

Benefits of Student Certification: A Study of Automotive Service Managers

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Abstract

Virginia and other states recognize the need for a technically trained workforce and have implemented directives that promote student credentialing. Certifications and other forms of credentialing are used to prove that the recipient has met a predetermined level of competence or mastery of a skill or subject. This study looks specifically at the automotive industry's Automotive Service Excellence (ASE) certification. The primary research question is: Is there a perceived benefit of ASE certification? In addition, two subset questions are explored. The first subset question is (1) Does the ASE certification provide benefits to the employers? And second, (2) do the employers see a benefit of ASE certification to the technicians as compared to those without credentials? This study attempts to answer these questions by polling Virginia automobile service managers regarding their perceptions of the benefits of ASE certification.

A sample of 130 dealership service managers was selected at random from the 2006 Virginia Automobile Dealer Association (VADA) Membership Directory. The VADA has 602 franchised dealerships within the Commonwealth of Virginia. A corresponding sample of 130 independent service managers was selected by matching the zip codes of chosen dealerships with an internet phone directory search. The dealership service manager group had four surveys returned as undeliverable or the dealership was out of business. This leaves them with 126 potential participants. The independent service manager group had seven surveys returned as undeliverable or the service center was no longer in business. This leaves them with 123 potential participants. One hundred seventy-eight surveys were returned giving a 71% overall return rate.

Automotive technicians are employed at either dealerships or independent service centers. It is hypothesized that the perceptions of ASE certification benefits by the two groups are significantly different from each other. A *t* test was conducted regarding the difference between the unweighted composite mean scores of dealership service managers and independent service managers regarding both benefits to the employers and again regarding benefits to the technicians. The tests support the hypothesis that there was a significant difference between the perceptions of the two groups.

The study concludes that these groups perceive there are moderate benefits to the employer and moderate benefits to the technician; however, the dealership and independent service managers differ in their level of agreement in both categories. Dealership service managers agreed more than independent service managers that there were benefits.

Dedication

This dissertation is dedicated to Dr. Richard “Lee” Ross, my mentor, colleague and friend, for his wisdom and guidance throughout my entire professional career. He taught me at an early age that if I believed in myself others would believe in me as well. I am forever grateful to him.

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CHAPTER ONE

Introduction

Development of the Problem

Certification is a form of credentialing that verifies competence within a subject or occupational area. Obtaining the certification should prove that the recipient has achieved a minimal level of competence or mastery of selected standards as identified by the certifying agency.

Certification and other forms of credentialing provide authority for the holder and guarantee that the recipient has met pre-established standards of quality (Foster & Pritz, 2006). Certificate programs for participants are appealing to schools and businesses because they prove program relevancy, accountability, consistent results, and portable credentials (Wilcox, 2006).

In today's marketplace and within our educational communities, possession of certifications has become increasingly popular. Business and industry consider certification as a method of verifying competence of employees as part of their hiring practices. Schools and colleges use them not only to verify student competence, but also to validate quality instructional programs. If students pass certification tests, they can be reasonably assured that their curriculum and teaching methods are sound. Secondary and postsecondary training programs use certifications and other forms of credentialing to align curriculum in order to meet industry standards, and thus, make their students more employable.

There has been an upward trend in the numbers of individuals gaining sub-baccalaureate education. In 1989 only 13% of the population had sub-baccalaureate

education; however, in 2002 the total was above 28%, and continues to rise (Grubb, 2002).

States such as Virginia, Georgia, Pennsylvania, Louisiana, and Texas currently use certifications and other forms of credentialing as an important part of their secondary and postsecondary educational training programs (Wilcox, 2006). The Virginia Standards of Quality, a section of the Code of Virginia, state that “. . . Career and Technical education programs shall be aligned with industry and professional standard certifications, where they exist” (Code of Virginia, 2005). Virginia uses certification to meet high school graduation requirements through standard and verified credits. In other words, students can satisfy requirements for a high school diploma by successfully passing verified credit courses. In Virginia, students can earn verified credit by passing certification or licensing exams. In addition, selected certifications allow students to earn the Career and Technical Education and/or Advanced Mathematics and Technology seals on their high school diplomas.

Texas has established a Skill Standards Board that uses certifications and other skill standards to provide guidelines for workforce education. In Louisiana, a joint effort of governmental and business leaders has established the “Certifying the Future” initiative that uses certifications to improve workforce development programs (Wilcox, 2006).

It is easy to recognize and appreciate the emphasis being placed on sub-baccalaureate certification by employers and educational leaders; however, it is important to determine whether there are substantial benefits to obtaining these certifications. The economic benefits to bachelor’s degrees and other professional degrees are well known;

yet, the benefits of sub-baccalaureate certifications have not been well explored. Are the economic returns for students holding sub-baccalaureate education greater than those for students who do not possess this kind of preparation? Are there benefits to partial completion of a certificate or other credential? This topic is timely and important to explore, not only for the individuals seeking the credential, but also for the educational institution and employer. Stakeholders need to know if sub-baccalaureate certifications and other credentials are worth the time and money invested in order to make informed decisions.

Purpose of the Study

This study will examine the benefits to sub-baccalaureate certification programs. Specifically, this study will examine the benefits of the Automotive Service Excellence (ASE) certification for the automotive service technology technician as perceived by the automotive technician service manager (employer). The automotive certification was chosen because the automotive industry leads other certifying agencies in establishing certifying programs, certifying secondary automotive service technology programs, and establishing a formalized relationship between the schools and local employers. In addition, ASE is widely recognized by service technicians, automotive service technology preparation programs, and consumers. Consumers may recognize the ASE symbol that is prominently displayed in automotive service centers and on clothing worn by the service technician. Typically, service technicians with ASE certification display their ASE certificate in the customer waiting areas.

Research Questions

The primary research question is: Is there a perceived benefit of ASE certification? In addition, two subset questions are explored. The first subset question is (1) Does the ASE certification provide benefits to the employers? And second, (2) do the employers see a benefit of ASE certification to the technicians as compared to those without credentials? In addition, the data collected will allow the analysis of the differences between the perceptions of automotive service managers in dealerships versus independent auto servicing centers. This distinction is important because both groups hire automotive technicians; however, the hiring and training practices are usually different. Dealerships must adhere to stricter guidelines imposed by the manufacturer for training and employment. Independent service centers can be more flexible in their hiring and training. This may have an impact on their perceptions of ASE certification.

Current Context of Sub-Baccalaureate Credentialing

When discussing the benefits of sub-baccalaureate credentialing it is important to discuss other contextual issues influencing certification and other forms of credentialing. This section will explore areas such as the current status of sub-baccalaureate education, the benefits of sub-baccalaureate education for stakeholders, and the current movement for schools to provide certification or other credentialing opportunities.

Current Status of Sub-baccalaureate Training

The benefits of completing a baccalaureate or associate degree are well documented; however, the purpose of this inquiry is to determine the benefits to a secondary Career and Technical Education (CTE) credential or the benefits to taking a portion of the training without finishing the associate or baccalaureate degree. At least

60% of our labor force is comprised of individuals with at least a high school diploma and less than a baccalaureate degree (Grubb, 1995). The sub-baccalaureate training population is growing with this group making up 28% of the labor force (Grubb, 2002). Eighty percent of the high school graduates report that they have some college or postsecondary credits, but do not hold an associate's or bachelor's degree (Grubb, 1993). Over half (53%) of individuals under 30 have at least attempted college; however, less than a quarter of them actually achieve a college degree (Grubb, 1997). Unfortunately, these students enter college with the intention of obtaining a baccalaureate degree; however, most leave without any true marketable credential. Half of the high school graduates who do not go on to college do participate in some kind of postsecondary training (Kerckhoff & Bell, 1998).

The demand for individuals with technical skills beyond the high school diploma and less than a baccalaureate degree has risen substantially over 25 years (Grubb, 1997). Through the year 2010, most of the future job openings in heavy demanded careers such as health occupations technicians and related support, marketing and sales, and computer technicians will require training beyond high school, but less education than a bachelor's degree (Silvestri, 1993).

Benefits to Employers and Credential Holders

For employers, certification and other forms of credentialing offers an insight into a potential worker's technical skills. It serves as a proof and documentation of skill competencies. It can also assist them in evaluating a potential worker's employability skills. Credentialing can often signal the productivity of potential employees when limited information is available (Bills & Wacker, 2003). According to the Policies

Commission for Business and Economic Education (2003) credentialing benefits employers by assisting in the recruitment of employees, reducing training time and expense, and enhancing customer confidence in the work being done (*This We Believe About Industry Certification*, 2003). For credential holders, credentialing provides the indication of technical competence, and can lead to higher potential earnings as well as opportunities for advancement (*This We Believe About Industry Certification*, 2003).

Credentialing to Verify Student Competence

Virginia and other states recognize the need for a technically trained workforce and have implemented directives, laws and programs that promote student certification and other forms of credentialing. During his term of office (2001-2005) Virginia's Governor, Mark R. Warner, took a personal interest in student credentialing and directed the Virginia Board of Education, the Virginia Department of Education, and local school divisions to incorporate industry recognized certifications and other credentials in an effort to verify student achievement for secondary and postsecondary Career and Technical Education (CTE) courses.

In reaction, the current Virginia Standards of Quality (SOQ), a part of the Code of Virginia, specifically state that Career and Technical Education programs should be aligned with industry and professional standard certifications. The Virginia Board of Education has approved 171 credentials or certifications for 76 CTE program sequences. Certification exams can be used for earning Career and Technical seals on diplomas and awarding student selected verified credit (DeMary, 2002). The Virginia Department of Education and other educational leaders see certification and other forms of credentialing as a way of assisting their students to secure specialized employment, and therefore, a

more financially rewarding career. To that end, they are providing training and financial assistance to teachers and students for gaining industry recognized credentials (DeMary, 2005; Williams, 2005).

Significance of the Study

This study regarding the benefits of ASE certification will enhance the body of knowledge concerning sub-baccalaureate credentialing. Current research, including the literature analyzed in this study, focuses on the benefits of credentialing for postsecondary students. There has been limited research conducted regarding the specific benefits of certification for employers or certificate recipients. ASE certification was chosen because the automotive industry leads other industries in promoting certification for secondary students and potential employees. ASE certification is widely known by those in the automotive industry. Consumers may recognize the ASE symbol that is prominently displayed in automotive service centers and on clothing worn by the service technician. Typically, service technicians with ASE certification display their ASE certificate in the customer waiting areas.

Information collected from this study will assist school systems and employers in determining the benefits to high school trained automotive technicians. Schools will be better prepared to advise students about the field of automotive service technology and the benefits of certification. In addition, this study will show to what degree Virginia automobile dealers and independent automotive service centers utilize certification as a signaling device for potential employee competence. This information is crucial as school divisions develop certification programs within automotive and other instructional areas.

In addition, the information will help identify strengths and weaknesses of our current training and certification programs.

Definitions

American Heritage Dictionary defines *benefit* as: “1. Something that promotes or enhances well-being; an advantage; or help; aid; 2. A payment made or an entitlement available in accordance with a wage agreement, an insurance policy, or a public assistance program; 3. A public entertainment, performance, or social event held to raise funds for a person or cause; or 4. *Archaic* A kindly deed.” Throughout this dissertation the word *benefit* or *benefits* refer to something that enhances well-being, provides an advantage or provides payment in accordance with a wage.

The terms *credentialing*, *certification*, and *licensure* are often used interchangeably by the public and even governmental agencies (Mahlman & Austin, 2002). A good example of this term usage is within Virginia educator license renewal. Every five years an educator must “re-license”, however the terminology listed by the Virginia Department of Education is “recertification.” Educators do not gain “certification,” they gain “licensure.” The term *credentialing* encompasses the specific terms of certification and licensure and is used in generic terms. In addition, terms related to the types of credentials studied within this review are defined.

Credentialing

The term *credentialing* refers to the entire domain of providing recognition for meeting predetermined qualifications or standards set by a credentialing body. (Mahlman & Austin, 2002).

Registration

Within a *registration*, recipients simply register their name with the credentialing body and are allowed to practice their occupation. Individuals do not have to pass any exam to be registered (Mahlman & Austin, 2002).

Certification

Certification is more specific and usually involves passing an exam of established standards. The certification often is a signal to the public that the recipient meets the minimum competency for the job and is thus qualified to carry out the duties (Mahlman & Austin, 2002).

Industry certification validates industry specified basic skills. Students earn industry recognized certification by passing an exam developed to measure competency.

Licensure

Licensure gives a person the right to practice the craft and is usually established to protect the public. A governmental agency normally grants permission to practice the occupation provided the person meets the necessary qualifications. (Mahlman & Austin, 2002).

Types of Credentials

Baccalaureate degrees are offered by colleges and universities and take approximately four years to complete. The *high school diploma* is awarded after successful completion of the high school curriculum. A credential earned between high school graduation and the beginning of a baccalaureate program is referred to as *sub-baccalaureate*. There are various types of sub-baccalaureate credentials discussed within

this study. They include *high school diplomas, vocational associate degrees, academic associate degrees, postsecondary vocational training, certificates and licensure.*

Terminology Specific to Automotive Service Technician Certification

Automotive Service Excellence (ASE) is a series of tests regarding automotive subjects administered by the National Institute for Automotive Service Excellence. The ASE exams are the industry standards for proving competence in automotive subjects (National Institute for Automotive Service Excellence, 2006).

National Automotive Technicians Education Foundation (NATEF) is the organization responsible for evaluating technician training programs against automotive industry standards. Training programs that meet the standards are recommended for accreditation through ASE (National Automotive Technicians Education Foundation, 2006).

Automotive dealerships represent larger automobile manufacturers and service the new and used cars that they sell. The *service department* normally employs *automobile service technicians* and a *service manager* to oversee their work.

Independent Service Centers are usually a small business that services all makes and models of cars. They do not typically sell the cars that they service, and have no relationship with the automobile manufacturer. Independent Service Centers employ technicians and service managers to repair cars.

Limitations of the Study

1. The analysis used in this study was conducted using only the automotive industry and ASE certifications. Because of this it may be

difficult to generalize the benefits of secondary ASE certification to other training areas offering certification.

2. Certification of technicians for the automotive industry, as well as other trade industries, is relatively new. Few technicians have actually gained ASE certification as compared to the larger numbers that graduate from automotive training programs. Historically, technicians have not needed ASE certifications to practice the craft; therefore, ASE certified technicians are small in comparison to the total population of practicing technicians. Service managers probably have experienced a limited number of ASE certified technicians as compared the larger non-certified group to base their responses. Because of this, the responses of these individuals may be unduly influenced.
3. Only Virginia automotive dealers identified by the Virginia Automobile Dealers Association (VADA) 2006 Membership Directory and independent service centers identified through an internet phone directory search have been selected to participate in this study. If dealers are not listed in the VADA membership directory they were not included. Independent automotive service centers were chosen at random and matched by zip code with a selected dealership. VADA was chosen because they maintain a large database of automotive service dealerships.

Organization of the Study

Chapter One provides an introduction to the study as well as the significance and limitations. Chapter Two gives a review of previous research regarding credentialing and describes the need for further research. Chapter Three describes the study and provides the methodology for the study. Chapter Four describes the findings of the study, and Chapter Five gives the summary, conclusions, discussions, and recommendations.

CHAPTER TWO

Review of Research

Background

The primary purpose of this review is to examine and critique the existing literature that specifically analyzes the benefits of sub-baccalaureate credentialing. The guiding question for this review is: Is there a perceived benefit to sub-baccalaureate credentialing? To provide the background needed to answer this question, the following factors are considered: (a) the current literature that studies the benefits of sub-baccalaureate education, and (b) a synthesis of studies that analyze the benefits to sub-baccalaureate credentialing. In addition, a summary and analysis of the literature is presented with commentary regarding the need for continued study.

Research in Credentialing

Only six studies meeting the selection criteria of peer reviewed studies using national data sets were analyzed at depth, however, the topic of sub-baccalaureate credentialing has been explored by others. Lewis et al. (1993) reviewed previous non-peer reviewed research and found that there was much conflict regarding the evidence of the effect of credentialing. They note that while some researchers contend that secondary vocational training has a positive effect on earnings and employment (Campbell, Basinger, Dauner, & Parks, 1986; Kang & Bishop, 1989), others find negative results (Daymont & Rumberger, 1982; Griffin & Alexander, 1978). Within the postsecondary arena, some studies find little or negative earnings effects of sub-baccalaureate training (Pincus, 1980; Wilms & Hansell, 1982), while others find positive effects (Blair et al., 1981; Ghazalah, 1987; Grubb, 1992; Horn, 1989; Middleton & Demski, 1989).

The six studies reviewed further in this literature use either the National Longitudinal Study of the Class of 1972 (NLS72), High School and Beyond (HSB) or Survey of Income and Program Participation (SIPP). In addition to the NLS72, HSB and SIPP data sets two other national data sets were used to examine the benefits of sub-baccalaureate credentialing. The National Longitudinal Survey of Youth (NLS-Y) followed graduates between 1976 and 1983 and the National Survey of Adult Literacy (NALS) interviewed a random sample of the population in 1992 (Grubb, 2002). Researcher Rivera-Batiz (1998) conducted a study using the NALS data set, and according to Grubb (2002) had results that support the NLS72 results for certificates indicating a zero return for both men and women (Grubb, 2002). Researchers Kane & Rouse (1995b), Surette (1999), Leigh & Gill (1997), Groot, Osterbeck & Stern (1995), and Averett & D'Allesandro (2002) used the NLS-Y data set. According to Grubb (2002) the NLS-Y research supports the contention that small amounts of sub-baccalaureate education do benefit some individuals. In addition, the research supports the benefits of completing the associate or bachelor degree over two or four years of credits, respectively.

A review was conducted by the National Center for Educational Statistics that analyzed data from the High School and Beyond (HSB) survey of American high seniors in 1980. This data set is defined later in the review. This research echoes the work of Kerckhoff and Bell (1998) and Lewis et al. (1993) that used the same data set. In addition, the researchers found that socioeconomic background was more positively related to higher earnings than was the training received (Zucker & Dawson, 2001).

Research Synthesis

Does sub-baccalaureate credentialing significantly increase earnings above what could be achieved with a high school diploma alone? The first three studies utilize the NLS72 data (Grubb, 1993, 1995; Kane & Rouse, 1995); the next two studies utilize the NSB data (Kerckhoff & Bell, 1998; Lewis et al. 1993); and the last study utilizes the SIPP data (Grubb, 1997).

Earnings Returns to Sub-Baccalaureate Education Using the NLS72 Data

In the following section, a study using the NLS72 data (Grubb, 1993) is analyzed with two studies that contradict the study (Kane & Rouse, 1995) and/or correct (Grubb, 1995) the flawed results.

A study conducted by Grubb (1993) examined the economic returns to postsecondary education using data from the National Longitudinal Study of the class of 1972 (NLS72). The study showed limited monetary returns for students who enter college and fail to complete the degree; however, the data does indicate that by gaining a credential it allows people to be placed in occupations where they can get more experience and pay. Once the experience is realized the credential is not as influential. The study results indicate that credentialing is more economically beneficial for women than men.

The NLS72 is a national probability sample of seniors in the class of 1972. Participants were followed up in 1973, 1974, 1976, 1979 and finally in 1986, fourteen years after high school. Members were asked within the study their probability of pursuing postsecondary education and the results were compared against a transcript study done in 1984-85 (Jones, Baker, & Borchers, 1986). Grubb (1993) found the

difference was small for those with the highest abilities compared to 10-15% for those with the lower grades and abilities.

The study included 7,546 participants (women = 3,607 & men = 3,939). The study omitted individuals with no earnings, who were not high school graduates, and who had post bachelor's degrees. The results looked specifically at the effects of postsecondary education on earnings in relation to the earnings of individuals with only a high school diploma.

Grubb (1993) identified the dependent variable as total annual earnings in 1985. Schooling was described by the binary variables of vocational certificates, vocational associate degrees, academic associate degrees, and baccalaureate degrees. If an individual had not completed the degree he/she was described by the type of institution attended such as public community colleges, public technical institutes, private junior colleges, and the credits he/she completed.

The NLS72 data contains two different kinds of information about postsecondary education. For the time period up to 1979 transcript data were available and used. After 1979 transcript data were unavailable; therefore, self reporting of postsecondary activity was necessary. Self reporting data were categorized as self reported certificates, academic associate, vocational associate, and baccalaureate degrees. Non-completers were described by the number of months they attended an institution without completing credentials. Grubb (1993) stated that one problem with self reported activity is that the information may be exaggerated. Experience was classified as current job and previous experience. Discontinuous time was factored if the experience had gaps. Ability was factored by including a comprehensive test of math and verbal abilities conducted in

1972. Family background, parental income, and socioeconomic status (SES) were noted; however, due to missing data the variables were omitted.

A regression analysis using simple correlation coefficients was conducted to determine the effect of credentialing on earnings. Variables such as experience, demographics and achievement were controlled and reported. Overall results revealed that men earning an associate's degree earned more than men with a high school diploma, but significantly less than men with a bachelor's degree. A certificate without the associate's degree did not increase the wages or earnings. For women, both an associate degree and certificate offered gains over the high school graduate. For both men and women, failure to complete the associate degree offered no increase in earnings.

According to the research, the effects of the baccalaureate degree credential provided \$10,202 a year more than a high school diploma for men. However, most of the increase may be attributed to a higher socioeconomic status, higher ability and more experience in the labor market. By controlling the variables of achievement and socioeconomic status (SES) a certificate recipient would make \$2,431 a year more than someone with the high school diploma only, however, when experience is factored, any gain may be explained by experience; not the certificate.

For women, the advantage for certificates and postsecondary education was greater than that of men. However, like men, when experience and on-the-job training were factored, the effects were insignificant. Grubb (1993) stated that individuals with certificates and associate degrees were given access to jobs that provide more on-the-job training and experience that translated into higher earnings. For middle age adults, sub-baccalaureate credentialing offers little increases in earnings.

The results are challenged in another study reviewed (Kane & Rouse, 1995). Kane and Rouse refute Grubb's (1993) conclusions that postsecondary college students who do not complete degrees earn no more than high school graduates. They also refute the concept that associate degrees benefit recipients by placing them in jobs that provide better access to jobs with higher earnings. They state that even those who do not complete the degree earn significantly more than high school graduates.

Kane and Rouse (1995) used the NLS72 data and selected a sample of 3,735 men and 3,527 women. They reported that Grubb (1993) used weighted counts of 4,039 men and 3,637 women. It is important to note that the sample size given by Kane and Rouse did not match the population numbers given within the Grubb study (women = 3,607 & men = 3,939).

Kane and Rouse reanalyzed Grubb's (1993) data and according to their analyses found several errors in how the results were calculated. First, the variables of course credits from community colleges and private colleges were reversed. In Grubb's analysis 96% of the two year college population was from a private school and the remainder was from the community college when in actuality the numbers were reversed.

Second, the variable of specific job experience allowed for double counting of periods of employment and unemployment (Grubb, 1995). Kane and Rouse (1995) argued that over half of the participants with negative "other experience" had no postsecondary training thus causing a positive correlation between education and experience and the education coefficients to decline. When Grubb (1995) corrected the data (Grubb 1993) he concluded that certificates and associate degrees did positively affect earnings by providing job access that provided more experience and, thus, more

earnings. This corrected an earlier statement that certificates and associate degrees had no effect on earnings.

Third, there was an error in the composite test score used to control for ability differences. According to Kane and Rouse (1995), 147 participants in Grubb's (1993) study scored below the lowest possible score of -18.59 and 69 participants scored above the maximum score of 85. Kane and Rouse (1995) stated that Grubb's (1993) mean test score of 37.9 ($SD = 37.1$) was corrected to 47.9 ($SD = 18.7$). According to Grubb the variable was read with an incorrect format statement, and therefore, the correction made a insignificant difference in the results (Grubb, 1995).

When conducting the study again, Grubb (1995) used an updated version of the NLS72 data that corrected errors. The original data were first released by the National Center for Educational Statistics in 1988. The new version completed in 1990 included transcript errors that were corrected.

Grubb (1995) contends that this corrected study still finds that women, not men, have earnings benefits from certificates. The corrected study continues to hold that women and men have higher earnings if they complete vocational associate degrees; also those with some college, but no credential, have wages and earnings that are only slightly higher than those with only the high school diploma, and that the gains are not significant.

After correcting the mislabeled and incorrectly measured variables, Kane and Rouse (1995) concluded that individuals who fail to complete an associate's degree do earn more than those with a high school diploma only. The results remained significant, even when variables for experience were controlled.

Earnings Returns to Sub-Baccalaureate Education Using the HSB Data

In the following section, two studies using the HSB data were analyzed (Kerckhoff & Bell, 1998; Lewis et al., 1993). The HSB is a survey of American high school seniors in 1980. Demographic data were collected on the subjects in 1980, 1982, 1984 and 1986. HSB data were collected for the National Center for Educational Statistics by the National Opinion Research Center. The Lewis et al. (1993) study focused on postsecondary vocational education influences on earnings, while the Kerckhoff & Bell study focused on the influences of specific sub-associate degree certifications and training on earnings.

The first study reviewed using the HSB data was conducted by Lewis et al. (1993). The study examined whether postsecondary vocational education had significant effects on efficiency and equity versus those who chose not to attend. The researchers identified the benefits and disadvantages of the HSB data over other databases. First, its event history provided an account of subjects' work and school activities on a month-to-month basis and second, it was nationally focused and longitudinal. The problems with HSB data were that employment and earnings were reported in two ways using figures that did not match. Participant monthly and weekly reports were gathered in addition to self-reported yearly totals. Second, the data did not reflect the current local and national economic conditions that may have effected employment and earnings. Third, the data did not include the participant's high school transcripts (transcripts were included in the 1982 senior cohort), and fourth, the study ended six years after the initial data were collected.

The researchers found that postsecondary vocational education did contribute significantly to earnings as compared with those without any postsecondary training. Vocational training proved to be more significant for women than men. The study showed no significant effects regarding employability or movement within socioeconomic status (SES).

The efficiency rationale related to the thought that an investment in training would produce societal gains of an increased standard of living and worker production. The equity rationale related to the thinking that postsecondary training would provide those from typically lower socioeconomic backgrounds such as women, minorities and the handicapped to be provided the opportunity to work in jobs that could raise their earnings and SES.

The HSB data contained 11,955 subjects. Lewis et al. (1993) selected 5,575 individuals who met the criteria of appropriate postsecondary training with complete information. To account for equity issues, sub-samples of 2,148 low SES, 3,112 females and 2,453 males that were selected indicated that they had no further training beyond high school. It appears that 10 individuals were not included in the sub group for equity issues. When females and males are added together the total equals 5,565 vs. 5,575.

Lewis et al. (1993) developed four sub research questions. First, “has the existence of postsecondary vocational programs improved the earnings of students who attended those institutions compared to those high school graduates who did not attend any institution?” To answer this question, the researchers examined the earnings for six groups: all of the sample together, separately by gender, the sample by lowest SES quartile, and then that sample divided by gender. Second, “has the existence of

postsecondary vocational programs improved the employability of students who attended those institutions relative to those of high school graduates who did not attend any institution?” To answer this question the researchers estimated employment functions for all six sub-groups by using the number of months employed during 1985 and also their employment status in February 1986. Third, “has the existence of postsecondary vocational programs contributed to the equity by reducing the intergenerational transmission of SES?” This was analyzed by looking at the upward movement among the SES quartiles before and after postsecondary vocational education. Finally, “does the completion of a postsecondary vocational program, compared to only attendance, make a difference in earnings, employment, of SES?” To answer this question the researchers reevaluated all groups against the completion variable rather than the participation variable.

A multivariate modeling technique using mostly ordinary least-squares (OLS) - based multiple regression was used. Multivariate analyses were also used for the sub-groups of low SES, gender and high school graduates. The most recent earnings and employment history made up the dependent variables.

The independent variables were the student’s community context, descriptive characteristics, student and parent’s SES, academic characteristics, current educational and employment status, and whether a student entered or completed a postsecondary vocational program.

The study indicated that postsecondary vocational education did contribute significantly to earnings as compared with those without any postsecondary training. Those with higher ability scores tended to have higher earnings. Blacks, women and

disabled individuals earned significantly less than the average. This group earned \$1,700 less than the average earnings for the 1980 high school graduate in 1986 of \$11,565. Women who did not participate in any vocational training beyond high school earned \$1,900 lower than the average.

When analyzing the effect of earnings using the entire population the following regression coefficient results were obtained and reported. Participation in secondary vocational education ($b = -.02, p > .05$) was not significant or as effective as postsecondary vocational education ($b = .37, p < .05$); however, when looking at the women only, both secondary vocational education ($b = .30, p < .05$) and postsecondary vocational education ($b = .41, p < .05$) show positive and significant correlations. In addition, the effects are greater for women in lower SES quartiles than men. Men in all sub categories did not receive significant benefits from postsecondary training. Earnings were greatest for jobs that more closely reflect their training.

The authors indicated that the effects of completing a postsecondary vocational program offered mixed results. For the population as a whole, completing credentials showed a negative relationship (specific data supporting the claim was not provided). When licensure or certification was reviewed specifically, licensure was negative and certification was positive. Neither was significant at the $p < .05$ level. The study found that for the subgroup of women both participation and completion of an associate degree were significant.

These findings regarding the benefits of non-completion of an associate degree differed from the Grubb (1995) and Kane and Rouse (1995) studies using the NLS72 data. Grubb's (1993) initial findings indicated that associate degree completion had

positive effects on earnings while non-completion offered no significant effects. In a later report Grubb (1995) corrected earlier statements indicating that non degree completion did offer some benefits. The Kane and Rouse (1995) study concluded that postsecondary college students who did not complete degrees earned significantly more than individuals with a high school diploma only.

The study determined that there were no significant returns on employment or SES quartile movement for either participating in or completing a postsecondary vocational program. It also indicated that secondary vocational education provided little difference in earnings while postsecondary training did enhance earnings for all sub-groups.

The second study using the HSB data was conducted by Kerckhoff & Bell (1998). They found that postsecondary educational credentials did have varied positive effects on early-labor-force outcomes. The researchers contended that some credentials are of greater value in the labor force than an associate's degree. However, their effects often differed for men and for women. The study also reviewed how credentials influenced movement within occupational status and made comparisons to credentialing in European countries; however, this review will focus on how credentials affect earnings.

The study sample data included 11,147 participants with 2,798 obtaining a postsecondary vocational credential. The researchers identified 1,064 participants who obtained a postsecondary vocational credential that could be classified in a specific credential category and later compared them to the entire group. The study grouped students into three vocational categories: 2-3 year vocational degree, an unspecified

license status, and a specified certificate, license or diploma. Earnings were the dependent variable and were self reported on the survey.

The results were presented in tables that noted non-standardized coefficients. Coefficient differences were noted if the coefficient was significantly higher or lower than some college credits or was significantly higher or lower than a high school diploma at $p < .05$. The authors did not identify how reliability and validity were tested.

The study revealed that postsecondary vocational credential holders earned at the approximate level of an associate degree, however several credentials such as computer or medical technician earned higher while credentials such as nurse assistant and beautician earned considerably lower. Kerckhoff and Bell (1998) noted that there was much variation between the regression coefficient amounts of earnings depending on the credential ranging from $-.69$ to $.36$.

The high school only and some college groups earned significantly less than some with vocational associate degrees. The regression coefficient of the high school only was $-.250$ ($p < .05$) and that of some college was $-.253$ ($p < .05$) groups made significantly small earnings, while the coefficient of vocational associate degrees was $.11$ ($p > .05$).

When comparing those with specific credentials, most of the earnings coefficients were positive, however none were significant. Participants with computer related credentials ($b = .354$, $p > .05$), medical assistant credentials ($b = .34$), and typists credentials ($b = .36$) earned more than some college ($b = -.25$) and those with an associate degree only ($b = -.25$). The only specific credential that received a negative coefficient was nurse assistant at $-.69$ ($p > .05$). In other words, a nurse assistant will earn considerably less than someone with just an associate degree. Kerckhoff and Bell (1998)

indicated that earnings for those with vocational credentials were comparable to that of the vocational associate degree, and that those who had several vocational credentials earn significantly higher earnings than the high school only group. The finding that vocational credentials offer positive earnings is contradictory to the findings of Lewis et al. (1993) using the same HSB data.

When analyzing the genders separately the researchers found that the return on earnings is greater for women than men. Women with vocational degrees and credentials in almost every category, except nurse assistant, earned more than women in the high school only and some college groups. However, men with vocational degrees and credentials did not earn significantly different amounts than those with high school only, some college or the associate degree. None of the coefficients were significant at the $p < .05$ level. In other words, men with vocational credentials do not earn significantly more than what they could earn with only a high school diploma. These findings support the conclusions of Lewis et al. (1993), Grubb (1993, 1995 & 1997) and Kane & Rouse (1995) that sub-baccalaureate training and credentials returns on earnings are much greater for women than men.

A problem with this study is that HSB participants were in their low 20s when the analysis was made. Older participants may have had more opportunities to gain credentials and thus improve the return rate for credentials. Kerckhoff and Bell (1998) agreed with Grubb (1997) that due to the short amount of time between follow-up and the limited age group, HSB data may not reflect an adequate return for training.

Earnings Returns to Sub-Baccalaureate Education Using the SIPP Data

The last study reviewed, Grubb (1997), used the Survey of Income and Program Participation (SIPP) data from 1984, 1987, and 1990 to analyze the benefits of sub-baccalaureate credentials including associate degrees and certificates.

According to Grubb (1997) the SIPP data set had several advantages over other data sets because it included more detail about sub-baccalaureate education. The data included participants from a variety of age groups as compared to NLS72 and HSB that followed a single cohort. In addition, SIPP provided better information about schooling within postsecondary education as compared to other data sets. Another advantage of SIPP over other data sets, such as NLS72 and HSB, was that a longer period of time elapsed between the original study and the follow-up, giving more accurate indication of the effects of the training. A disadvantage of using the SIPP data was that the data were self-reporting, creating a possible bias, and that data structuring was complex making it difficult to extrapolate the information.

This study attempted to answer the following questions: First, are there economic benefits to community colleges and technical institutes? Second, do the benefits of completing some college depend on receiving a credential – a certificate or an associate degree – or does attending postsecondary education for short periods of time, but without receiving a credential, provide economic benefits? Third, are there economic returns to credentials themselves, above and beyond the returns to coursework completed? Fourth, are there differences in returns to schooling over the 1980s? Fifth, what is the variation in returns to sub-baccalaureate credentials by field of study? And finally, are there

differences in the benefits of sub-baccalaureate education depending on whether employment is related to the student's field of study or not?

The 1984 report consisted of 7,982 men and 6,557 women. The 1987 report consisted of 5,452 men and 4,952 women; and the 1990 report consisted of 10,600 men and 9,939 women. Coefficient correlations were used and reported. The measure of the relationship strength was indicated by the multiple correlations squared. To estimate earnings Grubb (1997) used a conventional semi-log functional form with a log of earnings through a linear function of variables. Binary variables were used for formal schooling, job training, experience, and other independent variables. Education was measured in relation to the high school diploma only to determine the effects of postsecondary education or the ill effects of being a high school dropout. Results for men and women were estimated separately. There was not a large enough sample size for race and ethnic groups to estimate the effects with accuracy so they were not included in the study.

The results were presented in tables that noted coefficients and are reported below. All regression coefficients were significant at the $p < .05$ level unless noted. Grubb (1997) found that both certificates and associate degrees do increase the earnings for recipients; however, the return is not as great as for the baccalaureate degree. Using the 1987 report as an example (1987 report used in all examples), the regression coefficient of the return for completing an associate degree was .22 while the regression coefficient of the return for finishing two years of college was .12 and a baccalaureate degree yielded the regression coefficient of the return of .39. In mean earnings the differences between a vocational certificate, two years of study, an associate degree and a

baccalaureate degree over the high school diploma were for men, respectively: \$2,351 (11%), \$1,689 (8%), \$5,671 (24%) and \$9,368 (34%). For women, the differences were: \$2,925 (27%), \$797 (9%), \$3,089 (28%), \$10,344 (57%). Although there were gains in earnings for some credentials and certificates, some provided no benefits. Small amounts of postsecondary education without completing the credential were more beneficial for men than women. One year of training provided a regression coefficient of the return of .16 for men and .09 ($p > .05$) for women.

Grubb (1997) found that both men and women who completed a credential had better benefits than those who did not. Men and women tended to choose different types of occupations with men typically gravitating to jobs that pay better. This finding supports earlier studies (Grubb (1993 & 1995)).

Grubb (1997) concluded that academic associate degrees did not provide significant gains for men or women, however for vocational associate degrees; the SIPP data indicated better returns than previous studies (Grubb 1993) using NLS72 data. SIPP indicated a regression coefficient of the returns of .22 ($p < .05$) for men and .23 ($p < .05$) for women while the NLS72 data returns a zero for men and .09 ($p < .05$) for women. Grubb (1997) stated that a reason for the difference in the data was that the SIPP data had a larger span of ages (25-64) as compared to the NLS72 data which used a single young cohort. In addition, he concluded that the SIPP data may be biased upward by its self reporting of earnings. In contradiction, Kane and Rouse (1995), using the NLS72 data, indicated a regression coefficient of the return of .24 for men and .31 for women for the associate degree.

Synthesis of Research in Earnings Returns to Sub-Baccalaureate Training

The studies reviewed in the previous section focused on the earnings benefits of sub-baccalaureate training, and more specifically vocational training, certificates, and vocational associate degrees; however, it is important to note that the research reviewed is at least 10 to 15 years old. It does not reflect recent significant growth and maturity of credentialing programs. These older studies do not reflect the newer credentials that focus on popular emerging areas such as computer security, mobile electronics and computer aided drafting.

In the following section the information collected from the studies is synthesized and discussed. Categories of credentials and their effect on earnings are presented.

Returns to Earnings from the Bachelor Degree

Although the focus of this literature review is sub-baccalaureate training, it is important to note that the earning benefits of the bachelor degree far exceeds the benefits of other types of sub-baccalaureate training. In studies where the bachelor degree was compared to other forms of sub-baccalaureate training the coefficients on earnings returns were much higher for the bachelor degree (Grubb, 1993, 1995, 1997, 2002; Kane & Rouse, 1995). However, sub-baccalaureate training is important to our society because at least 60% of our labor force is comprised of individuals with at least a high school diploma and less than a baccalaureate degree (Grubb, 1995), and the demand for sub-baccalaureate training has risen substantially over the past 25 years (Grubb, 1997). Through the year 2010 most of the job openings will require training beyond high school but less education than a bachelor's degree (Silvestri, 1993).

Returns to Earnings from the Vocational & Academic Associate Degree

The research indicates that the associate degree does increase earnings; however, not at the level that the bachelor degree (Grubb, 1997) does. For women and men, vocational associate's degree recipients earned more than individuals with only high school diplomas. While Grubb (1997) contends that vocational associate degrees offer returns to earnings, he concludes that academic associate degrees provide no significant gains for men or women (Grubb, 1997).

Returns to Earnings from Vocational Certificates

The research reviewed indicates that postsecondary vocational education does contribute significantly to earnings (Grubb, 1997; Kerckhoff & Bell, 1998; Lewis et al., 1993). One study found that postsecondary vocational credential holders earned at the approximate level of an associate degree, while another study found no significant returns to employment or SES from participating in or completing a postsecondary vocational program (Lewis et al., 1993).

When examining the genders separately, the returns to earnings are much greater for women than for men. For men, vocational training does not significantly increase wages or earnings (Grubb, 1995; Kerckhoff & Bell, 1998; Lewis et al., 1993), and earnings are close to what they would earn with only a high school diploma (Kerckhoff & Bell, 1998). For men, participation in secondary vocational education was not economically beneficial (Lewis et al., 1993).

For women vocational certificates and postsecondary training education benefits are much greater than for men (Grubb, 1993). One study indicated that within most vocational credential categories, except nurse assistant, the return on earnings is greater

than with only the high school diploma (Kerckhoff & Bell, 1998). In addition, only women benefited from secondary (high school) vocational education programs (Lewis et al., 1993).

Returns to Earnings from Partial Completion of the Vocational Certificate

Within the studies there were conflicting opinions as to the benefits of partial completion of a vocational credential or the associate degree. Grubb (1995 & 1997) argues that there are little, albeit some increases in earnings for partial completion of credentials. This view is supported by Lewis et al. (1993) who contend that not completing the credential shows a negative relationship to additional earnings. This differs from Kane & Rouse (1995) who state that there are significant and substantial benefits to postsecondary vocational education without completing the credential. It was surprising to note that overall women tend to benefit more from postsecondary vocational education than men. However men benefit more when the training is for a short amount of time (Grubb, 1997).

Probably one of the most important benefits of the vocational associate degree and the vocational certificate, above and beyond the increased earnings, is that it gives its holders access to jobs that provide more on-the-job training and therefore higher earnings (Grubb, 1993).

Conclusions

Does sub-baccalaureate credentialing significantly increase earnings above what could be achieved with a high school diploma alone? The literature seems to support that it does; however, there is much disagreement as to how much. Kane and Rouse (1995) and Kerckhoff and Bell (1998) contend that there are significant gains for completion,

and even partial completion, of sub-baccalaureate credentials. On the other hand, Grubb (1993, 1995, 1997 & 2002) and Lewis et al. (1993) continue to view the benefits as limited. The researchers tend to agree that the greatest benefits are equated to the particular credential. Some credentials provide substantial economic benefits while others provide none. Vocational credentials, such as computer and medical technicians, are of greater value in the labor market than the typical associate degree and thus, warrant higher earnings. Others, such as nurse assistants and beauticians, are not as valued within the labor market and provide fewer earnings than what could have been earned with only a high school diploma. In those instances, the cost and time for the training may not be worth its return on investment.

The studies reveal that sub-baccalaureate education is more beneficial for women than men. Women who complete certificates and associate degrees have significantly greater returns than men. Men see little to no benefit from vocational certificates and most postsecondary training in relation to what they could have done without any credential.

It seems that the most important benefit to sub-baccalaureate education, including the associate degree, is that credentials give recipients access to jobs that provide more on-the-job training, and therefore, possible higher earnings in the future (Grubb, 1993). Generally occupational experience and expertise have much more influence on earnings than the actual credential; however, it is the credential that allowed them to be placed in the job. Credentialing can often indicate the productivity of a potential worker when limited information is available (Bills & Wacker, 2003).

Within secondary and postsecondary educational institutions across the nation there is a strong emphasis being placed on incorporating credentialing as part of training programs for validation of student and program competence; however, there is little research that supports or disclaims its merits. At first glance, student and program credentialing make sense. Sub-baccalaureate credentialing shows that the recipient has met pre-established standards, and it should certainly make students more employable. Nevertheless, there has been little research done to prove this assumption.

The research reviewed within this literature review examines the economic benefits for the credential recipient; however, there is little research regarding the benefits of incorporating credentialing standards as part of a training program. Is there a benefit to incorporating credentialing and certifications within training programs, or are the educational institutions just wasting their time and money? Legislation such as the Carl D. Perkins Career and Technical Education Improvement Act of 2005 is enhancing the emphasis placed on verifying student competence in both secondary and postsecondary Career and Technical Education programs through industry-based occupational credentialing. However, the current research, including the studies within this paper, does not address the benefits of verifying competence of students for employment or earnings. This lack of verification is especially true for secondary career and technical education. In addition, data sets that are currently used to study credentialing are over ten years old and do not reflect the benefits to the current student population. Does credentialing for secondary Career and Technical Education students provide access to higher paying jobs versus what could be obtained without credentials?

Future Study

After a review of the literature regarding the benefits to Career and Technical Education credentials, it was determined that there is a gap in the research as to the benefits of credentialing for secondary students. Most of the research looks at postsecondary credentialing and does not investigate the benefits of secondary education. With the current emphasis regarding secondary credentialing by the Virginia Department of Education, the Virginia Board of Education, and the Virginia Legislature, a study that looks at the benefits to secondary credentialing is particularly timely. In addition, there seems to be little research regarding whether secondary credentialing is an appropriate signal of competence for potential employers and, therefore, a reason to employ the credentialed recipient. In other words, are employers hiring secondary credential holders at a higher rate than those without credentials? More importantly, are employers paying the credentialed employee more than they would pay someone without credentials?

To answer the question a qualitative study is proposed that surveys potential employers as to their perceptions of whether credentials obtained are an appropriate signal to occupational competence and are used as a prerequisite to hiring. In other words, are employers more willing to hire credential holders over non-credential holders? Also, are they willing to pay them more than non-credential holders? The proposed study looks specifically at the automotive industry's benefits to ASE certification. Employers who hire technicians are free from legislative regulation to hire technicians with or without ASE certification.

Employers of secondary ASE certification holders, including automobile dealers and independent automotive service centers were surveyed as to their perceptions of ASE

credentialing benefits specific to their occupational area. For example, the automotive employers were asked about the benefits of Automotive Service Excellence (ASE) certification and whether the pay for a credentialed employee is more than someone non-credentialed.

This study would show if employers are actually hiring and compensating based upon credentials obtained within the secondary Career and Technical Education automotive programs and to what degree. The information gathered in this study could be used by the Virginia Department of Education, state legislators, and school administrators to justify or abandon credentialing options as part of secondary Career and Technical Education programs based on the program relevance.

CHAPTER THREE

Methodology

Introduction

This chapter describes the methods used for collecting and analyzing data used within the study. It identifies the population and how a survey sample was selected. It will describe the survey instrument and how the survey instrument was developed.

Population

According to Ary, Jacobs & Razavieh (1996) it is crucial that the sample selected is representative of the population. The process in this study includes drawing samples from the population of dealership service managers and independent service center managers. The population for this study included service managers at the 602 automotive service dealerships identified in the 2006 Virginia Automobile Dealers Association (VADA) Membership Directory. VADA provided the addresses for the automobile dealerships. Once a sample dealership was randomly selected, a service manager at an independent service center matching the zip code of a dealership service manager was selected at random through an internet address search.

Instrumentation

To create an appropriate sample size from the population of 602 dealerships a sample size of 120 (20%) was chosen. To randomly select 120 participants, each 5th member from the VADA's alphabetical membership list was chosen. To ensure that at least 20% would be returned, an additional 10 members were selected above the 120 original participants. These participants were selected by continuing to count every 5th member (returned to the beginning of the directory). This gives a sample size of 130

(22%). The population of independent service centers is unknown because there is no definitive database of independent service centers. Independent service centers were matched with selected dealerships according to their zip codes. *Google Maps* (internet business directory) was searched under the category of *automotive* by zip code. The first independent service center that contained a name that obviously described an automotive service center, such as *garage* or *service center*, was selected. By adding the 130 service managers at dealerships and the zip code matched 130 service managers at independent service centers there were 260 survey participants. The survey was directed to the *service manager* at both the dealerships and independent service centers.

A survey was the primary instrument used to gather data to answer the research questions. Professionals from the Virginia Department of Education and automotive service professionals assisted in the development of the survey. Professionals in the automotive field reviewed the questions and offered suggestions for improvement. The survey questions were specifically designed to answer the primary research question: Is there a perceived benefit of ASE certification? In addition, two subset questions are explored. The first subset question is (1) Does the ASE certification provide benefits to the employers? And second, (2) do the employers see a benefit of ASE certification to the technicians as compared to those without credentials? In addition, the data collected allows for the analysis of the differences between the perceptions of automotive service managers in dealerships versus automotive service managers in independent auto servicing centers.

Validity

According to Ary, et al. (1996) and Bell, (1999) content validity can be gained by pre-testing the survey items. Judgments are elicited from colleagues familiar with the study pursuant to the appropriateness and clarity of each item. A group of 10 Career and Technical educators were asked to determine whether the survey questions would answer the subset research questions. It was determined by their responses that the questions did answer the subset research questions.

Reliability

The survey was tested for reliability using Cronbach's alpha. The Cronbach's alpha is "an internal measure of reliability or consistency of the items in an index. It can be used for Likert scales" (Vogt, 1999). The Cronbach alpha score for survey questions 1-10 was .90 and for survey questions 11-20 was .87. Huck (2000) suggests that Cronbach alpha scores should be as close to 1.00 as possible.

Factor Analysis

According to Vogt (1999), a factor analysis is often used in survey instruments. A factor analysis assists in determining whether some variables may be related or whether some factors are grouped together or reduced. In this study, it assisted in determining which factors do not fit within identified constructs and should be removed.

A Principal Components analysis with a Varimax rotated solution was conducted on research survey questions 1-10 (benefits to the employer) and on survey questions 11-20 (benefits to the technician).

Data Collection

The method of data collection was through the use of a survey instrument. The instrument was designed by the researcher with assistance from professionals from the Virginia Department of Education and automotive professionals attending the SkillsUSA conference in Kansas City, Missouri (June 19-23, 2006). The survey has been developed by focusing on the research question “Is there a perceived a benefit of ASE certification?”

A 4-point Likert scale was used for responses. The Likert scale helps the respondents to discriminate their answers better than a two-part agree or disagree answer. The automotive service managers were provided detailed instructions on how to complete and return the survey. All assurances of confidentiality were provided.

Assignment of Values to Survey Responses

According to Best & Kahn (1993) surveys should be assigned numerical values and the values should be weighted. Positively stated items had numerical values of 1 – Strongly Disagree; 2 – Disagree; 3 - Agree, 4 – Strongly Agree; Not Applicable – not assigned, and Best & Kahn (1993) state that weights for negative or unfavorable stated items should reversed. They contend that disagreement with an unfavorable statement is psychologically the same as agreement with a favorable statement. Any negatively stated items had numerical values of 4 – Strongly Disagree; 3 – Disagree; 2 – Agree; 1 – Strongly Agree; Not Applicable – not assigned.

It is important that survey instruments be reviewed by people familiar with survey instruments and the subject area being surveyed (Bell, 1999). Professionals from the Virginia Department of Education Office of Career and Technical Education,

representatives from the Virginia Automobile Dealers Association, and service managers for both dealers and independents reviewed the survey and provided feedback for the final instrument.

Pilot Study

It is important to have survey instruments piloted by people who form the population of the study and are knowledgeable of the field to identify ambiguities, misunderstandings, and other inadequacies (Bell, 1999). The survey instrument was tested by hand delivering it to five service managers at dealerships and five service managers at independent service centers that were in close geographic proximity to the researcher but not included in the sample. The pilot participants were randomly selected from independent service centers and dealerships throughout the Roanoke, Virginia area. The pilot service managers provided feedback about the questions posed, along with any difficulties they had with the items. Revisions were made and the corrected survey was distributed to the selected sample participants.

Survey Distribution to Virginia Automobile Service Mangers

The survey was distributed to selected Virginia service managers in both dealerships and independent service centers through the use of the Virginia Tech survey system available on the internet (<https://survey.vt.edu/survey/viewResults.jsp?id=1153320518887>) and through a paper version of the survey. Throughout the survey process, participants were given the choice of completing the survey online or on paper and sending it back in the self-addressed envelope. A letter (Appendix A) was sent to each selected participant explaining the study, providing the assurances of confidentiality, and directing them to the paper survey

or website where they could complete the survey. Two weeks were allowed for the participant to complete the survey. Participants not completing the survey within the two week time period were sent a different letter (Appendix A) with a second paper version of the survey along with directions to complete the online survey. Two weeks were given to complete the survey either using the paper or the online version. After that, reminder calls were made to the service managers asking them to complete the survey either online or through the paper survey.

Data Analysis

Development of Constructs

Ary, Jacobs & Razavieh (1996, p. 28) explain that constructs are “used to summarize observations and provide explanations.” The survey questions in this study focused around the research question (see Table 3.1). The first set of questions (1-10) focused on the subset question: Does the ASE certification provide benefits to the employers? The second set of questions (11-20) focused on the subset question: Do the employers see a benefit of ASE certification to the technicians as compared to those without credentials? In addition, the data collected allow for the analysis of the differences between the perceptions of automotive service managers of dealerships versus automotive service managers of independent auto servicing centers.

Table 3.1

Development of Constructs with Survey Questions

Research Question	Question #	Corresponding Survey Question
(1) Does the ASE certification provide benefits to the employers?	1	ASE certification is an appropriate indicator of competence within any service area (for example, ASE test for brakes competence or ASE test for suspensions competence, etc.).
	2	ASE certified technicians are more productive than non-certified technicians.
	3	ASE certified technicians require less supervision than non-certified technicians.
	4	ASE certified technicians require less on-the-job training than non-certified technicians.
	5	ASE certified technicians make the company more money over someone non-certified.
	6	My company encourages ASE certification of our employees.
	7	Most of our automotive technicians are certified in at least one ASE area.
	8	ASE certification attainment assists my employees in keeping up with automotive industry trends.
	9	ASE certified technicians perform higher level duty assignments than non-certified employees.
	10	ASE certification helps our customers feel more confident about the quality of work being done on their automobile.
(2) Do the employers see a benefit of ASE certification to the technician as compared to those without the certification?	11	My business pays ASE certification holders more than those without the ASE certification.
	12	My company pays the expenses associated with gaining ASE certification of our employees.
	13	ASE certification should be required for all technicians.
	14	Individuals with ASE certifications are typically more highly sought after by employers than those without the certifications.
	15	All other qualifications being equal, I would hire a non-certified candidate over an ASE certified candidate.
	16	Technicians with ASE certifications are better prepared than technicians without the certification.
	17	All other qualifications being equal, I would hire a recent high school ASE certified candidate over an older non certified candidate.
	18	ASE certifications are an important part of a technician's employment portfolio.
	19	Technicians with ASE certification(s) are held in a higher regard by other technicians for their ASE accomplishment(s).
	20	ASE certified technicians are more confident in the work they do.

Independent Samples t Test

Unweighted composite means of the responses from both the dealership and independent service center managers were determined and analyzed using an *independent samples t* test. A *t* test is “a statistical procedure for testing hypotheses concerning the difference between two means” (Ary, Jacobs & Razavieh, 1996, pg. 576). The groups of service managers at dealerships and independent service centers are considered independent because they are selected independently from the population without any other relationship between the two groups. It is hypothesized that the two groups’ perceptions of ASE certification benefits are significantly ($p < .05$) different from each other.

The unweighted composite mean score for both benefits to the employer and benefits to the technician was calculated by averaging the responses for each participant and then averaging the mean of the responses. Microsoft Excel was used to calculate the mean for each participant and SPSS was used to calculate the unweighted composite mean score and standard deviation.

Summary

This study is conducted through the use of a survey sent to automobile service managers in both dealerships and independent service centers. The purpose of this study is to determine whether there are benefits to obtaining ASE certification for both the company and the technician. Independent samples *t* tests were performed to determine whether there were significant differences between the responses of the dealership and independent service managers. Results are displayed in tables that include descriptive statistics and frequencies.

CHAPTER FOUR

Findings of the Study

This chapter will describe the findings of the study and will determine if there is a benefit to ASE certification as perceived by automotive service managers. Descriptive analyses for the study are presented.

Profile of the Sample

The data were obtained by using a survey that asked demographic information as well as questions that answered the research question: Is there a perceived benefit of ASE certification? In addition, the two subset questions were explored. The first sub question is (1) Does the ASE certification provide benefits to the employers? And second, (2) do the employers see a benefit of ASE certification to the technician as compared to those without credentials? Of the 260 surveys distributed only 249 were successfully received. Four dealership and 7 independent service manager surveys were not used because one was mistakenly included in the pilot study and the others were undeliverable or the company was out of business. One hundred seventy-eight returned surveys produced a response rate of 71%. One survey was received after the deadline and after the scores had already been calculated, therefore that survey was not counted. The dealership service manager survey population was 126 and the independent service manager survey population was 123. The dealership service managers returned 102 surveys representing 81%. The independent service managers returned 76 surveys representing 62%. One hundred sixty-nine service managers were male and 9 were female. Additional information regarding the demographics of the participants can be found in Appendix D.

Procedures

The Institutional Review Board at Virginia Tech gave the appropriate permission to conduct the study (see Appendix C). A sample of 130 dealership service managers was selected at random from the 2006 Virginia Automobile Dealer Association (VADA) Membership Directory. The VADA has 602 franchised dealerships within the Commonwealth of Virginia. The sample for the study polled 22% of the entire membership. A sample of 130 independent service managers was selected by matching the zip codes of selected dealerships with an internet phone directory search. Each dealership service manager was matched with an independent service manager within the same zip code. See Table 4.1 for a table of the sample profile.

The first round of surveys was sent by the U.S. Postal Service and included a letter describing the survey and a self-addressed stamped envelope to return the survey. The service managers were given two weeks to answer the survey. The first round resulted in 78 surveys returned. The dealership service managers returned 57 surveys while the independent service managers returned only 21. The second round of surveys was also sent by the U.S. Mail and included a letter and addressed return envelope. Two weeks were given to complete the survey. The second round resulted in 43 surveys returned. The dealership service managers returned 27 surveys while the independent service managers returned only 16. The third round of surveys was prompted by telephone calls. As many as five telephone calls were made to each service manager over a three month period. The third round resulted in 57 surveys returned. The dealership service managers returned 18 surveys while the independent service managers returned 39. Throughout the entire survey process participants were given the option of

Table 4.1

Profile of the Sample

Service Manager Population (n = 260)	<u>n</u>	%
Dealership Service Managers		
VADA Membership	602	100
Selected Sample of Dealership Service Managers	130	22
Independent Service Managers	130	unknown
Adjustments to Population (n = 249)	<u>n</u>	%
Dealership Service Managers		
Undeliverable, Out of Business or Mistake	4	3
Independent Service Managers	123	95
Undeliverable or Out of Business	7	5
Surveys Returned	<u>n</u>	%
Total Returned		
Total Returned	178	71
Service Managers at Dealerships	102	81
Service Mangers at Independent Service Centers	76	62
Returned by Rounds		
Round 1 – survey, letter and online directions		
Dealership Service Managers	57	45
Independent Service Managers	21	17
Round 2 – survey, 2nd letter and online directions		
Dealership Service Managers	27	21

(Table 4.1 continues)

(Table 4.1 continues)

	<u>n</u>	%
Independent Service Managers	16	13
Round 3 – prompting by telephone calls	57	23
Dealership Service Managers	18	14
Independent Service Managers	39	32
Completed Using VT Online Survey Site	34	14

completing the survey online through the Virginia Tech survey site (<https://survey.vt.edu/survey/viewResults.jsp?id=1153320518887>). Thirty-four surveys were completed using the online method. An additional survey was completed using the online method after the deadline and was not counted.

Scores were tabulated using SPSS and Microsoft Excel. The original data were maintained in Microsoft Excel and copied to SPSS as necessary for calculations. SPSS was used to conduct independent samples *t* tests regarding the differences between the unweighted composite mean scores of dealership service managers and independent service managers regarding both employer and technician benefits. Microsoft Excel was used to tally the numbers of service managers and how they marked each question.

Results of the Factor Analysis

Exploratory Factor Analysis using Principal Components analysis with a Varimax rotation solution was conducted to determine whether the survey questions loaded on the same factor. For survey questions 1-10 (benefits to the employer), there were likely two factors present. Questions 6, 7, and 10 did not load above a .50 or higher and were removed from the calculation of the unweighted composite mean. Questions 1-5, 8 & 9 were likely measuring the same construct and could be concluded as the composite.

For survey questions 11-20 (benefits to the technician), there were likely two factors present. Questions 12 and 15 did not load above a .50 or higher and were removed from the calculation of the unweighted composite mean. Questions 11, 13, 14, 16-20 were likely measuring the same construct and could be concluded as the composite. See Appendix E for an individual question analysis.

Results of the t tests on Dealership versus Independent Service Managers

Employer Benefits

An independent samples t test was used to determine whether there was a significant difference between the unweighted composite mean scores (survey questions 1-5, 8 & 9) of the dealership service managers versus the independent service managers as it related to ASE certification benefits to the employer. There was a significant difference for type of service manager, $t(170) = 1.28, p < .05$, with dealership service managers receiving higher scores than independent service managers. This result supports the research hypothesis that there is a significant difference between the perceptions of the two groups of service managers. Dealership service managers had a mean score of 2.66 ($SD = .74$) indicating agreement that ASE certification does provide benefits to the employers. Independent service managers had a mean score of 2.53 ($SD = .66$) indicating agreement that ASE certification does provide benefits to the employers, albeit less than the agreement indicated by the dealership service managers. Specific means and frequencies are indicated for each question relating to benefits to the employer in Tables 4.2 through 4.11, respectively.

Technician Benefits

An independent samples t test was used to determine whether there was a significant difference between the unweighted composite mean scores (survey questions 11, 13, 14, 16-20) of the dealership service managers versus the independent service managers as it related to benefits to the technician. There was a significant difference for type of service manager, $t(169) = 1.44, p < .05$, with dealership service managers receiving higher scores than independent service managers. This result supports the

research hypothesis that there is a significant difference between the perceptions of the two groups of service managers. Dealership service managers had a mean score of 2.81 ($SD = .68$) indicating agreement that ASE certification does provide benefits to the technicians. Independent service managers had a mean score of 2.67 ($SD = .61$) indicating agreement that ASE certification does provide benefits to the technicians, albeit less than the agreement indicated by the dealership service managers. Specific means and frequencies are indicated for each question relating to ASE certification benefits to the technician in Tables 4.12 through 4.21, respectively.

Analyses of Individual Questions

In Tables 4.2 through 4.11 descriptive analyses is provided for survey questions supporting the first subset research question: Does the ASE certification provide benefits to the employers? In Tables 4.12-4.21 descriptive analysis is provided for survey questions supporting the second sub research question: Do the employers see a benefit of ASE certification to the technician as compared to those without credentials?

Following each table is a descriptive analysis of each question relating to the general agreement or disagreement of each question as perceived by the dealership service manager and independent service manager. The categories of *Strongly Disagree* and *Disagree* were combined and *Agree* and *Strongly Agree* were combined to discuss general disagreement or agreement with each question.

As noted in Table 4.2, a majority of both the dealership service managers (73%) ($n = 74$, $M = 2.84$, $SD = .91$) and the independent service managers (60%) ($n = 46$, $M = 2.70$, $SD = .88$) agreed with the statement that “ASE certification is an appropriate indicator of competence within any service area (for example, ASE test for brakes

competence or ASE test for suspensions competence, etc.).” More service managers agreed that ASE certification is an appropriate indicator that its recipient had gained competency or mastery within a specific tested area. Dealership service managers were more likely to agree with the statement than their independent service manager counterparts.

Table 4.2

Descriptive Analysis of Responses to the Automotive Service Excellence (ASE) Benefits Survey (n=178): ASE certification is an appropriate indicator of competence within any service area (for example, ASE test for brakes competence or ASE test for suspensions competence, etc.).

Survey Question	Strongly Disagree	Disagree	Agree	Strongly Agree	No Answer/ Not Applic.	Total	\bar{x}	SD
ASE certification is an appropriate indicator of competence within any service area (for example, ASE test for brakes competence or ASE test for suspensions competence, etc.).								
Dealership Service Manager	12 (12%)	15 (15%)	51 (50%)	23 (23%)	1 (1%)	102	2.84	.91
Independent Service Manager	7 (9%)	23 (30%)	32 (42%)	14 (18%)		76	2.70	.88

As noted in Table 4.3, both the automotive service managers groups were virtually split on their responses to the statement that “ASE certified technicians are more productive than non-certified technicians.” Only slightly more than half (52%) of the dealership service managers ($n = 53$, $M = 2.58$, $SD = .92$) agreed with the statement while only 35% of the independent service managers ($n = 26$, $M = 2.34$, $SD = .86$) agreed. On the disagreement side, more (59%) of the independent service managers ($n = 45$, $M = 2.34$, $SD = .86$) and almost half (48%) of the dealership service managers ($n = 49$, $M = 2.58$, $SD = .92$) disagreed with the statement. Therefore, a small majority of dealership service managers agree with the statement, while a larger majority of the independent service managers disagreed that ASE technicians are more productive than non-certified technicians.

Table 4.3

Descriptive Analysis of Responses to the Automotive Service Excellence (ASE) Benefits Survey (n=178): ASE certified technicians are more productive than non-certified technicians.

Survey Question	Strongly Disagree	Disagree	Agree	Strongly Agree	No Answer/ Not Applic.	Total	\bar{x}	SD
ASE certified technicians are more productive than non-certified technicians.								
Dealership Service Manager	12 (12%)	37 (36%)	35 (34%)	18 (18%)		102	2.58	.92
Independent Service Manager	10 (13%)	35 (46%)	18 (24%)	8 (11%)	5 (7%)	76	2.34	.86

As noted in Table 4.4, both groups of automotive service managers were practically split on the statement that “ASE certified technicians require less supervision than non-certified technicians.” Only slightly more than half (52%) of the dealership service managers ($n = 53$, $M = 2.57$, $SD = .89$) agreed with the statement while only 40% of the independent service managers ($n = 31$, $M = 2.51$, $SD = .84$) agreed. On the disagreement side, more (56%) of the independent service managers ($n = 42$, $M = 2.51$, $SD = .84$) and almost half (47%) of the dealership service managers ($n = 48$, $M = 2.57$, $SD = .89$) disagreed with the statement. To clarify, the dealership service managers somewhat agreed and the independent service managers disagreed that ASE technicians require less supervision than non-certified technicians.

Table 4.4

Descriptive Analysis of Responses to the Automotive Service Excellence (ASE) Benefits Survey (n=178): ASE certified technicians require less supervision than non-certified technicians.

Survey Question	Strongly Disagree	Disagree	Agree	Strongly Agree	No Answer/ Not Applic.	Total	\bar{x}	SD
ASE certified technicians require less supervision than non-certified technicians.								
Dealership Service Manager	11 (11%)	37 (36%)	37 (36%)	16 (16%)	1 (1%)	102	2.57	.89
Independent Service Manager	5 (7%)	37 (49%)	20 (26%)	11 (14%)	3 (4%)	76	2.51	.84

As noted in Table 4.5, both dealership and independent service managers were virtually split on the statement “ASE certified technicians require less on-the-job training than non-certified technicians.” Slightly more than half (55%) of the dealership service managers ($n = 56$, $M = 2.61$, $SD = .89$) agreed with the statement while only 42% of the independent service managers ($n = 32$, $M = 2.52$, $SD = .79$) agreed with the statement. On the disagreement side, more (51%) of the independent service managers ($n = 42$, $M = 2.52$, $SD = .79$) and a strong number (44%) of the dealership service managers ($n = 45$, $M = 2.61$, $SD = .89$) disagreed with the statement. In other words, a small majority of the dealership service managers agreed and a small majority of the independent service managers disagreed that ASE technicians require less on the job training than non-certified technicians.

Table 4.5

Descriptive Analysis of Responses to the Automotive Service Excellence (ASE) Benefits Survey (n=178) ASE certified technicians require less on-the-job training than non-certified technicians.

Survey Question	Strongly Disagree	Disagree	Agree	Strongly Agree	No Answer/ Not Applic.	Total	\bar{x}	SD
ASE certified technicians require less on-the-job training than non-certified technicians.								
Dealership Service Manager	11 (11%)	34 (33%)	39 (38%)	17 (17%)	1 (1%)	102	2.61	.89
Independent Service Manager	4 (5%)	35 (46%)	23 (30%)	9 (12%)	5 (7%)	76	2.52	.79

As noted in Table 4.6, a majority of both dealership service managers (54%) ($n = 55$, $M = 2.48$, $SD = .88$) and independent service managers (60%) ($n = 45$, $M = 2.34$, $SD = .81$) disagree with the statement that “ASE certified technicians make the company more money over someone non-certified.” In essence, service managers in both groups feel that an ASE certified technician does not make the company more money above someone non-certified. Independent service managers were more likely to disagree with the statement than their dealership counterparts.

Table 4.6

Descriptive Analysis of Responses to the Automotive Service Excellence (ASE) Benefits Survey (n=178) ASE certified technicians make the company more money over someone non-certified.

Survey Question	Strongly Disagree	Disagree	Agree	Strongly Agree	No Answer/ Not Applic.	Total	\bar{x}	SD
ASE certified technicians make the company more money over someone non-certified.								
Dealership Service Manager	12 (12%)	43 (42%)	32 (31%)	14 (14%)	1 (1%)	102	2.48	.88
Independent Service Manager	8 (11%)	37 (49%)	18 (24%)	7 (9%)	6 (8%)	76	2.34	.81

As noted in Table 4.7, a large majority (89%) of dealership service managers ($n = 91$, $M = 3.44$, $SD = .72$) and a majority (61%) of independent service managers ($n = 46$, $M = 2.86$, $SD = .90$) agreed with the statement that “my company encourages ASE certification of our employees.” To clarify, more service managers in both groups agreed that they encourage their employees to gain ASE certification. Dealership service managers were more likely to agree with the statement than their independent counterparts.

Table 4.7

Descriptive Analysis of Responses to the Automotive Service Excellence (ASE) Benefits Survey (n=178) My company encourages ASE certification of our employees.

Survey Question	Strongly Disagree	Disagree	Agree	Strongly Agree	No Answer/ Not Applic.	Total	\bar{x}	SD
My company encourages ASE certification of our employees.								
Dealership Service Manager	3 (3%)	4 (4%)	38 (37%)	53 (52%)	4 (4%)	102	3.44	.72
Independent Service Manager	4 (5%)	23 (30%)	25 (33%)	21 (28%)	3 (4%)	76	2.86	.90

As noted in Table 4.8, a majority of both dealership service managers (83%) ($n = 85$, $M = 3.32$, $SD = .78$) and independent service managers (62%) ($n = 47$, $M = 2.85$, $SD = .92$) agreed with the statement that “most of our automotive technicians are certified in at least one ASE area.” Therefore, more service managers agreed that most of their employees were certified in at least one ASE area. Dealership service managers were more likely to agree with the statement than their independent counterparts.

Table 4.8

Descriptive Analysis of Responses to the Automotive Service Excellence (ASE) Benefits Survey (n=178) Most of our automotive technicians are certified in at least one ASE area.

Survey Question	Strongly Disagree	Disagree	Agree	Strongly Agree	No Answer/ Not Applic.	Total	\bar{x}	SD
Most of our automotive technicians are certified in at least one ASE area.								
Dealership Service Manager	3 (3%)	10 (10%)	38 (37%)	47 (46%)	4 (4%)	102	3.32	.78
Independent Service Manager	6 (8%)	18 (24%)	28 (37%)	19 (25%)	5 (7%)	76	2.85	.92

As noted in Table 4.9, a majority of both dealership service managers (69%) ($n = 70$, $M = 2.86$, $SD = .88$) and independent service managers (55%) ($n = 42$, $M = 2.76$, $SD = .76$) agreed with the statement that “ASE certification attainment assists my employees in keeping up with automotive industry trends.” Therefore, both groups of service managers agreed that the certification helps their employees keep up-to-date with automotive trends. Dealership service managers were more likely to agree with the statement than their independent counterparts.

Table 4.9

Descriptive Analysis of Responses to the Automotive Service Excellence (ASE) Benefits Survey (n=178): ASE certification attainment assists my employees in keeping up with automotive industry trends.

Survey Question	Strongly Disagree	Disagree	Agree	Strongly Agree	No Answer/ Not Applic.	Total	\bar{x}	SD
ASE certification attainment assists my employees								
in keeping up with automotive industry trends.								
Dealership Service Manager	8 (8%)	22 (22%)	46 (45%)	24 (24%)	2 (2%)	102	2.86	.88
Independent Service Manager	2 (3%)	23 (30%)	31 (41%)	11 (14%)	9 (12%)	76	2.76	.76

As noted in Table 4.10, the dealership service managers agreed with the statement that “ASE certified technicians perform higher level duty assignments than non-certified employees,” while the independent service managers disagreed. Sixty percent of the dealership service managers ($n = 61$, $M = 2.68$, $SD = .86$) agreed with the statement while only 32% of the independent service managers ($n = 32$, $M = 2.52$, $SD = .80$) agreed with the statement. Conversely, a majority (54%) of the independent service managers ($n = 41$, $M = 2.52$, $SD = .80$) disagreed while only 39% of the dealership service managers ($n = 40$, $M = 2.68$, $SD = .86$) disagreed with the statement.

Table 4.10

Descriptive Analysis of Responses to the Automotive Service Excellence (ASE) Benefits Survey (n=178): ASE certified technicians perform higher level duty assignments than non-certified employees.

Survey Question	Strongly Disagree	Disagree	Agree	Strongly Agree	No Answer/ Not Applic.	Total	\bar{x}	SD
ASE certified technicians perform higher level duty assignments than non-certified employees.								
Dealership Service Manager	9 (9%)	31 (30%)	44 (43%)	17 (17%)	1 (1%)	102	2.68	.86
Independent Service Manager	4 (5%)	37 (49%)	22 (29%)	10 (13%)	3 (4%)	76	2.52	.80

As noted in Table 4.11, a strong majority of both dealership service managers (72%) ($n = 74$, $M = 3.01$, $SD = .90$) and independent service managers (70%) ($n = 53$, $M = 3.03$, $SD = .86$) agreed with the statement that “ASE certification helps our customers feel more confident about the quality of work being done on their automobile.” Fundamentally, the two groups of service managers strongly agreed that the certification helps their customers’ confidence level in workmanship.

Table 4.11

Descriptive Analysis of Responses to the Automotive Service Excellence (ASE) Benefits Survey (n=178) ASE certification helps our customers feel more confident about the quality of work being done on their automobile.

Survey Question	Strongly Disagree	Disagree	Agree	Strongly Agree	No Answer/ Not Applic.	Total	\bar{x}	SD
ASE certification helps our customers feel more confident about the quality of work being done on their automobile.								
Dealership Service Manager	7 (7%)	18 (18%)	41 (40%)	33 (32%)	3 (3%)	102	3.01	.90
Independent Service Manager	3 (4%)	16 (21%)	29 (38%)	24 (32%)	4 (5%)	76	3.03	.86

As noted in Table 4.12, a majority (67%) of the dealership service managers ($n = 68$, $M = 2.88$, $SD = .87$) agreed with the statement “My business pays ASE certification holders more than those without the ASE certification,” while only 39% of the independent service managers ($n = 30$, $M = 2.65$, $SD = .87$) agreed with the statement. Independent service managers either disagreed (18%) with the statement or failed to provide a response to the question ($n = 14$, $M = 2.65$, $SD = .87$). An explanation for the high number of non-respondents may be attributed to the fact that they did not have any ASE certified technicians. Therefore, they would not pay them more. Respondents either marked “not applicable” or did not answer the question. Thus, the dealership service managers pay their technicians with ASE certification more and the independent service managers either do not pay more or do not have ASE certified technicians.

Table 4.12

Descriptive Analysis of Responses to the Automotive Service Excellence (ASE) Benefits Survey (n=178): My business pays ASE certification holders more than those without the ASE certification.

Survey Question	Strongly Disagree	Disagree	Agree	Strongly Agree	No Answer/ Not Applic.	Total	\bar{x}	SD
My business pays ASE certification holders more than those without the ASE certification.								
Dealership Service Manager	7 (7%)	22 (22%)	44 (43%)	24 (24%)	5 (5%)	102	2.88	.87
Independent Service Manager	3 (4%)	29 (38%)	17 (22%)	13 (17%)	14 (18%)	76	2.65	.87

As noted in Table 4.13, a majority of both dealership service managers (82%) ($n = 84$, $M = 3.32$, $SD = .80$) and independent service managers (55%) ($n = 42$, $M = 2.91$, $SD = .92$) agreed with the statement that “My company pays the expenses associated with gaining ASE certification of our employees.” Basically, dealership service managers strongly agreed that their company pays the expenses related to gaining certification while independent service managers marginally agreed that they paid the expenses.

Table 4.13

Descriptive Analysis of Responses to the Automotive Service Excellence (ASE) Benefits Survey (n=178): My company pays the expenses associated with gaining ASE certification of our employees.

Survey Question	Strongly Disagree	Disagree	Agree	Strongly Agree	No Answer/ Not Applic.	Total	\bar{x}	SD
My company pays the expenses associated with gaining ASE certification of our employees.								
Dealership Service Manager	4 (4%)	8 (8%)	37 (36%)	47 (46%)	6 (6%)	102	3.32	.80
Independent Service Manager	4 (5%)	18 (24%)	22 (29%)	20 (26%)	12 (16%)	76	2.91	.92

As noted in Table 4.14, the dealership service managers agreed and the independent service managers disagreed that “ASE certification should be required for all technicians.” Slightly more than half (54%) of the dealership service managers ($n = 55$, $M = 2.72$, $SD = .92$) agreed with the statement while only 43% of the independent service managers ($n = 33$, $M = 2.51$, $SD = .99$) agreed with the statement. On the disagreement side, more (55%) of the independent service managers ($n = 42$, $M = 2.51$, $SD = .99$) and a many (41%) of the dealership service managers ($n = 42$, $M = 2.61$, $SD = .89$) disagreed with the statement.

Table 4.14

Descriptive Analysis of Responses to the Automotive Service Excellence (ASE) Benefits Survey (n=178): ASE certification should be required for all technicians.

Survey Question	Strongly Disagree	Disagree	Agree	Strongly Agree	No Answer/ Not Applic.	Total	\bar{x}	SD
ASE certification should be required for all technicians.								
Dealership Service Manager	8 (8%)	34 (33%)	32 (31%)	23 (23%)	5 (5%)	102	2.72	.92
Independent Service Manager	11 (14%)	31 (41%)	17 (22%)	16 (21%)	1 (1%)	76	2.51	.99

As noted in Table 4.15, a majority of both dealership service managers (76%) ($n = 78$, $M = 3.05$, $SD = .83$) and independent service managers (79%) ($n = 60$, $M = 3.03$, $SD = .68$) agreed with the statement that “individuals with ASE certifications are typically more highly sought after by employers than those without the certifications.” Essentially, both groups of service managers strongly agreed that technicians with certifications are more sought after by repair facilities than those without the certification.

Table 4.15

Descriptive Analysis of Responses to the Automotive Service Excellence (ASE) Benefits Survey (n=178): Individuals with ASE certifications are typically more highly sought after by employers than those without the certifications.

Survey Question	Strongly Disagree	Disagree	Agree	Strongly Agree	No Answer/ Not Applic.	Total	\bar{x}	SD
Individuals with ASE certifications are typically more highly sought after by employers than those without the certifications.								
Dealership Service Manager	5 (5%)	16 (16%)	47 (46%)	31 (30%)	3 (3%)	102	3.05	.83
Independent Service Manager	1 (1%)	13 (17%)	43 (57%)	17 (22%)	2 (3%)	76	3.03	.68

As noted in Table 4.16, a majority of both dealership service managers (73%) ($n = 74$, $M = 2.92$, $SD = .75$) and independent service managers (69%) ($n = 52$, $M = 2.76$, $SD = .66$) agreed with the statement that “All other qualifications being equal, I would hire an ASE certified candidate over a non-certified candidate.” In essence, both dealership and independent service managers agreed that they would hire an ASE certified candidate over someone non-certified.

This question was originally and deliberately posed on the survey in a reversed and negative form stating “All other qualifications being equal, I would hire a non-certified candidate over an ASE certified candidate.” Best & Kahn (1993) state that weights for negative or unfavorable stated items should be reversed. Their research finds that disagreement with an unfavorable statement is psychologically the same as agreement with a favorable statement.

Table 4.16

Descriptive Analysis of Responses to the Automotive Service Excellence (ASE) Benefits Survey (n=178): All other qualifications being equal, I would hire an ASE certified candidate over a non-certified candidate.

Survey Question	Strongly Disagree	Disagree	Agree	Strongly Agree	No Answer/ Not Applic.	Total	\bar{x}	SD
All other qualifications being equal, I would hire an ASE certified candidate over a non-certified candidate.								
Note: This question in its original form on the survey was reversed. It was stated, "All other qualifications being equal, I would hire a non-certified candidate over an ASE certified candidate."								
Dealership Service Manager	4 (4%)	19 (19%)	55 (54%)	19 (19%)	5 (5%)	102	2.92	.75
Independent Service Manager	3 (4%)	17 (22%)	46 (61%)	6 (8%)	4 (5%)	76	2.76	.66

As noted in Table 4.17, the dealership and independent service managers were virtually split regarding the statement that “technicians with ASE certifications are better prepared than technicians without the certification” Sixty percent of the dealership service managers ($n = 61$, $M = 2.67$, $SD = .80$) agreed with the statement while only 41% of the independent service managers ($n = 31$, $M = 2.47$, $SD = .71$) agreed with the statement. Conversely, more (55%) of the independent service managers ($n = 42$, $M = 2.47$, $SD = .71$) than dealership service managers (39%) ($n = 40$, $M = 2.67$, $SD = .80$) disagreed with the statement. In other words, more of the dealership service managers agreed and more of the independent service managers disagreed that technicians with ASE certifications are better prepared than technicians without the certification.

Table 4.17

Descriptive Analysis of Responses to the Automotive Service Excellence (ASE) Benefits Survey (n=178): Technicians with ASE certifications are better prepared than technicians without the certification.

Survey Question	Strongly Disagree	Disagree	Agree	Strongly Agree	No Answer/ Not Applic.	Total	\bar{x}	SD
Technicians with ASE certifications are better prepared than technicians without the certification.								
Dealership Service Manager	7 (7%)	33 (32%)	47 (46%)	14 (14%)	1 (1%)	102	2.67	.80
Independent Service Manager	3 (4%)	39 (51%)	25 (33%)	6 (8%)	3 (4%)	76	2.47	.71

As noted in Table 4.18, a majority of both dealership service managers (51%) ($n = 52$, $M = 2.52$, $SD = .89$) and independent service managers (68%) ($n = 51$, $M = 2.26$, $SD = .72$) disagreed with the statement that “All other qualifications being equal, I would hire a recent high school ASE certified candidate over an older non certified candidate.” Fundamentally, both dealership and independent service managers felt that the age of the candidate outweighed the ASE certification as a selection criterion.

Table 4.18

Descriptive Analysis of Responses to the Automotive Service Excellence (ASE) Benefits Survey (n=178): All other qualifications being equal, I would hire a recent high school ASE certified candidate over an older non certified candidate.

Survey Question	Strongly Disagree	Disagree	Agree	Strongly Agree	No Answer/ Not Applic.	Total	\bar{x}	SD
All other qualifications being equal, I would hire a recent high school ASE certified candidate over an older non certified candidate.								
Dealership Service Manager	10 (10%)	42 (41%)	28 (27%)	16 (16%)	6 (6%)	102	2.52	.89
Independent Service Manager	8 (11%)	43 (57%)	19 (25%)	4 (5%)	2 (3%)	76	2.26	.72

As noted in Table 4.19, a strong majority of both dealership service managers (79%) ($n = 81$, $M = 3.14$, $SD = .86$) and independent service managers (81%) ($n = 61$, $M = 3.01$, $SD = .74$) agreed with the statement that “ASE certifications are an important part of a technician’s employment portfolio.” To clarify, more service managers agreed that technicians should have ASE certifications when they are looking for a job. It was noteworthy that the independent service managers felt stronger about this than their dealership service manager counterparts.

Table 4.19

Descriptive Analysis of Responses to the Automotive Service Excellence (ASE) Benefits Survey (n=178): ASE certifications are an important part of a technician's employment portfolio.

Survey Question	Strongly Disagree	Disagree	Agree	Strongly Agree	No Answer/ Not Applic.	Total	\bar{x}	SD
ASE certifications are an important part of a technician's employment portfolio.								
Dealership Service Manager	6 (6%)	12 (12%)	43 (42%)	38 (37%)	3 (3%)	102	3.14	.86
Independent Service Manager	3 (4%)	11 (14%)	43 (57%)	18 (24%)	1 (1%)	76	3.01	.74

As noted in Table 4.20, a majority of both dealership service managers (64%) ($n = 65$, $M = 2.80$, $SD = .85$) and independent service managers (67%) ($n = 51$, $M = 2.83$, $SD = .81$) agreed with the statement that “technicians with ASE certification(s) are held in a higher regard by other technicians for their ASE accomplishment(s).” Essentially, both groups of service managers agreed that ASE technicians are held in higher esteem by their peers.

Table 4.20

Descriptive Analysis of Responses to the Automotive Service Excellence (ASE) Benefits Survey (n=178): Technicians with ASE certification(s) are held in a higher regard by other technicians for their ASE accomplishment(s).

Survey Question	Strongly Disagree	Disagree	Agree	Strongly Agree	No Answer/ Not Applic.	Total	\bar{x}	SD
Technicians with ASE certification(s) are held in a higher regard by other technicians for their ASE accomplishment(s).								
Dealership Service Manager	7 (7%)	26 (25%)	45 (44%)	20 (20%)	4 (4%)	102	2.80	.85
Independent Service Manager	4 (5%)	20 (26%)	36 (47%)	15 (20%)	1 (1%)	76	2.83	.81

As noted in Table 4.21, a majority of both dealership service managers (56%) ($n = 57$, $M = 2.68$, $SD = .84$) and independent service managers (54%) ($n = 41$, $M = 2.70$, $SD = .80$) agreed with the statement that “ASE certified technicians are more confident in the work they do.” Basically, both groups of service managers agreed ASE certified technicians are more confident in their work.

Table 4.21

Descriptive Analysis of Responses to the Automotive Service Excellence (ASE) Benefits Survey (n=178): ASE certified technicians are more confident in the work they do.

Survey Question	Strongly Disagree	Disagree	Agree	Strongly Agree	No Answer/ Not Applic.	Total	\bar{x}	SD
ASE certified technicians are more confident in the work they do.								
Dealership Service Manager	7 (7%)	34 (33%)	40 (39%)	17 (17%)	4 (4%)	102	2.68	.84
Independent Service Manager	3 (4%)	27 (36%)	29 (38%)	12 (16%)	5 (7%)	76	2.70	.80

Summary

Chapter Four reported the perceptions of automotive service managers toward the benefits of ASE certification for both the company and to the technician. A *t* test determined that there was a significant difference in how the dealership service managers and independent service managers scored on the survey in relation to the benefits of ASE certification for the employer. Although the two groups' scores were significantly different, the unweighted composite mean score and specific frequencies of the survey responses indicated general agreement that ASE certification does provide benefits to the employer. Another *t* test determined that there was a significant difference in how the dealership service managers and independent service managers scored on the survey in relation to the benefits of ASE certification for the technician. Although the two groups' scores were significantly different, the unweighted composite mean score and specific frequencies of the survey responses indicated general agreement that ASE certification does provide benefits to the technician. A summary, discussion, areas of further study, and implications of this study follow in Chapter Five.

CHAPTER FIVE

Summary, Conclusions, Discussion, and Recommendations

The purpose of this study was to determine if there is a benefit to ASE certification as perceived by automotive service managers. The word *benefit* or *benefits* refer to something that enhances well-being, provides an advantage, or provides payment in accordance with a wage. This chapter provides a summary of the procedures used, findings, conclusions, and recommendations for further study.

Procedure Summary

A sample of 130 dealership service managers was selected at random from the 2006 Virginia Automobile Dealer Association (VADA) Membership Directory. The VADA has 602 franchised dealerships within the Commonwealth of Virginia. The sample for the study polled 22% of the entire membership. A corresponding sample of 130 independent service managers was selected by matching the zip codes of chosen dealerships with an internet phone directory search. Each dealership service manager was matched with an independent service manager within the same zip code. Four dealership and seven independent service manager surveys were not used because one was mistakenly included in the pilot study and the others were undeliverable or the company was out of business. The survey population of the dealership service managers was 126 and independent service managers was 123. The dealership service managers returned 102 surveys representing 81%. The independent service managers returned 76 surveys representing 62%. There was a 71% overall return rate.

Scores were tabulated and an independent samples *t* test was conducted regarding the difference between the unweighted composite mean scores of dealership service

managers and independent service managers for both the employer (survey questions 1-5, 8 & 9) and again for the technician (survey questions 11, 13, 14, 16-20). A descriptive analysis of each survey question was conducted to include frequencies and mean scores with standard deviations for each group and a summary of each question.

Summary of Findings, Conclusions, and Discussion of Results

This section focuses on the summary of the findings as it relates to the subset research questions: (1) Does the ASE certification provide benefits to the employers? And second, (2) do the employers see a benefit of ASE certification to the technician as compared to those without credentials? In addition, a summary of the primary findings are presented. The summaries include a review of the results and discussion for each of the analyses.

Subset Research Question One: Does the ASE certification provide benefits to the employers?

Summary of Findings

An independent samples t test was used to determine whether there was a significant difference between the unweighted composite mean scores (survey questions 1-5, 8 & 9) of the dealership service managers versus the independent service managers as it related to ASE certification benefits to the employer. There was a significant difference for type of service manager polled, $t(170) = 1.28, p < .05$, with dealership service managers assigning higher scores than independent service managers. This result supports the research hypothesis that there is a significant difference between the perceptions of the two groups of service managers. Dealership service managers had a mean score of 2.66 ($SD = .74$) indicating agreement with the statement that ASE

certification does provide benefits to the employers. Independent service managers had a mean score of 2.53 ($SD = .66$) indicating only slight agreement that ASE certification provides benefits to the employers.

Conclusions

Based on the analysis of this test regarding the benefits of ASE certification to the employer, it is concluded that ASE certification does offer benefits to the employer; however, there is a significant difference between how the dealership and independent service managers responded. Dealership service managers were more likely to agree that ASE certification of their technicians benefited them than their independent counterparts.

Discussion

When examining the individual questions that comprise the composite of benefits to the employer, the dealership and independent service agreed on several questions. Eighty-nine percent of the dealership service managers and 61% of the independent service managers agree that their company encourages ASE certification of their employees, and 83% of the dealership service managers and 61% of the independent service managers agree that most of their technicians are certified in at least one ASE area. Additionally, most agree that they encouraged technicians to gain ASE certification. A majority of the service managers in both groups also indicated that ASE certification is an appropriate indicator of competence within a testing area, and that ASE certification helps their customers feel more confident about the work being done on their automobile.

A majority of both groups of service managers disagreed that ASE certification of their technicians make the company more money. The data indicates that ASE

certification has more indirect links to economic benefits rather than directly influencing profits.

However, the groups offered substantially different viewpoints on four survey questions. Fifty-two percent of the dealership service managers agreed that ASE certified technicians are more productive, while 59% of the independent service managers disagreed. They also had contrasting viewpoints about ASE certified technicians requiring less supervision and less on-the-job training, and performing higher level duty assignments. A small majority of the dealership service managers agreed with the statements, while a small majority of the independent service managers disagreed with the same statements.

A majority of the service managers in both groups agreed that ASE certification does provide benefits to their company. Dealership service managers had a mean score of 2.66 ($SD = .74$), and independent service managers had a mean score of 2.53 ($SD = .66$) indicating agreement that ASE certification does provide benefits to the employers.

Subset Research Question Two: Do the employers see a benefit of ASE certification to the technicians as compared to those without credentials?

Summary of Findings

An independent samples t test was used to determine whether there was a significant difference between the unweighted composite mean scores (survey questions 11, 13, 14, 16-20) of the dealership service managers versus the independent service managers as it related to benefits to the technician. There was a significant difference for type of service manager polled, $t(169) = 1.44, p < .05$, with dealership service managers receiving higher scores than independent service managers. This result supports the

research hypothesis that there is a significant difference between the perceptions of the two groups of service managers. Dealership service managers had a mean score of 2.81 ($SD = .68$) indicating agreement that ASE certification does provide benefits to the technicians. Independent service managers had a mean score of 2.67 ($SD = .61$) indicating agreement that ASE certification does provide benefits to the technicians, albeit to a lesser degree than indicated by the dealership service managers.

Conclusions

Based on the analysis of this test regarding the benefits of ASE certification to the technician, it is concluded that ASE certification does offer benefits to the technician as compared to those without credentials; however, there is a significant difference between how the dealership and independent service managers responded. Dealership service managers were more likely to agree that ASE certification benefited technicians.

Discussion

When examining the individual questions that make up the composite of benefits to the technician, the dealership and independent service managers agree on several questions. Eighty-two percent of the dealership service managers and 55% of the independent service managers agree that they have paid the expenses associated with their technicians obtaining ASE certification, and 79% of the independent service managers and 76% of the dealership service managers agree that technicians with ASE certification are more highly sought after by other companies than those without the certification. A majority agree that technicians with ASE certifications are held in a higher regard by their peers. They agree with a slight majority that ASE technicians are more confident in the work that they do. Approximately 80% of both groups feel that

ASE certification is an important part of the technician's employment portfolio, and approximately 70 % of both groups agree that they would hire someone ASE certified over someone without the certification.

Conversely, a majority of both groups of service managers disagreed that they would hire a recent high school graduate with ASE certification over someone older but not certified. This indicates that the service managers value chronological age over the competence indicator of passing an ASE certification exam.

The groups offered substantially different viewpoints on some survey questions. A majority of dealership service managers agreed that ASE certification should be required of all technicians while a majority of independent service managers disagreed. A majority of dealership service managers agreed that technicians with ASE certification are better prepared than non-certified technicians while a majority of independent service managers disagreed.

A majority of the service managers in both groups agreed that ASE certification does provide benefits to the technician. Dealership service managers had a mean score of 2.81 ($SD = .68$) indicating agreement that ASE certification does provide benefits to the technicians. Independent service managers had a mean score of 2.67 ($SD = .61$) indicating agreement that ASE certification does provide benefits to the technicians, albeit to a lesser degree.

Primary Research Question: Is there a perceived benefit of ASE certification?

Summary of Findings

The independent samples t tests were used to determine significant differences between the unweighted composite mean scores of the dealership service managers

versus the independent service managers. The t tests related to ASE certification benefits to the employer (survey questions 1-5, 8 & 9) and to the technician (survey questions 11, 13, 14, 16-20) indicate that there was a significant difference for type of service manager, $t(170) = 1.28, p < .05$ and $t(169) = 1.44, p < .05$, respectively. In both tests dealership service managers assigned higher scores than independent service managers.

Conclusions

Based on the analysis of this study regarding the primary benefits of ASE certification, it is concluded that ASE certification does offer benefits; however, there is a significant difference between how the dealership and independent service managers responded. Dealership service managers were more likely to agree that ASE certification offers benefits than independent service managers.

Discussion

When examining the individual questions that comprise the composite of benefits to the employer and to the technician, the dealership and independent service managers had a majority agreement on 11 of 20 questions that were indicators of benefit.

Both groups of service managers had a majority of disagreement on only 2 of 20 benefit indicators. A majority do not agree that ASE technicians make the company more money over someone non-certified. In addition, both groups of service managers indicated that they would not hire a recent high school ASE certified technician over someone older and not-certified.

The groups offered substantially different viewpoints on 7 of 20 benefit indicator survey questions. They differed on ASE certified technician productivity, supervision requirements, on-the-job training requirements, and performance of higher level duty

assignments. They also differed on whether or not they pay ASE technicians more, whether ASE certified technicians are better prepared, and whether ASE certification should be required of all technicians. In every instance the dealership service manager agreed and the independent service manager disagreed.

Recommendations

The following are suggestions for further research and changes to practice and policy. These suggestions are based upon the researcher's opinions regarding the results of the study.

Recommendations for Further Research

1. This study examined only Virginia automotive service managers. Since ASE is a nationwide testing program, a nationwide study should be conducted of automotive service managers to determine the nationwide results.
2. Much of the research regarding benefits of certifications and credentials is determined by analyzing the difference in pay for the credential. This study does not look specifically at the amount of increased earnings for holding an ASE certification. A study should be done that determines specific amounts of pay gained by receiving an ASE certification.
3. This study examined the differences in perceptions of dealership and independent service managers. As part of the survey, service managers indicated their personal ASE certification status. The data indicates there may be a possible bias toward ASE certification depending on whether or not the service manager personally held a certification. An analysis should be done to determine if there is a bias for or against certification based on personal certification holding status.

4. This study examined the benefits of ASE certification from the perceptions of the service manager. This study does not take into account the views of the actual technician. A study should be conducted of technicians in both dealerships and independent service centers asking the same questions posed in this study. An analysis of the results would add to the understanding of the benefits of ASE certification.
5. ASE certification is one of the largest and most organized industry certification programs being used by Career and Technical Education programs to prove program competency and relevance; however, there are hundreds of other industry recognized certification programs. Other certification programs and industries should be studied to determine their benefits.

Recommendations for Practice or Policy

1. This study has determined that independent service managers are less likely to see a benefit of ASE certification as compared to the dealership service managers. ASE and school divisions should market the benefits of ASE certification to independent service managers. It is desired that through a successful public relations campaign, independent service managers would seek out and financially compensate ASE certified technicians.
2. The Virginia General Assembly has mandated that "Career and Technical education programs should be aligned with industry and professional standard certifications, where they exist" (Code of Virginia, 2005), and the Virginia Department of Education, along with other state's educational leaders, have recommended that schools use certification testing to prove competency within a

training area. It is hoped that certification will make its students more employable, and it is assumed that employers are actually utilizing certification as part of their hiring practices. However, data obtained within this study indicates only a moderate agreement that there is a benefit or utilization to the specific industry based certification ASE. Much more research should be conducted to determine if employers are actually using or recognizing certifications as indicators of competence for the employers they hire before such mandates are made. ASE certification is one of the most widely known and popular industry based certification programs. To receive only moderate agreement regarding its benefit leads this researcher to believe that other certifications would be considered even less beneficial by those less popular industries or trade areas.

Summary

The studies reviewed within Chapter Two determine benefits by analyzing the monetary gains for achieving the various certifications and credentials through the use of national data sets. This study differs from those studies because it focuses on a specific industry's perceived benefits through the viewpoint of the employer. The study of automotive service managers suggests that they do perceive benefits to gaining an automotive based certification.

This study supports the research of Grubb (1993, 1995, 1997 & 2002) and Lewis et al. (1993) who contend there are limited benefits to sub-baccalaureate credentialing. However, this study does not provide as much support for the results of Kane and Rouse (1995) and Kerckhoff and Bell (1998) who contend that there are significant gains for completion, and even partial completion, of sub-baccalaureate credentials.

This study and the studies conducted within the reviewed literature suggest that there are benefits to obtaining certifications and other forms of credentials; however, more research is needed to determine whether employers and other stakeholders (legislators, state departments of education, schools, and others) are actually relying on certifications to demonstrate competency. It is still uncertain if other industry or trade area employers are actually using the certification as a hiring measure or even if they are aware that the certification exists for their particular industry. As use of certifications and credentialing by employers is still an unsure practice, legislators and educators should apply caution when considering policy mandates to high school and postsecondary students.

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Appendix A

Cover Letters to Service Managers



Department of Educational Leadership and Policy Studies

College of Liberal Arts and Human Sciences
219 E. Eggleston Hall (0302), Blacksburg, VA 24061
(540) 231-5642 Fax: (540) 231-7845

August 15, 2006

University Exemplary Department

Automotive Service Manager

«Name»

«Street_Address»

«City», VA «Zip»

Dear Service Manager:

Mark Church is a doctoral student in Educational Leadership and Policy Studies at Virginia Tech and is conducting a survey of service managers regarding their perceptions of ASE certifications for his dissertation. We are interested in gaining your opinions regarding the economic benefits to both your company and the automobile service technician. The results of the survey will be used in determining the need for and current utilization of ASE credentialing.

Your name was drawn at random from current members in the Virginia Automobile Dealers Association (VADA) directory or from an internet phone/address database. In order that the results accurately represent all Virginia Service Managers, it is very important that each questionnaire be completed and returned. Responding should take less than ten minutes of your time, but it will be critical to the success of the study. We urge you to complete the questionnaire either online at the address indicated on the survey form or in the enclosed envelope by September 13, 2006.

You may be assured that your responses will remain completely confidential. The return envelope and survey form has an identification number that will enable us to check your name off the mailing list when the questionnaire is returned. The envelope will then be discarded. Your name will never be placed on the answer sheet or the questionnaire.

If you have any questions about the study, please call or write. The telephone number for Mr. Church is 540-493-4841 and his email is wmchurch@vt.edu.

Your cooperation is greatly appreciated.

Sincerely,

W. Mark Church, Ed.S., Ph.D. candidate

Glen I. Earthman, Ed.D.
Committee Chairman
Virginia Tech

Enclosure
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Department of Educational Leadership and Policy Studies

College of Liberal Arts and Human Sciences
219 E. Eggleston Hall (0302), Blacksburg, VA 24061
(540) 231-5642 Fax: (540) 231-7845

University Exemplary Department

September 5, 2006

Automotive Service Manager

<<Name>>

<<Street>>

<<City, ST, Zip>>

Dear Service Manager:

A few weeks ago I wrote you and asked for your assistance in completing a survey regarding your perceptions of ASE certifications. To date, I have not received your responses, and I anxiously await your reply. The results of the survey will be used in determining the need for and current utilization of ASE credentialing. I hope that you will take a few minutes (less than 8!) and complete the survey and return it to me. You can complete the paper survey and mail or fax it to me (413-556-9075). You can also complete the survey online using the directions on the survey.

As I mentioned in my previous letter, your name was drawn at random from either current members in the Virginia Automobile Dealers Association (VADA) directory or from an internet phone/address database. According to the rules of data collection, I need a large number of respondents to validate my study. Currently only 30% of your counterparts have replied. As a random participant your input will speak for the larger population of service managers across the Commonwealth of Virginia. That is why your specific response is so vital to the study. As you may not be aware, Virginia Tech is not funding this study. I am personally financing this study including the cost of the mailings and paper. Your prompt reply is most appreciated.

You may be assured that your responses will remain completely confidential. If you have any questions about the study, please call or write. My telephone number is 540-493-4841 and my email is wmchurch@vt.edu. I know that your time is valuable. I appreciate the time you have taken to read this letter and the time it will take to complete and send the survey. Thank you.

GO HOKIES!

Sincerely,

W. Mark Church, doctoral student

Enclosure

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Appendix B

Automotive Service Excellence Benefits Survey

AUTOMOTIVE SERVICE EXCELLENCE (ASE) BENEFITS SURVEY

Dear Automotive Service Manager,

Thank you for your willingness to participate in this study. Please take a few minutes to fill out this survey on the benefits of Automotive Service Excellence (ASE) certification. Your feedback and your answers will be kept confidential. If you would like, you can also complete the information online using Virginia Tech's Survey System by entering the following URL:

<https://survey.vt.edu/survey/entry.jsp?id=1153320518887>

Please return the survey by September 13, 2006

YOUR INDEX NUMBER: **XXXX**

GENERAL INFORMATION**My company is best described as a**

- Dealership Independent
Service
Center

My company location is best described as

- Urban Rural Suburban

Do you personally hold any ASE certifications?

- None 1-3 4+ Master Certified

What is your gender?

- Male Female

What is your education?

- No High School Diploma High School Diploma/GED Some College/Technical School College/Technical School Graduate Post College/Technical School Training

RELATIONSHIP WITH YOUR LOCAL HIGH SCHOOL AUTOMOTIVE TRAINING PROGRAM

My dealership/company has a collaborative partnership for training with the local high school or technical center automotive service technology program.

Strongly Disagree Disagree Agree Strongly Agree

My dealership/company assists the local schools in preparing automotive service technicians

Strongly Disagree Disagree Agree Strongly Agree

The local school system automotive service technology program adequately prepares students for entry level technician positions within my dealership/company.

Strongly Disagree Disagree Agree Strongly Agree

OPINIONS REGARDING ASE BENEFITS

The following statements represent opinions. Kindly check your position on the scale as the statement first impresses you. Please indicate what you believe, rather than what you think you should believe.

IMPORTANT NOTES/ DIRECTIONS: ASE certification should mean one or more certifications and would not necessarily mean Master Certification. It also should be understood that ASE certification could mean that they have passed a test (i.e., brakes) and not fully qualified for certification due to age or length of employment requirements.

Statement	Strongly Disagree	Disagree	Agree	Strongly Agree	Not Applicable
ASE Value to Employer					
ASE certification is an appropriate indicator of competence within any service area (for example, ASE test for brakes competence or ASE test for suspensions competence, etc.).					
ASE certified technicians are more productive than non-certified technicians.					
ASE certified technicians require less supervision than non-certified technicians.					
ASE certified technicians require less on-the-job training than non-certified technicians.					
ASE certified technicians make the company more money over someone non-certified.					
My company encourages ASE certification of our employees.					
Most of our automotive technicians are certified in at least one ASE area.					
ASE certification attainment assists my employees in keeping up with automotive industry trends.					
ASE certified technicians perform higher level duty assignments than non-certified employees.					
ASE certification helps our customers feel more confident about the quality of work being done on their automobile.					
ASE Value to Employee					
My business pays ASE certification holders more than those without the ASE certification.					
My company pays the expenses associated with gaining ASE certification of our employees.					

ASE certification should be required for all technicians.					
Individuals with ASE certifications are typically more highly sought after by employers than those without the certifications.					
All other qualifications being equal, I would hire a non-certified candidate over an ASE certified candidate.					
Technicians with ASE certifications are better prepared than technicians without the certification.					
All other qualifications being equal, I would hire a recent high school ASE certified candidate over an older non certified candidate.					
ASE certifications are an important part of a technician's employment portfolio.					
Technicians with ASE certification(s) are held in a higher regard by other technicians for their ASE accomplishment(s).					
ASE certified technicians are more confident in the work they do.					
<p>Thank you for completing this survey. Please return the survey in the enclosed envelope by <u>September 13, 2006</u> to: Mark Church, 1125 Bluewater Drive, Moneta, VA 24121.</p>					

Appendix C

Institutional Review Board (IRB) Exempt Approval



Office of Research Compliance
1880 Pratt Drive (0497)
Blacksburg, Virginia 24061
540/231-4358 Fax: 540/231-0959
E-mail: ctgreen@vt.edu
www.irb.vt.edu

FVA00005721 (expires 7/20/07)
IRB # is IRB0000667

DATE: July 26, 2006

MEMORANDUM

TO: Glen Earthman
William Church

FROM: Carmen Green 

SUBJECT: **IRB Exempt Approval:** "Benefits of Student Credentialing: A Study of Automotive Service Managers", IRB # 06-416

I have reviewed your request to the IRB for exemption for the above referenced project. I concur that the research falls within the exempt status. Approval is granted effective as of July 26, 2006.

As an investigator of human subjects, your responsibilities include the following:

1. Report promptly proposed changes in previously approved human subject research activities to the IRB, including changes to your study forms, procedures and investigators, regardless of how minor. The proposed changes must not be initiated without IRB review and approval, except where necessary to eliminate apparent immediate hazards to the subjects.
2. Report promptly to the IRB any injuries or other unanticipated or adverse events involving risks or harms to human research subjects or others.

cc: File

Invent the Future

VIRGINIA POLYTECHNIC INSTITUTE UNIVERSITY AND STATE UNIVERSITY

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Appendix D

Demographic Characteristics of Participants

Appendix D

Demographic Characteristics of Participants (n = 178)

Characteristic	<u>n</u>	%
Service Managers		
Dealership Service Managers	102	81
Independent Service Managers	76	60
Company Location		
Urban	56	31
Rural	52	29
Suburban	70	39
Service Managers ASE Certification Status		
None	106	60
1-3	27	15
4+	10	6
Master Certified	31	17
(Left Blank)	1	<1
Gender		
Male	169	95
Female	9	5

(Appendix D continues)

(Appendix D continued)

Characteristic	<u>n</u>	%
Education of Service Managers		
No High School Diploma	4	2
High School Diploma/GED	50	28
Some College/Technical School	78	44
College/Technical School Graduate	37	21
Post College/Technical School Training	8	4
(Left Blank)	1	<1

Appendix E

Factor Analysis

Appendix E

Factor Analysis of Survey Questions (Varimax rotation)

Survey Questions	Cronbach's Alpha if Item Deleted	Eigenvalue
BENEFITS TO THE EMPLOYER		
1. ASE certification is an appropriate indicator of competence within any service area (for example, ASE test for brakes competence or ASE test for suspensions competence, etc.).	.89	.56
2. ASE certified technicians are more productive than non-certified technicians.	.89	.71
3. ASE certified technicians require less supervision than non-certified technicians.	.89	.67
4. ASE certified technicians require less on-the-job training than non-certified technicians.	.90	.54
5. ASE certified technicians make the company more money over someone non-certified.	.89	.71
6. My company encourages ASE certification of our employees.	.90	.40
7. Most of our automotive technicians are certified in at least one ASE area.	.90	.31
8. ASE certification attainment assists my employees in keeping up with automotive industry trends.	.90	.50
9. ASE certified technicians perform higher level duty assignments than non-certified employees.	.89	.68
10. ASE certification helps our customers feel more confident about the quality of work being done on their automobile.	.90	.35
BENEFITS TO THE TECHNICIAN		
11. My business pays ASE certification holders more than those without the ASE certification.	.85	.79
12. My company pays the expenses associated with gaining ASE certification of our employees.	.88	.45

(Appendix E continues)

(Appendix E continued)

Survey Questions	Cronbach's Alpha if Item Deleted	Eigenvalue
13. ASE certification should be required for all technicians.	.86	.73
14. Individuals with ASE certifications are typically more highly sought after by employers than those without the certifications.	.86	.80
15. All other qualifications being equal, I would hire a non-certified candidate over an ASE certified candidate.	.90	.08
16. Technicians with ASE certifications are better prepared than technicians without the certification.	.85	.83
17. All other qualifications being equal, I would hire a recent high school ASE certified candidate over an older non certified candidate.	.87	.64
18. ASE certifications are an important part of a technician's employment portfolio.	.85	.86
19. Technicians with ASE certification(s) are held in a higher regard by other technicians for their ASE accomplishment(s).	.86	.79
20. ASE certified technicians are more confident in the work they do.	.86	.80

VITAE

W. MARK CHURCH

1125 Bluewater Drive
 Moneta, VA 24121
 540-493-4841
 wmchurch@vt.edu

EDUCATION

- Ph.D., Educational Leadership and Policy Studies, Virginia Polytechnic Institute and State University, Blacksburg, Virginia (2007)
- Ed.S., Educational Leadership and Policy Studies, Virginia Polytechnic Institute and State University, Blacksburg, Virginia (2006)
- M.Ed. Educational Leadership, Lynchburg College, Lynchburg, Virginia (2000)
- M.S. Ed. Vocational -Technical Education, Virginia Polytechnic Institute and State University, Blacksburg, Virginia (1992)
- Participant. M.B.A. Program, Averett College, Danville, Virginia - completed classes in Organizational Management and Accounting (1989)
- B.S., Trade and Industrial Education, James Madison University, Harrisonburg, Virginia (1986)

CERTIFICATION

- Division Superintendent License, State Board of Education, Commonwealth of Virginia
- Post Graduate Professional License, State Board of Education, Commonwealth of Virginia. Endorsements: PreK- 12 Administration, Business and Industrial Cooperative Training

EXPERIENCE

- **Director**, Career and Technical Education (CTE); Franklin County Public Schools, Rocky Mount, VA. July 2000 to present
- **Adjunct Instructor**; James Madison University, Harrisonburg, VA. July 2001 to present. Taught courses in Human Growth and Development, Instructional Technology, Cooperative Education Administration, Career and Technical Student Organization Management and Leadership Development
- **State Director**; Virginia SkillsUSA-VICA (formally known as the Vocational Industrial Clubs of America (VICA)), Virginia Department of Education through Virginia State University. May 1996 to June 2000
- **Industrial Cooperative Training Coordinator**; Heritage High School, Lynchburg City, Virginia. July 1988 to June 1996
- **Industrial Cooperative Training Coordinator**; Broadway High School, Broadway, Virginia. July 1986 to July 1988

- **Adult Education Instructor**; Lynchburg City Schools Adult and Continuing Education, Lynchburg, Virginia. September 1992 to May 1996
- **Skills Development Coordinator/Instructor**; Summer Youth Employment Project, Lynchburg City Schools in conjunction with the Central Virginia Private Industry Council. Summers of 1992-95

WRITING and CURRICULUM DEVELOPMENT

- Contributing Author, "Keeping Employees Longer: Make Them Feel Like Family", Construction Journal, Chicago, Illinois (Spring 2000)
- Author, "Job Seeking and Keeping Skills", Career-Technical Education, Lynchburg City Schools (Summer 1995)
- Contributing Author, Advisor Training Modules, National SkillsUSA, Leesburg, VA (1991 - reissue 1999)

HONORS and AWARDS

- National Outstanding Educator Award, SkillsUSA (2005)
- Educator of the Year 2000, Virginia Association for Trade and Industrial Education (VATIE)
- Notary of the Public, Commonwealth of Virginia. Commission Expires October 31, 2008
- Kay Putney Gantt Award for Excellence in Economic Education, Greater Lynchburg Chamber of Commerce Economic Education Committee (1991)
- "Bull and Bear Teacher Award" (teacher of the year) given by the Virginia Council on Economic Education and the Virginia Stock Market Game for excellence in teaching economic principles (1992)
- Inductee, Virginia Vocational Industrial Clubs of America "Hall of Honor" (the highest honor Virginia VICA may bestow) (1989)
- Honorary Life Member, Virginia Vocational Industrial Clubs of America (1989)
- Brotherhood Awardee (multicultural achievement award), Heritage High School (1993)