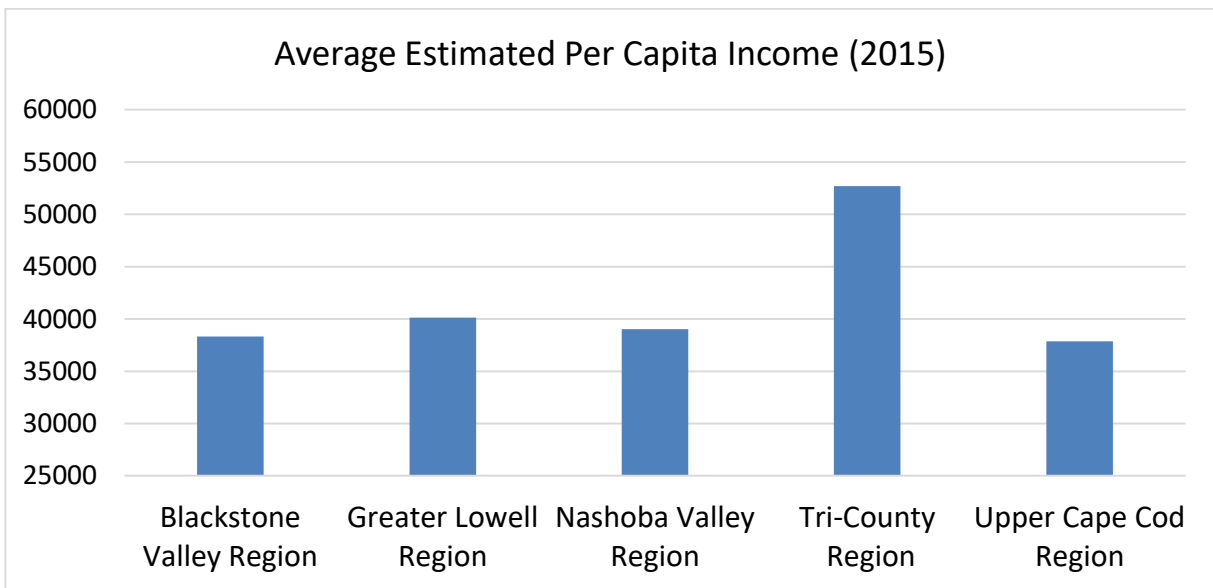
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Appendix T – Average Class Size and Gender Ratios 2015

District Name	Average Class Size	Female %	Male %
Nashoba Valley Regional Vocational Technical	15.7	40.6	59.4
Upper Cape Cod Regional Vocational Technical	15.9	40.8	59.2
Greater Lowell Regional Vocational Technical	17.5	48.7	51.3
Tri County Regional Vocational Technical	16.3	42.3	57.7
Blackstone Valley Regional Vocational Technical	18	52.40	47.60

Appendix U – Average Per Capita Income 2015

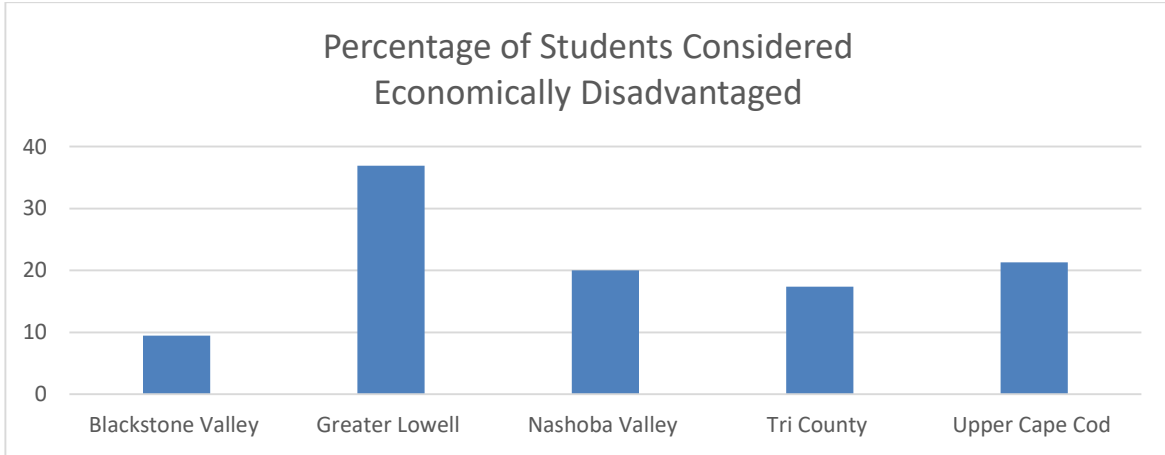


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Appendix V – Percentage of Students Considered Economically Disadvantaged



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