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The Relationship of Academic Courses to Skills Required
Of Automobile Repair Technicians

by

Stephen H. Freund

A Dissertation submitted to the Education Faculty of Lindenwood University

in partial fulfillment of the requirements for the

degree of

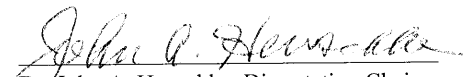
Doctor of Education

School of Education

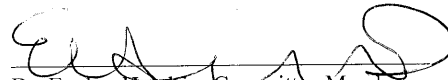
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This dissertation has been approved as partial fulfillment of the requirements for the
degree of
Doctor of Education
at Lindenwood University by the School of Education


Dr. John A. Henschke, Dissertation Chair

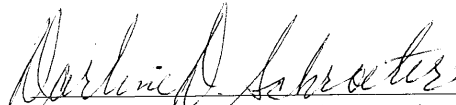
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Ms. Darline Schroeter, Committee Member

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Date

Declaration of Originality

I do hereby declare and attest to the fact that this is an original study based solely upon my own scholarly work here at Lindenwood University and that I have not submitted it for any other college or university course or degree here or elsewhere.

Full Legal Name: Stephen H. Freund

Signature: Stephen H. Freund Date: 3/18/13

Acknowledgements

The completion of this dissertation initially relates to Abraham Maslow's Hierarchy of Needs, and specifically, the fifth level on the hierarchy that is the need to self-actualize. Throughout my years of instructing college business courses, when I covered this material, I realized the challenge of fulfilling my potential as an educator. I am pleased to report that the Doctor of Education in Instructional Leadership Program at Lindenwood University enabled me to evolve from an instructor into a learning facilitator and advance me to this level on the hierarchy.

Throughout the coursework of the doctoral program and in the organizing process of my research, I received support and encouragement that proved to be instrumental in the completion of this dissertation. I would like to extend my genuine appreciation to Dr. John Henschke, who was my committee chairman, and to Dr. Evelyn Hendrix, Dr. Edward Perantoni, and Ms. Darline Schroeter who served as members of my committee. Dr. Beth Kania-Gosche and Dr. Yvonne Gibbs provided me with invaluable guidance throughout various areas of composing and structuring my material. In addition to the members of the academic community at Lindenwood University, I am also grateful to the employer representatives who took time out of their busy schedules to provide the interviews from which I obtained data necessary for my research.

My family and close friends also played an important role in the completion of this project by constantly inquiring about my progress and motivating me to continue. A constant reminder of the importance of my research was something Dr. Roger Reitz conveyed to his son, LeRoy, regarding his indecision to pursue an education in

automobile repair technology. Dr. Reitz's statement, "Without people like you, people like me couldn't get to work," emphasizes the importance of the current and future contributions the automobile repair technicians make to those of us who rely on cars and light trucks for our personal transportation needs. (I am happy to report that Dr. Reitz inspired LeRoy to become a skilled automobile repair technician whose education contributed to his ability to put more than one of my cars back on the road.)

My thanks also go out to all the educators who either directly or indirectly provide the quality instruction essential to this occupational career field. Finally, thank you to all of the individuals employed in the areas of mechanical and structural repair to our vehicles. I hope that my research benefits you.

Abstract

The primary objective was to show the important need of academic skills, specifically general education coursework, to the effectiveness of the technician's expertise in the field of automobile repair. Additionally, I emphasized that one of the keys to the quality of the technician's education is the method of instruction analyzed through Henschke's Five Building Blocks.

I communicated with 35 diversely selected and cooperative employers located in the Midwestern section of the United States. I obtained this arbitrary selection from the Yellow Pages of this region. I conducted personal visits to their locations at which time I informed them of the purpose of my study. Also, I performed an interview with the appropriate supervisor or manager. I acquired the degree requirements for the automobile repair technology programs at 19 regional postsecondary institutions and analyzed their contents.

I listed and assessed the employee requirements the employers conveyed to me. I noted the objectives of the academic courses included in the technical programs. I compared the employers' needs with the educational institutions' offerings to determine if and where there was a mismatch between the two entities. I judged and analyzed these findings in accordance with the specifications of the national *WorkKeys* research tools that indicated the following competencies at various levels:

- Applied Mathematics
- Workplace Observation
- Applied Technology

- Locating Information.

WorkKeys, the foundation of the National Career Readiness Certificate, is a job skill assessment system that helps employers select, hire, train, develop, and retain a high-performance workforce.

I identified specific contributions academic courses provided to the instructional areas of automobile repair technology. Additionally, further research into increasing academic course content is justifiable by the employer representatives' responses in this study.

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Chapter One-Overview of the Study

The composition of the structure and power train of the automobile has evolved significantly over the last century. The automobile mechanic position has advanced to the title of automobile technician. The mechanic was once able to determine the repair needs of a vehicle by raising the hood, then looking, or listening for the suspected problem. This basic troubleshooting method usually pinpointed the area that required repair, on the rare times it did not, the process of elimination became the next step. In fact, it was common for many automobile owners to perform maintenance on their vehicles in the 1960s and 1970s. But, as technology continued to advance, many drivers consider it impossible to conduct basic upkeep (Stein, 2007, p.1). The level of the reliability of automobiles progressed along with the sophistication of its components. The vehicles' body structures, engines, and transmissions became more complex. These advancements, in turn, required the repairperson to become a skilled technician in order to effectively diagnose the area of the specific problem and efficiently correct it.

Accurate diagnosis and repair of automobiles and light trucks is an increasingly complex issue in the 21st century. Government regulations continue to impose design restrictions in the areas of safety and environmental demands that the manufacturers cannot ignore. When technicians are fixing a problem, the overall quality of their skill set can affect the profitability of their employer and the satisfaction level of the customer. The primary objective of this project is to relate the need and the importance of academic skills, obtained through general education coursework, to the effectiveness and efficiency of the automobile repair technician's expertise in his or her field of employment.

AUTOMOBILE SKILLS REQUIRED AND ACADEMIC COURSEWORK 2

The primary research question is: What educational needs, if any, do employers perceive their automobile repair technicians require for an improved training program?

The secondary research question is: How important is it for the employee in the automotive repair, physical and mechanical repair to cars and light trucks, profession to have more than a technically-specific education to be thoroughly effective? The objective of the study is narrowed down and in the third research question that seeks to determine what, if any, academic skills are lacking. The method used was interview questions about the current skill set and the desired skill set of the automobile repair technicians.

A theoretical assumption in this study is that an employer of automobile repair technicians can specify their occupational needs. Educational institutions may then adjust their programs based on the collective information supplied by the employers. Furthermore, individual customers requiring automobile or light truck repair may benefit from more highly skilled technicians who are servicing their vehicles.

The career paths to success in automotive technology are more diverse and require increased levels of education. Having an understanding of the moving parts and basic structure of the automobile is not sufficient. For example, since 1975 when electronic ignitions and unleaded gasoline became standard, technicians had to upgrade their skills. An example of the increased complexity of a vehicle's wiring is apparent by comparing the wiring diagrams of a 1959 Porsche versus a 2006 Saab. One five by eight inch sheet of paper displays the 1959 Porsche's complete diagram. In contrast, the 2006 Saab's diagram encompasses 200 eight and one-half by eleven inch pages with dozens of wires and several control units. Replacing electrical parts for the 1959 Porsche was a

smaller, simpler, and cheaper job whereas the ability to repair a control unit in a 2006 Saab is beyond the ability of a basic mechanic (Pfeiffer, 2010, p.1).

I know of no other work in this area of study that currently exists. Another dissertation focuses on the comparison in job performance of certified versus non-certified technicians (Kolo, 2006). The author's findings concentrated on the evaluation of an independent agency. My assessment examines the relationship of academic courses to the skills required of automobile repair technicians.

Background of Study

During the early development of the United States, essential advancements in transportation improved both the economy and the lives of citizens. In the beginning, the horse had multiple purposes. While many people chose simply to ride the animal outfitted with a saddle and a bridle, others harnessed it to a wagon or to a stagecoach. As a result, the horse transported people, supplies, and communications.

Another early means of travel and transport utilized rivers and other waterways. When a mule or a horse walked along the shore pulling a vessel filled with cargo, it could move a much heavier load. After its invention, the steamboat transported passengers, products, supplies, and communications more efficiently especially against the current of the water. In some places where adequate waterways did not exist, man created canals. Since the region of a canal commonly had varying elevations, the labor force had to construct locks into the channel (Post, 2007, p. 4).

In addition, the population started dirt roads and a railroad system. The invention of the bicycle partially spurred an interest in more and better roads (Bellis, n.d., p.2). In cities residents employed railroad technology by putting down tracks in the streets and

having horses pull horse cars along them. With the cars running on rails, the horses pulled large loads of several passengers and provided the primary mode of mass transportation. Individuals conceived the cable car, electric streetcar or trolley, trackless coach, elevated train, and subway systems (New York Transit Museum, 2010, pp. 1-2). This progress facilitated the growth of the city by enabling a worker to live in a location far from a job and to make use of various sites for entertainment and shopping. Quicker, easier, and more comfortable travel as well as reasonably priced fares benefited the inhabitants and the visitors.

The absence of factories and assembly lines during this period indicated the need for early vocational tradesmen and their small manufacturing facilities. These people acquired their skills from self-teaching or from observing and imitating their parents. Their superiors deemed youngsters able to pick up the necessary knowledge required to start in the particular trade when they reached an arbitrary, teachable age (Barlow, 1976).

The 19th century included the completion of the Transcontinental Railroad and the beginning of automobile production. Progress advanced the Industrial Revolution from the first phase to the second phase. As indicated by Wirth in 2001, professional historian, Frederick Turner viewed the decade of the 1890s to the conclusion of the century as the first phase. He referred to this period of the Industrial Revolution as a crucial dividing point in time. In his viewpoint, the United States ended the pioneering exploratory phase and the expansion period of agriculture in preparation to advance to the second phase of the Industrial Revolution.

This progress involved embarking on a worldly and wise America entrenched in industry. Assembly lines, the new principal tools of production, emerged and replaced

the predominately farm-centered and craft related skills. The influence of this long-lasting movement permeated not only society but also the schools (Wirth, 2001). The railroad connected the East to the West and provided individuals with the ability to travel and to transport goods across the nation rapidly and cheaply. These benefits helped industries to grow by establishing both national and international business. The populace started new communities that prospered long distances from coasts, waterways, and cities because of a link to the railroad.

Although the bicycle spurred interest in creating and improving roads, by 1900, it became nothing more than a fad at that time. The usage of it was in decline to the point that many manufacturers declared bankruptcy. Those that survived progressed to the manufacturing of horseless carriages (Brinkley, 2003, p 27). Coincidentally, the bicycle influenced the standards of mechanical precision, the quality of metals, and the production methods that went into the development of the first automobiles (Nevins, 1954, p.186). It was in the early part of the 20th century, when Henry Ford's passion to develop an affordable, mass produced vehicle gave people wide-ranging freedom and mobility. The automobile changed their lives substantially. Progress expanded urban areas, and those individuals living in rural regions found the city and all that it had to offer finally accessible to them (Schultz, 1999, p. 7). In most cities, buses eventually replaced trolley cars. In addition, people designed and built a system of surfaced roads, highways, and interstate highways throughout the nation. As a result, individuals commenced traveling comfortably and swiftly from place to place across the states by car, motorcycle, or bus. Delivery trucks came into use and began hauling a multitude of products for a range of industries.

AUTOMOBILE SKILLS REQUIRED AND ACADEMIC COURSEWORK 6

The creation of many new businesses and jobs: motor vehicle sales, gas stations, repair shops, and construction represented another effect of the automobile, as well as other motor vehicles (Bottorff , n.d., p.6). However, the availability of these personal and commercial vehicles caused a decline in business for the railroads. High-speed rail and Amtrak eventually were improvements that attracted and better served the needs of passengers. The introduction and the development of commercial aviation also drastically changed lives, travel, and the nation by providing an inexpensive, rapid link to the entire globe of people, places, cultures, and businesses (Altius Directory,2007, p.1).

For the most part, capable artisans made possible the rapid progress in the development of the United States. As the colonies grew, those individuals who earned their living as village blacksmiths shod horses; shaped other metal objects and tools such as wheels, plows, hammers, nails, and knives; and repaired items for the townspeople or the farmers. The blacksmith utilized his critical skills in other situations like shipbuilding, logging, and equipping the war effort. While early blacksmiths developed the ability to work in every area of their profession, eventually many of them specialized in just one of several fields as a locksmith, a gunsmith, or a farrier. Over time, blacksmiths used different processes to improve steel and metal, and modern manufacturers still utilize these high quality developments (Allen, 2008, p. 3). Then with progress, factory-made goods took business away from the blacksmiths because people purchased the mass produced items at a cheaper price. At the same time, motor vehicles replaced the horse in the transportation of people, supplies, and communications. Consequently, the village blacksmith adapted his expertise to a new profession. Some

maintained the manufacturing equipment in the factories; others repaired motor vehicles or welded iron.

For an extended period, the blacksmith had a thriving business. He had children labor in the shop as helpers both out of necessity and as a means of passing on the trade. While they worked, the boys learned the skills of the job. After some years, they achieved the status of blacksmith and opened their own shops (The village blacksmith, n.d., p. 1). This apprenticeship arrangement used by artisans like the blacksmith was an early form of vocational education and on-the-job training (Linkroll, 2007, p.1).

As previously stated, automobiles replaced horse drawn vehicles, and workers like the blacksmith learned a new skill. One line of work that came into existence was the tradesman who could maintain and repair those early motor vehicles. As individuals expanded the number of cars on the road, this growth increased the need for mechanics and for body shop repairpersons. In earlier years, many people did their own mechanical work; now few follow this practice. The vehicles of today have more complex computer and electronic equipment, and these technological advances require an increasing level of expertise as well as the use of special tools and costly equipment. The automobile repair technician is the result of a higher level of education and skills in the automobile mechanic or the body shop repairperson (Bureau of Labor Statistics, 2011, p. 1).

Statement of the Problem

As the United States entered the 20th century, the Industrial Revolution rapidly gained momentum. The school system realized the importance of supporting industry by preparing secondary level students with related education. In 1904 Charles Richards who was then editor of *Manual Training Magazine* proposed the term *industrial arts*. At the

point in time when he suggested the name, Richards was writing an editorial with the intent to alter the focus of education as it applied to training those individuals who were seeking employment requiring manual labor. Richards contended that this new educational field should have the study of industry at its core. Since the concept seemed plausible, the majority of the school districts in America eventually adopted industrial arts courses as a subject area available to students. Although the recognition and the direction in this field of study remained satisfactory for a while, by the late 1920s, industrial leaders began promoting the idea that focusing on industry yielded education would become too limited. They advocated that the advancing area of technology would provide a broader base of study and would offer more suitability for future pursuits in education. A recognizable transition of this sort would not actually secure favorable reception until the decade of the 1970s, and a conceptual transformation from industrial arts to technology education would not gain momentum until early in the decade of the 1980s (Litowitz & Warner, 2008, p. 520).

In 1986, the United Nations Educational Scientific and Cultural Organization (UNESCO) in its book, *The Integration of General and Technical and Vocational Education*, emphasized that “technical and vocational education” should be a comprehensive term. The following excerpt elaborates on the preparation that should continuously be in place for the benefit of educational systems and society:

Given the necessity for new relationships between education, working life, and community as a whole, technical and vocational education should exist as part of a system of lifelong education adapted to the needs of each particular country. This system should focus on:

- (a) abolishing barriers between levels and areas of education, between education and employment, and between school and society through:
 - (i) the integration of technical and vocational and general education in all educational structures above primary level;
 - (ii) the creation of open and flexible educational structures;
 - (iii) the taking into account of individuals' educational needs and the evolution of occupations and jobs;
- (b) improving the quality of life by permitting the individual to expand his intellectual horizons and to acquire and to constantly improve professional skills and knowledge while allowing society to utilize the fruits of economic and technological change for the general welfare.

(pp. 9-10)

Purpose of this Study

The primary objective of this project is to relate the need and the importance of academic skills, obtained through general education coursework, to the effectiveness and efficiency of the automobile repair technician's expertise in his or her employment. An example of this would be the need for a technician to complete repair estimates or repair reports. Supervisors, customers, as well as factory and warranty personnel often closely scrutinize these types of reports. Through the completion of an English Composition course, a student can potentially gain the academic skills necessary to benefit him or her in this area.

Research Questions

The research questions for this study are as follows:

RQ1: What educational needs, if any, do employers perceive their automobile repair technicians require for an improved training program?

RQ2: How important is it for the employee in the automotive repair (physical and mechanical repair to cars and light trucks) profession to have more than a technically-specific education in order to be thoroughly effective for his or her employers?

RQ3: What, if any, academic skills are lacking?

These research questions formed the basis for determining the interview questions that I asked. In order to determine the actual type of needs required of automobile repair technicians, I sought to communicate with 35 diversely selected and cooperative employers from the bi-state (Missouri and Illinois) area. This is possible because of the number of business in the St. Louis metropolitan area. I accomplished the contacts through a personal visit to their locations, performed an interview with the appropriate manager, and posed the following questions to them.

Interview Questions

1. What presently does your workforce do well---as far as their work is concerned?
2. What do they not do well?
3. What do you wish your employees could do or know---that they presently can not do or do not know?
4. If you could suggest something the individual employee could learn that would

benefit them and your organization, what would it be?

5. After reviewing the list of courses required from the colleges, what are your thoughts?

Next, I listed and assessed the employee requirements that the employers conveyed to me. In addition, I noted the objectives of the academic courses included in the technical programs at 19 educational institutions.

I then compared the employers' needs with the educational institutions' offerings, judged, and analyzed these findings in accordance with the national *WorkKeys* research tools indicated in the following competencies at the various levels:

- Applied Mathematics
- Workplace Observation
- Applied Technology
- Locating Information (ACT, 2010).

Importance of the Study

This proposed project merits accomplishment because it investigated the skill set that employees require in the field of automobile repair technology. I examined the relationship of academic courses to the skills required of automobile repair technicians. I accomplished this undertaking by obtaining curricula (the set of courses and their descriptions) from technical colleges and departments and compared this information with data from employers who opined their occupational needs. At the conclusion of the study, the technical colleges or departments may elect to compare these requirements with their curriculum offerings. One of the possible outcomes would be a higher level of

student mastery of his or her occupation through the means of a more comprehensive program. The option to revise or add to their curricula will be available at the discretion of the providing educational institutions. Positive outcomes of this process would be enriched technical degree programs that will better meet the needs of the employers of automobile repair technicians.

Limitations of the Study

The focus of this study was the comprehensive set of skills the automobile repair technician needs to be both effective and efficient in the work environment. The skills required in the technology used in future models of cars and light trucks determined the limitations I faced. This research did not determine modifications needed to strengthen future automotive technology curriculum as technology advances. Various concepts for alternative sources of power in automobiles have caused much speculation for decades. However, in the United States, as well as in other developed nations that have widespread automobile usage, technological preparation has no clearly defined future direction. Thus, colleges are in a predicament. They cannot determine modifications such as the general education courses needed to strengthen their automotive technology curriculum (Barger, 2004, p. 1).

This research did not assess the technical aspects of the study in automobile repair technology and its possible shortcomings. Nor did it examine the instructional practices employed by instructors who teach the strictly technical elements of a program. Instead, the study focused on the need for integration of the elements with attributes of general education coursework needed. The benefits derived by the employers, the educational institutions, and the students who will become future employees were the results sought.

The 35 diversely selected employers whom I communicated with were a varied group. They ranged from franchised dealerships with over 100 technical occupation employees to independent businesses with only five employees. The 19 colleges whose curricula I researched were also diverse in regards to the communities they serve. They varied in location from urban, suburban, and rural settings.

I did not obtain a psychologist's view of my interview questions and possible resulting answers that would reflect the psychologist's point of view on getting answers to the interview questions I was asking. In addition, I did not conduct a trial run of the interview questions I asked the interviewees. Consequently, based on these two things, the potential for bias exists in the results from their responses.

Employers need to understand that their participation in my research created the opportunity for benefits to them through a positive change. However, I also had the responsibility to inform them to consider having automobile repair technicians who possess a diverse set of skills. This mindset, on their part, opened up communication channels and enabled me to obtain a greater amount of information that I am be able to convey to the educational institutions. Upon examining the results of my study, the schools may examine the effectiveness of their program, as well as the need for revisions, in order to meet the requirements of their students.

Assumptions

- The first assumption was it is important for employers in the automotive repair industry to understand that my research may create the opportunity for them to derive future benefits through potentially positive changes in the automobile technicians' education.

- The second assumption involved the potential for growing relationships between academic courses and the skills required of automobile repair technicians.
- The third assumption was the ever-increasing complexity of the curriculum needed in this occupational area and the level of technology that continues to escalate.
- The fourth assumption excluded automobile repair technicians who went directly from high school into this area of employment and received on-the-job training.

Barriers of the Study

I anticipated experiencing various barriers while attempting to accumulate the data. In addition to appointments I had to reschedule, there were employer representatives who cited reasons involving company policy that prevented them from disseminating responses to my questions. Some also refused to provide an interview. There were other situations where noise, managerial responsibilities, and telephone calls interrupted the communication. Even though I made every effort to clarify each of the five questions, on occasion, there were some misunderstandings on the part of the interviewees in their responses.

Definition of Terms

Terms defined for the study included adult learner, automobile repair technician, career technical education, critical thinking, formal education, industrial arts, National Institute for Automotive Service Excellence, Smith-Hughes Act, and vocational education.

Adult Learner.

This person is an individual who has left high school and is continuing his or her

education.

Automobile Repair Technician.

This person is an individual who works on the mechanical, electrical, and electronic elements of cars and light trucks. The occupational category also includes an individual who performs structural or physical reconditioning to these vehicles for the purpose of restoration or correction due to collision.

Career Technical Education.

This educational category focuses on helping students learn skills that can apply directly to occupational fields. The study of automobile repair technology falls under the classification of career technical education because the coursework emphasizes training the student to acquire skills that will enhance his or her employability as a technician in the workforce (Alfeld, Aragon, Hansen, & Stone, 2006, p. 2). Due to advancements in technology, this term became more applicable than the vocational education term of auto mechanic to use in the latter part of the twentieth century (Litowitz & Warner, 2008, p. 520).

Critical Thinking.

Critical Thinking involves a process in which an individual gathers information he or she reasons to be pertinent to a situation of concern, strives to arrive at a logical conclusion, and implements the decision intended to correct the problem. Baldwin (2005) noted in her book six critical thinking steps to solve any problem:

1. Clearly identify the problem.
2. Brainstorm possible solutions to the problem.
3. Evaluate the viability of each solution.

4. Make a list of pros and cons of each solution.
5. Choose the solution that potentially works the best.
6. Evaluate the solution after it is in place. (p. 1)

Formal Education.

Formal education involves a structured and certified program that includes a process of training and developing people in knowledge, skills, mind and character. In this type of education, trained instructional staff who meet educational standards in a designated field of study teach scholastic material from a specified curriculum (Corporation for Public Broadcasting, 2002, p.1).

Industrial Arts.

In areas of education when the study of industry was the core component in the early part of the 20th century, *industrial arts* was the most applicable term to utilize. Although various interpretations of the term are utilized, the original definition dates back to Bosner and Mossman in 1923, and is stated as the following, “Industrial arts is a study of the changes made by man in the forms of materials to increase their values and of the problems of life related to these changes” (p.5). The focus was toward manual trade preparation.

National Institute for Automotive Service Excellence.

The National Institute for Automotive Service Excellence is an independent non-profit organization established in 1972 for improving the quality of vehicle repair and service. Automobile repair technicians must successfully pass examinations in one or more of 40 areas to gain the professional certification. It verifies competence in that particular skill set. The technician also must provide proof of having at least

two years of relevant work experience to earn this certification. Professionals in every segment of the automobile service industry may gain membership (2010, p.1).

Smith-Hughes Act.

This act of 1917 began the major federal influences in molding and shaping secondary and postsecondary (i.e. sub baccalaureate level) vocational education. This legislation was a response to a complex set of social, economic, and political forces. In particular, it prepared youth for jobs resulting from the industrial revolution and provided an alternative to the general curriculum of schools, which were “too exclusively literary in spirit, scope, and methods” (Swanson, 1951, p.16).

Vocational Education.

This area of education refers to “a planned series of learning experiences [with] the objective of [preparing] individuals for gainful employment as semi-skilled or skilled workers, [technicians], or sub-professionals in recognized occupations and in new and emerging occupations” (Litowitz & Warner, 2008, p. 520). The Vocational Education Act of 1963 also characterized vocational education as “organized educational programs which are directly related to the preparation of individuals for paid or unpaid employment, or for the additional preparation for a career requiring other than a baccalaureate or advanced degree” (Lectric Law Library, 2011, p.1).

The passage of this act expanded the scope of industrial arts through the authorization of increased funding for specialized training in career areas such as auto mechanics. Additionally, vocational education encompassed broader goals that would contribute towards developing human potential and facilitating long-term employment (National Research Council, 1976, pp. 7-8).

Summary

In Chapter One, I provided an overview of the study detailing the introduction of the automobile into society. This material included the

- background of the study,
- statement of the problem,
- purpose of the study,
- research questions,
- importance of the study,
- limitations of the study,
- assumptions,
- barriers of the study and,
- definition of terms.

Chapter Two involves researching the background of the literature review and the skills needed in the area of automobile repair technology. Complementing this need, the areas of formal education and informal education will both be components of my research in the forthcoming chapter. My focus was toward the contributions that academic courses can make to an automobile repair technology curriculum and the benefits of integrating them with technically specific courses.

Chapter Three concentrates on the methodology employed that presents the process of research applied in this dissertation. It consists of a qualitative study that includes gathering both primary and secondary data. This data focuses on the knowledge, skills, and abilities that employers are seeking and postsecondary schools are providing in their curricula.

Chapter Four includes and communicates the data gathered from the research questions and the interview questions. The result of this presentation enables me to delve into the actual need that exists for automobile repair technicians to possess a skill set that extends beyond the hands-on aspect of their profession.

Chapter Five revisits the research questions and discusses the data that applies to them. It also provides an analysis of the results from the data and presents a structure for potential modifications of curricula at postsecondary educational institutions that offer automobile repair technology programs. Through the examination of data and analysis of results, the intent of the study was to relate the importance and subsequent need for academic skills (obtained through general education coursework) to the efficiency and effectiveness of the automobile repair technician's expertise in his or her field of employment. I drew conclusions from the data and reflected on the changes that occurred in my own perspective as well as the information gleaned from the participants involved in my study. I planned to achieve the maximum amount of benefit from my study by being receptive to alternative interpretations of the data involved.

Chapter Two: Literature Review

The following quote, “What is really required today are programs and experiences that bridge the gap between the so called ‘academic’ and ‘vocational’ courses,” (Prentice, 2001, p. 80) indicates the critical components necessary in the literature review of a research study for any technical field as applied to the skills required in the automobile repair profession.

In the Literature Review I include a background of the literature reviewed on the subject of automobile repair technology, skills needed, formal education, and informal education surrounding it.

Individuals and organizations have addressed this gap and have determined the gap is a dilemma that exists in curricula. Educators in career education areas have the responsibility to determine and to satisfy the needs of students who face this gap. Governmental and private educational organizations have the responsibility of providing direction to educators and educational institutions. Additionally, individuals affiliated with the field of education have conducted meaningful research and have contributed to progress benefiting technical curricula throughout the years. The following material details the background of organizations and individuals involved in this movement.

Background of the Literature

Many students have elected a career in a technical occupation and need education in that field to be qualified to perform at required levels. Education professionals, who design the curriculum for the various technical programs, have recognized the need for these students to increase their knowledge of general education subjects and to have the

ability to apply it toward the study of their selected career field. The problem of vocational education becoming distinct from academic education surfaced at the turn of the 21st century (Grubb, 1997, p.78). Unfortunately, this situation persists among the instructors who strictly specialize in one area of study, either technical education or general education, and who continue to cover their subject material in a separate manner with only a narrow focus. This practice causes students to question the value of general education courses in their technical program and results in the necessity for curriculum integration in both areas of study (Zirkle, 2004, p.24). In the 21st century, a key decision maker who determines the skill level necessary in the workplace is the employer. Organizations that exist to analyze technical career fields have reported that employers point to the educational institutions for the responsibility of fully preparing the students to be adequately primed for the workforce. (Goldman & Schmalz, 2009).

Skills Needed

The current field of career-technical education is the result of evolution that began in the early part of the 20th century with formal vocational education. However, this area of education has an increasing need for a higher level of competence in the 21st century. Most students best attain mastery with complementary coursework, and the general education curriculum provides accompanying skills. The administrators at schools, which offer automobile repair technology programs, need to have the mindset that when the students are taking classes, the course content should be teaching more than just basic skills for their first job. Instead, they should be gaining skills that will apply either directly or indirectly to their chosen profession.

Formal Education Course Areas and Their Potential Contributions

An official definition of formal education is as follows, “A formal education program is the process of training and developing people in knowledge, skills, mind, and character in a structured and certified program” (SIL International, 1999, p.1).

Postsecondary educational institutions that offer automobile repair technology programs provide coursework intended to develop the knowledge necessary to achieve proficient skill levels in students. A key word in this definition is *program* because it indicates the education involves a set of activities that has a specific purpose and a plan of action for achieving a goal. In this application, an automotive technology repair program would include academic courses effectively complementing technical courses that assist in developing skills pertinent to the profession. As shown in Table 1, I have provided a list of 19 educational institutions in the Missouri and Illinois areas offering automotive repair technology programs that I researched.

An analysis of the associate degree programs in automobile repair technology curricula from the educational institutions in Table 1 revealed the formal academic course areas required. Here is an alphabetical listing of 10 course areas with justification for their inclusion in the programs. The exception to the course areas required is that of a secondary language. Although none of the educational institutions specified these courses, there is rationalization for the contributions it could provide. If customers in an employer’s geographic area speak a secondary language, mastery of this particular dialect by a technician could prove to be a competitive edge for the repair establishment. An example of this application would be the states that border Mexico (Texas, New Mexico, Arizona, California) attract immigrants. This skill could prove to be beneficial for an

employer. Although none of the educational institutions researched requires a secondary language, foreign language courses are part of the humanities area in the curricula at many postsecondary institutions. Four of the 19 institutions provide the option to take a humanities course to satisfy an academic course category requirement.

Behavioral Science and Social Science coursework. Studies in sociology and psychology courses provide the ability to be aware of and to understand the social and cultural differences of a diverse community. The interconnection of this area of study with a secondary language can contribute to an appreciation of an alternate socioeconomic background. History courses contribute to the understanding of how societies evolved and thusly behave (Stearns, 2012, p. 1). Political science courses also cover social, cultural, economic and political aspects that help the student to realize the influences of the past, to achieve enlightenment about the present, and to imagine the future.

Business or management class. A class in this area can further critical thinking exercises to the point of problem solving. The use of this skill can break down complexities in technical education. Exposure in this subject can provide conflict resolution and cover potential situations that might arise with customers, vendors, or even fellow employees. An ancillary benefit the technician can derive from this academic course section is the ability to understand the responsibilities his or her employer handles on a constant basis.

Computer-related technology courses. Technicians in the 21st century must also have adeptness in applying computer-related technology to their duties. This area of competence would include the diagnostic equipment that relies on technical knowledge

and computer interfacing (Bureau of Labor Statistics, 2011, p. 2). Electronic modules have improved the overall operation of vehicles as they have replaced mechanical components. The technician benefits when the subject material has a direct application to his or her area of specialization.

English composition subject areas. The automotive technology student needs to gain essential strengths required to achieve effective written language capabilities. A specific application in the proficiency of English composition would apply to technical writing and the skills necessary for the automobile repair technician who has to complete reports and fill out forms. This knowledge can help the individual communicate in writing in a professional and concise manner.

Health and wellness courses. Students in technical career fields need to pursue a healthy lifestyle through proper nutrition and physical exercise; they can also benefit from an understanding of industrial safety practices and first-aid knowledge.

Humanities course. Logic and philosophy can confer critical thinking skills to the technical education student. This aptitude strengthens the ability to conduct analytical processes. Additionally, ethics plays an increasingly necessary role for both private and public sector technicians (Jones, 2002, p. 8). The notion that should prevail is that ethical behavior is a necessity for continuance in the service-oriented field of automobile repair. The 2010 National Institute for Automotive Service Excellence Certified Technician's Code of Ethics elaborates on this concept. Coursework in a program should include examples and cases that focus on potential situations in the workplace which emphasize the long-term benefits of ethical behavior (p. 1).

Mathematical computations. The automobile repair technicians will perform mathematical computations as they find themselves researching prices for repair parts (Bureau of Labor Statistics, 2011, p. 3). Accuracy has importance in providing a quoted or written damage repair estimate for the customer. The correctness of calculations performed in the computations of the technician determines the amount of profit and the ability to be competitive on a service and repair job. In order to be knowledgeable of the tolerances, which are an integral element of the workings of the internal combustion engine, the technician must have an understanding of the decimal system.

Physical sciences. The study of the interaction between science and energy applies to the physical laws that communicate an understanding of the transformation of motion into power. The automotive technology student who has an understanding of these concepts will be more capable of relating to the feasibility of the transmission of engine horsepower to the axle or axles that are responsible for actual movement of the vehicle.

Public speaking or oral communications course. Courses in this area would give technicians customer relation skills. Improved speaking abilities can facilitate client consultation and possibly prevent problems such as various forms of bias. Ancillary benefits from this area of study could also include appropriate volume, enunciation, and speed of verbal communication (Bureau of Labor Statistics, 2011, p. 4).

Secondary language. Depending upon the most popular secondary language spoken in the geographic area of the repair facility, mastery of this particular dialect can enhance the level of service provided to the customer. An example of this would be the states that border Mexico (Texas, New Mexico, Arizona, and California) attract

immigrants. This talent could prove to be a competitive edge for an employer. Although none of the educational institutions researched requires a secondary language, a foreign language course is categorized in the humanities area. Four of the 19 institutions provide the option to take a humanities course to satisfy an academic course category requirement.

While formal academic coursework may not be directly applicable to the skills required of automobile repair technicians, the contributions cited from the previously mentioned courses indicate their complementary value. Additionally, as technology in automobiles progresses, academic courses that strengthen the technicians' ability to diagnose and repair an automobile will be critical. The increasing level of technology required in automobiles indicates that accompanying skills achieved through academic courses are a necessity now, and will continue to be in the future.

Informal Education

In 1776 (prior to the organizing process of vocational education), there were three methods in which boys and girls prepared for work in the newly formed United States of America.

Organized Apprenticeship. An organized apprenticeship was the first recognized method. In addition to food, clothing, and shelter, participants also received religious instruction, general education (the three R's), and instruction in a trade or occupation. This instruction would often include the "mysteries of the trade," related subjects of the trade or occupation, where it was necessary (Barlow, 1976).

Father-Son or Mother-Daughter Work Skill Relationship. The second method of preparing for work was the father-son or mother-daughter work skill

relationship. Here, children learned the fundamentals of the family occupation or trade when they reached a teachable age (Barlow, 1976).

Pick-Up Technique. The “pick-up” technique was the third method. This form of education, which relied upon observation and imitation, included a minimal amount of actual instruction. However, if the boy or girl wished to learn the trade, he or she ultimately could pick up the necessary knowledge required to begin the line of work (Barlow, 1976).

Technical Education

Students can achieve the actual mechanical or technological aspects of an occupational area through participation in a technical education program. A concise definition of technical education is as follows:

Technical education is the academic and vocational preparation of students for jobs involving applied science and modern technology. It emphasizes the understanding and practical application of basic principles of science and mathematics, rather than the attainment of proficiency in manual skills that is properly the concern of vocational education. Technical education has as its objectives the preparation of graduates for occupations that are classed above the skilled crafts but below the scientific or engineering professions. People so employed are frequently called technicians. (Technical education, 2012, p.1)

In the early part of the twentieth century, technical education concentrated on providing knowledge of industry to the students interested in that area. As the focus shifted to learning experiences, vocational education made its appearance and eventually

progressed to career technological education as modern technology evolved. I listed and explained the progression of these eras herein.

Industrial Arts. In the year 1904, the term *industrial arts* made its appearance for the first time in literature. It was then that Charles Richards, who was the editor of *Manual and Training Magazine*, proposed it. His basis for the name was the belief that this was a new field, and its focus should be the study of industry. Even with the recognition and acceptance of industrial arts as a subject area, many leaders in the field believed that this study of industry was still too narrow (Litowitz & Warner, 2008, p. 519). The situation that persists in technical education involves instructors who strictly specialize in either technical education or academic education. Zirkle recognized that the focus on the study of industry explicitly was 100 years old, was too narrow, and emphasized the need for curriculum integration in the 21st century (2004, pp. 24-26).

Vocational Education. The term vocational education meant a planned series of learning experiences, the specific objective of which is to prepare individuals for gainful employment as semi-skilled or skilled workers or technicians or sub-professionals in recognized occupations and in new and emerging occupations (Litowitz & Warner, 2008, p.519).

In 1914, the Commission on National Aid to Vocational Education focused on the concern that public education was falling short. It held the belief that schools catered primarily to the small group of students who had intentions of going on to college instead of having catered to the larger number who would head toward industry. The proposed action to correct this imbalance established vocational training on a large scale. Such an effort would provide an alternative for those students who were dropping out of school at

the then permitted age of fourteen. The intention encouraged general education in schools, provided an incentive for continuing one's education, and helped students move from a non-educative occupation as an unskilled laborer to a skilled worker who would be more in demand by industry (Miller, 1985, pp. 13-14).

The growth of vocational education also acquired momentum from Snedden (1910). In his position as Commissioner of Education for Massachusetts, he stated,

...in the shifting currents of social progress, some institutions once powerful are left weakened, if not helpless, while other institutions wax strong to meet the demands of time. The homes of the urban industrial classes have not the moral influences over children once exercised by the family life of the farmer; the church grips fewer members with its theological doctrines than it did a century ago; the trades do less for their apprentices in the modern factory than they did when lodged in the household; the press has more influences; libraries are more plentiful; and the school has grown to be a modern giant where once it was a puny babe. (pp. iii-iv)

To further direct attention to vocational education, Snedden (1910) characterized it as aimed more toward specialization with the capability of providing further training for the student who had the capacity to earn a living and to contribute toward productive work.

Since the passage of the Smith-Hughes Act in 1917, vocational education made progress through recognition, revision, and reform. However, Lynch (2000) brought attention to this evolution with the following statement.

Program areas or fields of study matching the specific industrial categories called for in the legislation were developed and have persisted with great gusto over the past 80 years and others have been added: distributive education, business education, health occupations, technical education, occupational home economics (focused on wage-earning preparation in contrast to the original act, which focused only on homemaking), and industrial arts. Thus each of these areas (although several now have different names) were developed with separate teacher certification of training programs, usually separate state administrators and often separate local supervisors, sometimes with separate (but relatively small) pots of funds, separate teacher organizations, separate youth clubs or organizations, and separate lobbyists for federal and state funds. These separate programs, especially through their teacher and youth organizations, became very powerful and influential. (p. 8)

Career Technical Education. This term evolved from vocational education with the objective of helping students learn skills that include a technical element they can apply directly to an occupational field such as automobile repair technician (Alfeld et al. 2006, p. 2). The previously used occupational title of *auto mechanic* focused primarily on the skills acquired through schooling in the vocational education era (Litowitz & Warner, 2008, p. 520).

Integration of Formal Academic Education with Technical Education

As the 21st century ushered in a new era of technological applications and uses, the focus of vocational education was clearly trade preparation, whereas a focus of technical education encompassed broader areas of study. During the 20th century,

institutions conformed to an organizational hierarchy. Today as organizations decrease their levels of operation, employees can no longer become divisions of rigidly separate white-collar and blue-collar workers. Instead the two groups should function as teams and have open lines of communication (Lewis, 1998).

The Caterpillar Company. The leaders of this information-involvement movement are organizations such as the Caterpillar Company. Rather than confining their dealer service technicians to only mechanical-related classes, this particular employer includes general education courses as an integral part of the program. These courses enhance the overall skill set the students will be utilizing in the work environment. Math courses include instruction about horsepower, and physics courses include instruction on hydraulics and electronics. The knowledge of English is a necessity since reading comprehension is an important component of the sixteen-week program. The result is students who possess an expansive applied education. They have the option to advance into a management position and the skills to succeed in it (Hitch, 2001, pp. 26-27). Businesses have seen their technical operations increase in complexity. Their quest to be effective and efficient ultimately relies on the skill level they want and expect in their employees. Schools that recognize and attempt to satisfy their shortfalls should address these concerns. Some companies, such as Caterpillar, do not feel that adequate preparation is available, so this organization takes matters into its own hands by designing, constructing, and administering a comprehensive in-house education program (Hitch, 2001, pp. 26-27).

Instructors of general education courses (math, science, English, social studies) and instructors of technical courses (welding, auto mechanics, auto collision repair,

electronics, electricity) have a different set of attitudes and perceptions of value. The general feeling projected by many individuals in each faction is these two areas remain separate for a reason. As a result, both sides show strong resistance to integrate these two divisions. Supporters on each side believe the two particular fields of study are not truly complementary in the realm of education. In an attempt to determine their feelings about the usefulness of the coursework areas, college students participated in a study. It showed that students placed a high level of importance on the general education courses they were taking. In addition, based on the study, they felt these classes contributed to competencies that apply to the occupational setting (Armistead & Vogler, 1987, p. 153).

A point of importance is any attempt to integrate technical courses with academic courses successfully involves a learner-centered approach. The goal should be flexibility for the student through a concentrated collection of courses that are problem based. This ambition would involve practical exercises such as role-playing or case studies that would show the learner the lesson focused on the problem at hand rather than on the academic discipline (Savoie & Hughes, 1994, p.54).

McHenry County College. McHenry County College in Crystal Lake, Illinois implemented this type of curriculum integration. In this application, a composite learning community course was the result of combining vocational courses and general education courses with internship work-site experiences. In this hybrid type of course, examples, issues, and assignments included subjects from both areas such as English Composition I and Automotive Electrical Systems I where students were able to correlate the materials (Tippens, 1998, p.48).

Holton. Governmental and private educational organizations have the responsibility of providing direction to educators and educational institutions. Additionally, individuals affiliated with the field of education have conducted meaningful research and have contributed to progress benefitting technical curricula throughout the years. Due to advancements in automotive powertrains and control mechanisms, curricula for technical education in this field must have a monitor to insure that the objectives and content are kept current. The ongoing goal of instructors and administrators needs to focus on a comprehensive range of learning experiences for the automotive technology student. Here, the definition offered by the German Education council specifies that it is, “the organized arrangement of learning processes and content with regard to certain aims and objectives which include techniques, behavior or type and degree of certain skills and aptitudes, or of knowledge” (Holton, 1995, p. 7).

Henschke’s Five Building Blocks. Henschke, further reiterates the learning experiences concept in his writings (1987) where he addresses the importance of instructors utilizing adult education in curricula such as those designed for automotive technology programs. He also emphasizes the need for instructors and people who train adult learners to possess an understanding and concern for their unique characteristics. Although courses and textbook material are in the design of the automobile technicians’ curricula, Henschke’s five important building blocks are necessary for an effective systematic training program. These building blocks are as follows:

- “1. Beliefs and notions about adult learners.
2. Perceptions concerning qualities of effective teachers.
3. Phases and sequences of the learning process.

4. Teaching tips and learning techniques.
5. Implementing the prepared plan.” (Henschke, 1987, pp. 415-419)

The first building block should serve as a starting point for automotive technology educators by insuring that the design of the program takes advantage of the student’s potential and his or her desire for an increasing level of interdependent self-direction. This responsibility occurs by insuring that he or she is building an increasing reservoir of experience as part of their growth and development (Henschke, 1987, pp.415-419).

The second building block continues the focus on educators in this field by specifying certain personal attributes necessary for them to apply to the curriculum. An interest in the students and in the subject needs to be apparent on the part of the instructor or trainer. This concern is important at the beginning of their studies in automotive technology and as they progress through the program. Although students in a technical program may feel motivated to learn if they sense that their academic welfare is of concern, the quality of the instruction faces a reduction if the presenter is unable to communicate the subject matter clearly. Unfortunately, most programs catering to adults do not require the educator or trainer to have experience in curriculum preparation or adult teaching (Henschke 1987, 415-419). Many educational institutions, which conduct adult education programs, do not have communication requirements for their teachers and consider knowledge of the subject matter to be sufficient. Since educators of automotive technology face instructional situations that require speaking, demonstrating, writing, and listening, it is critical to determine the communication style that will actively engage the students (Henschke, 1987, pp. 415-419).

The third building block emphasizes the need for automotive technology instructors to shift their focus from teaching effectively to facilitating learning in the curriculum. This building block covers the “Phases and sequences of the learning process” (Henschke, 1987, pp.415-419), and deals with the theory of how growth, development, and learning take place in a process of manageable steps that invite the involvement from the learner.

The fourth building block has the potential to complement the automotive repair technology curriculum with “Teaching tips and learning techniques” (Henschke, 1987, pp.415-419) for the instructor or trainer in this field. In the interest of the student, the educator should explore the kinds of techniques, which are available to him or her, in order to facilitate learning and to decide which would be the most appropriate. The lecture is primarily one-way communication that limits the opportunity for interaction with the students, so alternative techniques to disseminate knowledge are vital. Videos and demonstrations combine visual with verbal lessons. Case studies, simulations, and group discussions challenge the learners to analyze a problem or situation and use their knowledge and skills toward a resolution. Rather than simply giving answers or information to students and risking their disregard of important material, the learners’ involvement with it offers more of an opportunity for practical application that is more likely to facilitate retention.

The fifth building block, which can enhance an automotive technology repair curriculum through quality instruction, is “Implementing the prepared plan” (Henschke, 1987, pp. 415-419). It requires the educators to bring their plans to fruition and get the students actively involved. Henschke states that this building block is the most crucial

element in this process and that a positive attitude, in many aspects, is extremely important to maintain throughout the development (1987).

University of Wisconsin-Stout. Fortunately, some postsecondary educational institutions have taken the issues of curriculum integration and employers' needs seriously. The University of Wisconsin-Stout (UW-Stout), which is Wisconsin's polytechnic university, has developed an articulation agreement that benefits students and employers. The design of the Bachelor of Science in Industrial Management (BSIM) is an advancement of the skills for technical professionals who will have an increasing level of management issues placed before them. UW-Stout allows for up to 40 technical credits from the Wisconsin Technical College System to transfer toward the BSIM. This program offers both managerial and technical principles, and the graduates receive preparation to recognize and to apply their education to issues they will confront in their industry's environment (Dittman, 2008, pp.32-35). The efforts by this institution to address the problem of technical-academic integration need duplication throughout the United States for the benefit and the enrichment of technical education.

New Car Dealers, Independent and Franchised Establishments. New car dealers' service departments as well as other employers need qualified automobile repair technicians. Independent and franchised (Firestone, Meineke, MAACO, CARSTAR, AAMCO, Midas) automobile repair establishments actually outnumber these dealership service departments and often have a need for a higher level of skill from their technicians due to the variety of makes and models they service on a regular basis. Additionally, various governmental entities at the local, state, and federal levels organize

their operations to include an in-house department or facility that handles the preventative maintenance and repair requirements for their own fleet of vehicles.

WorkKeys. WorkKeys, the foundation of the National Career Readiness Certificate, is a job skill assessment system that helps employers select, hire, train, develop, and retain a high-performance workforce. It is a system for identifying employability skills. Its website is: www.act.org/workkeys. (ACT, 2010).

The national WorkKeys research tools indicate what is required in the following competencies at the various levels:

- Applied Mathematics
- Workplace Observation
- Applied Technology
- Locating Information

An important resource I used is the Occupational Information Network (O*Net).

The United States Department of Labor developed the Dictionary of Occupational Titles (DOT) in the late 1930s and periodically updated it. The department expanded the contents from matching jobs with workers to providing labor market information services (Labor, 2003). The O*Net system uses common language and terminology to describe occupational requirements and replaces the Dictionary of Occupational Titles with current information that can be easily accessible online (United States Department of Labor, 2010). This research focuses on three primary positions that are sub-classifications of the automobile technician category. These three sub-classifications are as follows: automotive body repairers (Occupational Information Network, 2006a), automotive

master mechanics (Occupational Information Network, 2006b), and automotive specialty technicians (Occupational Information Network, 2006c).

The characteristics of these sub-classifications include the following: tasks, knowledge, skills, abilities, work activities, work context, interests, and work values. O*Net specifies several individual aspects of each of these characteristics and links to WorkKeys (Occupational Information Network, 2006). “WorkKeys is a job skills assessment system that helps employers select, hire, train, develop, and retain a high performance workforce” (ACT, 2010, p.1). WorkKeys operates within the Workforce Development Division of the ACT Corporation based in Iowa City, Iowa which is a not-for-profit organization founded in 1959. In 2007, ACT added the WorkKeys Personal Skills Assessments division (ACT, 2009). O*Net provides the United States Department of Labor classification for each occupation being researched (ACT, 2008). WorkKeys defines the occupational profiles by level of skill assessments on a joint website (ACT, 2012). Skill assessments that apply to the four sub-classifications are Applied Mathematics, Locating Information, Workplace Observation, and Applied Technology. These assessment levels vary slightly according to the three sub-classifications in the automobile technician category involved in the research (ACT, 2010).

WorkKeys provides several benefits to the employer of automobile technicians. It assists in the area of job profiling by identifying the skills required for a job, provides assessments that show the current skill levels of students, and identifies training or courses that students need to correct skill level deficiencies. For example, the automotive specialty technician must possess skills included in the WorkKeys Level Four assessment area of Applied Mathematics (ACT, 2010). Competency at this level requires the ability

automotive specialty to multiply a mixed number by a whole number or a decimal. This requisite indicates that automotive technology coursework should address this necessity and should include it in the program of study.

The curricula obtained from the Associate of Applied Science Automotive Technology degree programs at the colleges I researched all have a mathematics course requirement. After I broke down the Level Three Skills and Level Four Skills, which are the employability competency levels specified for automotive occupations in the Applied Mathematics skill area of the WorkKeys Occupational Profiles, I compared them to the mathematics courses specified in the related curricula (ACT, 2010, p. 1). My evaluation concluded that the students met the vast majority of the skills with the completion of a technical or industrial math course provided it included algebraic concepts. In most cases, competency in algebra or the fulfillment of coursework in this specific area is a prerequisite. A table of contents published in a widely used introductory algebra college level textbook exemplifies the need for this course content. This specific table includes algebraic concepts such as variables, equations, exponents, order of operations, applications, inequalities, integers, monomials, and polynomials. This table of contents is found in Appendix C of this research document (Lial, Hornsby, McGinnis, 2009).

An example of a Level Three Skill is the ability to change a decimal form to a percent form. An automotive technology student meets the competency of one Level Four Skill when he or she puts information in the right order before performing calculations (ACT, 2010, p. 1). In contrast, I discovered one skill not specifically addressed in the colleges' course curricula. This skill is the simple conversion of time units such as hours to minutes and minutes to seconds. Although the post-secondary

educator is likely to assume that students mastered this skill during the elementary education years, it is a critical one specified in the WorkKeys competencies. This deficiency is one colleges need to consider correcting in the mathematics area of their curricula.

Based upon the similarities in the course descriptions from the aggregate list of academic classes provided by the 19 institutions, they could possibly consolidate the following technically-oriented mathematics courses into the category of Technical Mathematics: Applied Mathematics, Industrial Mathematics, Vocational Technical Mathematics, and Applied Shop Computations. Elementary and intermediate are the two levels of algebra included in college curricula. These two course areas focus on mathematical concepts that include WorkKeys skills of adding, subtracting and multiplying negative numbers. The course of Business Mathematics appears in curricula and addresses the WorkKeys skills in Level Three and in Level Four. An example of one Level Three proficiency is the computation of whole numbers, and solving problems that require two operations is one Level Four proficiency (ACT, 2010, p. 1). Additionally, this course area also provides applications geared toward the internal operations of a business that employs automobile technicians. An example of a lesson in this area includes the coverage of banking operations. I summarized and condensed the mathematics courses offered by the colleges and noted three main categories: Technical Mathematics, Algebra, and Business Mathematics.

The employability competencies in the WorkKeys Occupational Profiles are in the Level Three and Level Four skills of the Applied Technology category (ACT, 2010, p. 1). The academic courses that colleges offer should contribute to these two skill levels.

I assessed the competencies specified in Level Three and the competencies in Level Four. Then, I examined courses in the curricula of the 19 Illinois and Missouri colleges I researched. A Level Three competency that is essential to automobile technicians' skills is the ability to apply basic principles to solve problems involving a simple system (ACT, 2010, p. 1). One example of courses, which address this skill area, is any that requires a critical thinking process such as Principles of Management, Introduction to Business, and Principles of Supervision. Thorough application of the concepts covered in the three previously mentioned courses will also develop the following Level Three skills: identifying the clear physical symptom that points to the potential source of a problem and identifying the best solution after eliminating clearly unsuitable possibilities (ACT, 2010, p. 1). The Level Four skills in the area of Applied Technology require competencies that dictate higher level challenges. Some of these capabilities are the ability to apply less obvious basic principles to solve problems within physical systems, the ability to eliminate physical symptoms that do not point to the source of a problem and disregard extraneous information, and the ability to identify the best solution after the elimination of other unsuitable possibilities (ACT, 2010, p. 1). Students exercise the capacity to think critically and to process technical data in various courses in the business and human relations category. These courses include Bookkeeping, Accounting, Career Management, Introduction to Business, Management, and Principles of Supervision.

Another competency specified in the Level Four skills in the area of Applied Technology is to understand the operation of diagnostic equipment (ACT, 2010, p. 1). In the automotive technical environment, diagnostics that are more complex interface with

computer applications. This knowledge necessitates computer-related coursework in an automotive technology program that will enable the student to understand moderately complex electrical and electronic systems in vehicles. Sufficient comprehension of diagnostics and computer-related equipment can also contribute to the required Level Four skill of identifying the best solutions after eliminating other unsuitable possibilities (ACT, 2010, p. 1). The emphasis must be on actual applications to the field of automotive technology for the lesson to have relevance. This understanding will also result in the technician's ability to fulfill the Level Four competency of solving moderately complex technical problems (ACT, 2010, p. 1).

The Locating Information category of the WorkKeys Foundation Skills specifies proficiency in Level Three and in Level Four. These levels stipulate the importance of mastering the ability to find information in a graphic and to fill in information that is missing in a graphic (ACT, 2010, p. 1). Academic course areas that contribute to graphics interpretation include history. Timelines exhibit a sequence of past events. Computer software applications such as EXCEL assist the user by aligning numerical values in a graphic format. In its performance objectives for chapter twenty-one, the *Contemporary Mathematics for Business and Consumers*, Robert Brechner, 6th edition, 2012, textbook covers data interpretation and presentation. Topics in this area include the aptitude to read and to interpret information from a table, to read and to construct a line chart, to read and to construct a bar chart, and to read and to construct a pie chart (Brechner, 2012, p.717).

The WorkKeys Occupational Profile of the Automobile Master Mechanic title on O*Net provides a list of attributes that applies to the specific definition of the position.

O*Net provides the United States Department of Labor classification for each occupational profile by proficiency level assessments on a joint website. The nine attributes of this specific occupation are tasks, skills, knowledge, abilities, work context, work activities, work values, crosswalks, and interests (Occupational Information Network, 2006b , p.1). These attributes are elaborated on in a very detailed process throughout the O*Net classification of the position. After I assembled the data and associated the research questions with the interview questions, I discovered three additional WorkKeys employability skill assessments. They were Reading for Information, Teamwork, and Writing (ACT, 2012). These assessments identify characteristics and skills at designated levels required of the automobile repair technician according to WorkKeys.

State of California Department of Transportation. The most comprehensive example I found for the requirements of this type of position came from the State of California. The Department of Transportation lists its expected qualifications for candidates for the position of *Automobile Mechanic* that align with attributes detailed by O*Net such as the task of, “Examines vehicles and discusses extent of damage or malfunction with the customer, “and the specified skill, “Identifying the nature of problems” (Automotive Master Mechanic, 2006, pp. 1, 3). The human resources bulletin advertising for the position narrows the attributes down to nine specific abilities as follows:

- 1) Operate machine tools used in automotive repair and do welding and brazing
- 2) Inspect automotive equipment, locate defects, and estimate the cost of repairs
- 3) Read, interpret, and work from plans, drawings, and specifications

- 4) Requisition and store a supply of automotive parts
- 5) Keep records and make reports
- 6) Instruct and supervise unskilled assistants
- 7) Follow oral and written directions
- 8) Analyze situations accurately and take effective action
- 9) Read and write at a level appropriate to the classification (California Department of Transportation, 2006, p. 2)

It is important to note that of the nine abilities listed in the job bulletin, only number one was a predominately hands-on requirement. Numbers two through nine emphasized the need to mathematically estimate, read, interpret, analyze, and understand plans, drawings, and specifications. Today, oral as well as written communication strengths are also key necessities. This requirement even applies to someone in a position primarily involving independent repair projects. While these qualifications are the ones an employer is seeking in the ideal candidate, the education that a postsecondary technical institution is offering through its comprehensive automobile repair technology curriculum is relevant information to examine.

Kishwaukee College. The program bulletin of Kishwaukee College in Malta, Illinois states these details about its basic Automobile Mechanics Technology I course, “In addition to hands-on work, students will be required to use a text for reading, writing, and computers for online assignments. They will be using some algebra concepts and measurements in both the English and the Metric systems. They should be able to follow multiple-step directions and work both independently and in team situations” (Kishwaukee College, 2008, p.1).

J.F. Drake State Technical College. J.F. Drake State Technical College in Huntsville, Alabama emphasizes the growth of technology in the field of automobile repair even more. Its program description particularizes the need for theoretical knowledge in combination with practical experience in order to give its students the necessary scope of occupational skills required for success. As the level of technology in automobiles becomes increasingly sophisticated, the automobile repair technician must use computerized shop equipment to diagnose problems that might occur with a vehicle's vast array of electronic components. This technical college accentuates the comprehensive set of skills needed in their flier provided to prospective students. It communicates that this ability is an essential complementary element of its Automotive Mechanics Technology Program, as stated in the following paragraph, "Successful Automotive Technicians must possess strong communication and analytical skills, the ability to read and interpret service manuals, an interest in keeping abreast of new technology and a special desire to learn new service and repair procedures" (Drake State Technical College, 2009).

Summary of Literature Review

Chapter Two provided a background of the literature and elaborated on the skills needed of automobile repair technicians in the 21st century. Although students initially acquired skills through informal education methods, the progression of technology has required technical education to advance from industrial arts to career technical education. Additionally, formal academic education coursework is necessary to complement the technically-specific courses because together they provide the curriculum required that meets the needs of this occupational field. Both the public and the private sector have

provided models of integrating these two areas of learning. Examples of this application include accomplishments made by the Caterpillar Company, McHenry County College, the University of Wisconsin, the State of California Department of Transportation, Kishwaukee College, and J.F. Drake State Technical College.

The application of WorkKeys, the foundation of the National Career Readiness Certificate, is a job skill assessment system that helps employers select, hire, train, develop, and retain a high-performance workforce. As a system for identifying employability skills, WorkKeys research tools benefit organizations by specifying that the competencies of Applied Mathematics, Workplace Observation, Applied Technology, and Locating Information are present at various levels for the three categories of automobile repair technicians researched. These were automotive body and related repairers, automotive master mechanics, and automotive specialty technicians.

Knowledgeable individuals in both the public and the private sectors have recognized the need for more in-depth overall technical education for over a century. Prentice stated that programs and experiences are essential to bridge the gap between academic courses and technical courses (2001, p. 80). Henschke (1987) addresses the importance of instructors utilizing adult education in curricula such as those designed for automotive technology programs. Increased levels of technology in automobiles of the 21st century and beyond will demand increased skill levels in the technicians who repair them. Colleges, as well as employers, have instituted coursework and even programs that address this need. The demands of this trend will require increased levels of participation on the part of both the employers and the educators in the areas of automobile repair technology. The intended result needs to be comprehensive efforts that complement the

integration of academic and technical education rather than separate these two areas of the curricula. Because of this observation, I decided to conduct an in-depth study of the skills required of automobile repair technicians and analyze how formal academic coursework contributed to the knowledge required to be effective in their positions.

All of the automobile repair technology curricula I obtained from the 19 colleges focus on providing the coursework required to complete the program during an average time period of two years. The type of learning the student acquires is career technical education because the coursework emphasizes training the student to acquire skills that will enhance his or her employability as a technician in the workforce (Alfeld et al., 2006, p.2). Although this type of education does not exclude the recent high school graduate, it has a strong appeal to the nontraditional adult learner who wants to be trained for a career in the shortest amount of time possible. The Associate of Applied Science degree accomplishes this educational goal in two years compared to the normal time frame of four years for a bachelor's degree.

Chapter Three: Methodology

In this chapter I will provide research questions that address the perceived educational needs automobile repair technicians have and to what level do academic skills satisfy these needs. I will also list five specific interview questions that I will use to obtain qualitative data from employer representatives who supervise the technicians. I will incorporate relationships between specific research questions and interview questions to detail how they complement each other. The methods I will use to accomplish this research involve identifying the academic courses included within the postsecondary level programs the technicians enroll in and communicating with the employers who rely on expected proficiencies required to operate their service departments. Additionally, I will compare and relate the educational institutions' offerings and the automobile repair organizations' needs to research conducted by WorkKeys which established standards required in academic-related aptitude levels necessary for employee competence. Lastly, I will indicate where interdependent relationships can occur within these three parties involved in this research project.

Research Questions

The primary objective of this project was to relate to the need and importance of academic skills, obtained through general education coursework, to the effectiveness and efficiency of the automobile repair technician's expertise in his or her employment. The research questions for this study were as follows:

RQ1: What educational needs, if any, do employers perceive their automobile repair technicians require for an improved training program?

RQ2: How important is it for the employee in the automotive repair (physical and mechanical repair to cars and light trucks) profession to have more than a technically-specific education in order to be thoroughly effective for his or her employers?

RQ3: What, if any, academic skills are lacking?

In order to answer these questions, I used the following procedure in this study. First, I communicated with 35 diversely selected and cooperative employers from the bi-state (Missouri and Illinois) area. This selection was arbitrary, and I obtained it from the Yellow Pages of this region. I accomplished this contact through a personal visit to their locations at which time I informed them of the purpose of my study. In addition, I performed an interview with the appropriate supervisor or manager.

Secondly, I obtained the degree requirements for the automobile repair technology programs of 19 regional postsecondary institutions with the intent of analyzing their contents that are available publicly online.

Thirdly, I listed and assessed the employee requirements that the employers conveyed to me. These requirements addressed the needs that enable the technician to perform the necessary repairs effectively and efficiently that the employers commit to their customers.

Next, I noted the objectives of the academic courses included in the technical programs. These objectives included the ability to communicate proficiently both verbally and in writing as well as the ability to arrive at conclusions through a critical thinking process.

Then, I compared the employers' needs with the educational institutions' offerings to determine if and where there was a mismatch between the two entities. I judged and analyzed these findings in accordance with what the national WorkKeys research tools indicated required in the following competencies at the various levels:

- Applied Mathematics
- Workplace Observation
- Applied Technology
- Locating Information

WorkKeys, the foundation of the National Career Readiness Certificate, is a job skill assessment system that helps employers select, hire, train, develop, and retain a high-performance workforce. Its website is: www.act.org/workkeys. (ACT, 2010).

WorkKeys did an elaborate job of identifying the various employability skills needed. They obtained information from the Dictionary of Occupational Titles as well as from individuals who are employed in those occupations. I utilized the material obtained from this source to analyze the present inclusions and needs. Lastly, I will offer my evaluative findings derived from my queries with the employers to the educational institutions.

Interview Questions

I used the following five questions and personally posed them to each of the automobile technician supervisors. I derived them from the previously listed research questions.

1. What presently does your workforce do well---as far as their work is concerned?

2. What do they not do well?
3. What do you wish your employees could do or know---that they presently can not do or do not know?
4. If you could suggest something the individual employee could learn that would benefit them and your organization, what would it be?
5. After reviewing the list of courses required from the colleges, what are your thoughts?

The focus of the interview questions was to incorporate the intent of the research questions as they apply to the importance of academic courses contributing to the skills necessary for automobile repair technicians in the 21st century. The specific relationships between the two categories of questions are as follows:

Interview Question Number Four and Interview Question Number Five relate to Research Question Number One; Interview Question Number One and Interview Question Number Five relate to Research Question Number Two; and Interview Question Number Two and Interview Question Number Three relate to Research Question Number Three. I detailed the specific elements of the relationships of the research questions to the interview questions in Chapter Four of this dissertation. I also detailed the relationships of the research questions to the interview questions on Table 10 in Appendix D.

I obtained data tables from 19 different postsecondary institutions in the Illinois and Missouri area that offer an Associate of Applied Science Degree in automotive technology. These institutions are listed on the following page as well as in Appendix D, Table 2.

Table 1***Educational Institutions***

NAME	ABBREVIATION	LOCATION
Crowder College	CC	Neosho, MO
East Central College	ECC	Union, MO
Frontier Community College	FCC	Fairfield, IL
Jefferson College	JEFFCO	Hillsboro, MO
John A. Logan College	JALC	Carterville, IL
Kaskaskia College	KC	Centralia, IL
Lake Land College	LLC	Mattoon, IL
Lewis & Clark Community College	LCCC	Godfrey, IL
Lincoln Land Community College	LLCC	Springfield, IL
Metropolitan Community College	MCCCKC	Kansas City, MO
Mineral Area	MAC	Park Hills, MO
Ozark Technical Community College	OTC	Springfield, MO
Parkland College	PC	Champaign, IL
Ranken Technical College	RTC	St. Louis, MO
Rend Lake College	RLC	Ina, IL
St. Louis Community College	STLCC	St. Louis, MO
Shawnee Community College	SCC	Metropolis, IL
Southwestern Illinois College	SWIC	Belleville, IL
State Fair Community College	SFCC	Sedalia, MO

WorkKeys

I judged and analyzed these findings in accordance with what the national *WorkKeys* research tools require in the following competencies at the various levels:

- Applied Mathematics
- Workplace Observation
- Applied Technology
- Locating Information (ACT, 2010).

Sociology coursework provides lessons in graphic presentation and interpretation through the display of demographic representations. An understanding of the demography in the area of the technician's employer can provide him or her with insight regarding service desired. A wealthy and elderly customer may be receptive to a complete maintenance visit that would cost several hundred dollars whereas one who is in a lower income bracket may only want a minimum service package.

Political science courses identify trends that occur in the administration of public affairs and the changing practices of the federal, state, and local governments. Printed material often effectively displays straightforward graphics. Technicians need qualifications in summarizing information, identifying trends, and comparing information and trends because these are essential elements in both verbal and written message formats. Colleges that recognize the importance of the technician being adept in multiple facets of correspondence specify the inclusion of English composition and oral communication courses in their automotive technology programs. Some of them designed courses such as *Writing for Industry* and *Technical Writing* for their curricula. Technicians perform report writing on forms and on the computer. As a result, technical

students require computer-related coursework that will fully prepare them for the documenting and reporting responsibilities expected of them. Specific course titles that would be applicable to their field are the following: Computer Applications for Technicians and Introduction to Online Learning.

The automotive technician must master areas of the WorkKeys Workplace Observation Skills. While there are five levels in this section of the WorkKeys Occupational Profiles, the automotive career fields demand proficiency in the highest Level Four and Level Five categories (ACT, 2010, pp. 1-2). In summation, this is the framework WorkKeys provides in their extensive research and accentuates employability skills. Training or instructional materials can address these skills through curriculum design of automotive technology programs. Colleges should evaluate the coursework of their automotive technology programs by their content to determine if it contributes to mastery of skills at the specified levels. The Level Four characteristics of Workplace Observation focus on analyzing the observed and specifies, “Test-takers will need to make inferences, anticipate outcomes, and/or extrapolate information from an observed demonstration, procedure, or process” (ACT, 2010, p.1). WorkKeys elaborates on these characteristics by specifying the student master the following skills to achieve proficiency at Level Four:

- Make inferences from a demonstrated process or procedure
- Deduce which conditions apply to a new situation
- Determine the general principle(s) underlying a condition, process, or procedure
- Apply complicated instructions to new situations (ACT, 2010, p. 1).

But, for the purpose of analyzing, I investigated the required skills and the contribution of the academic coursework to the overall level of competence expected of the technician.

Mathematical computations, learned in a standard mathematics course, play a critical role in precise mechanical tolerances and adjustments in the automobile shop environment, but a business mathematics course provides insight toward the internal operations of a business that employs automobile technicians. An example of value achieved in the internal environment from this competency is the capacity of the technician to assist the organization with its banking operations. The completion of courses in the areas of bookkeeping, accounting, and finance would enhance the technicians' ability to understand the financial responsibilities of their affiliated organizations. This comprehension supports the ability to extrapolate information pertaining to cost analysis figures and to make inferences that relate to their involvement in budgets or profit margins.

The technician, who has an interest in advancing himself or herself to become a supervisor or a business owner, must develop proficiency in the WorkKeys Level Five category of Workplace Observation titled Evaluating the Observed (ACT, 2010). Its characteristics specify "Test-takers will evaluate which alternative is best based on a previous observation and make evaluative judgments about what has been observed" (ACT, 2010, p.1). These characteristics specify the need to master the following skills:

- Evaluate whether something is or is not a distraction (relevance)
- In a context where information is not complete and when presented with a new situation, able to judge the best course of action
- Make predictions, test hypotheses

- Consider the implications of a process or procedure
- Prioritize and apply principles to reach desired outcome. (ACT, 2010, pp. 1-2)

A key required element of this mastery is to ascertain if there is relevance by determining if something is a distraction. An introductory psychology course would be relevant to this area because the human mind and behavior play a role in the technician's evaluation. Business applications necessitate an understanding of economics because there is a supply and demand for both the services the technician provides and the goods that are part of his or her profession. As the technician progresses in Level Five, a career management course can provide direction when confronted with a new course of action. Coursework that is more demanding and involves critical thinking can facilitate the actions of making predictions, testing hypotheses, and considering the implications of a process or procedure. The ability to reach a desired outcome will depend on the technician's competence in prioritizing and in applying principles. The following course areas introduce and reinforce these principles: management, entrepreneurship, and supervision.

Physical science concepts play a vital role in Level Five Workplace Observation skills because the technician may face the challenge of judging a new course of action where information is not complete or when presented with a vehicle that requires repair. An understanding of the laws of physics can provide enlightenment if the implications of the process or procedure are given the proper consideration. An understanding of the fundamentals of chemistry and environmental technology can also guide the technician to prioritize principles and to apply principles that will enable him or her to reach the desired outcome.

Other courses that do not apply directly to any WorkKeys competency specified for automotive technicians are in the various curricula of the colleges researched. They provide familiarization for the student to new areas and emphasize the importance of personal safety and health maintenance. Some specific courses are as follows: College Orientation, Foundation Seminar Success Skills (College Transition), Job Search Success, Preparation for Employment, First Aid, Introduction to Environmental Health and Safety, Lifetime Wellness, Responding to Emergencies, and Health Education.

Additional Employability Skill Assessments

After I gathered my initial data and established my research structure, I discovered that WorkKeys expanded the requirements for the automobile repair technician categories to include three additional relevant employability skill assessments. These were Reading for Information, Teamwork, and Writing. In my initial analysis of the data I obtained from the interviews in my study, I was not particularly looking for these three assessments. But, I discovered desired competencies that related to their characteristics and skills.

Reading for information. The applicable WorkKeys characteristics and skills for this employability assessment, as it related to the automobile repair technician categories research, pertained to Level Three and Level Four (ACT, 2012, p. 1). Specific characteristics of this assessment in Level Three were “reading materials are short and simple with no extra information,” and “reading materials tell readers what they should do,” (ACT, 2012, p. 1). Interview Question Number Three considered these characteristics and skills by asking the employer representative, “What do you wish your employees could do or know---that they presently cannot do or do not know?”

Teamwork. In its Teamwork employability assessment, WorkKeys requires the automobile technician categories I researched to function at Level Three and Level Four in its measure of characteristics and skills (ACT 2012, p. 1). Level Four in the assessment emphasizes this characteristic by specifying that the technician should be capable of understanding reading materials describing procedures that involve several steps. This characteristic corresponds to the skill denoting that he or she be able to “apply instructions with several steps to a situation that is the same as the situation in the reading materials” (ACT, 2012, p. 1). My Interview Question Number Four signified advantages obtainable through teamwork between the worker and the manager. It inquired, “If you could suggest something the individual employee could learn that would benefit them and your organization, what would it be?”

Writing. Interview Question Number One asked, “What presently does your workforce do well---as far as their work is concerned?” It considered the inclusion of Writing as a necessary WorkKeys employability assessment for the automobile repair technicians categories I researched. This question sought to determine if the characteristics of the assessment were present in the employees’ set of skills, whereas my Interview Question Number Two sought to discover if a deficiency existed in the area by inquiring, “What do they not do well?” WorkKeys considers this assessment to possess only a moderate level of importance by addressing characteristics at Level Two and Level Three. A critical Level Two Writing characteristic postulates that “casual language or slang may be used rather than standard business English”, whereas a Level Three characteristic stipulates, “the language may be more casual than standard business English but never contains slang or is rude” (ACT, 2012, p.1).

This project merited accomplishment because it investigated the skill set employers are requiring in the field of automobile repair technology. Armed with this information, the technical colleges and departments researched will be able to compare these requirements with their offerings. The intended result will be the student possessing mastery of his or her occupation through the means of a more comprehensive program that the providing educational institutions will realize and will deliver.

I anticipated, at the very least, a moderate reception from both the employers and the schools since the analysis and the conclusion of my research will be likely to benefit them. I organized the data in a systematic way that enabled me to interpret and to apply it in both specific and general categories. I offered my findings in a dissertation to the employer representatives I interviewed. At the selected schools, I also reviewed the courses that comprised the automobile repair technology programs offered. Although I obtained the sample from the region of the United States where I reside, I expect it to be a transferable representation to other parts of the country. The limitations I face will be the unpredictable developing technology that will appear in future models of cars and light trucks.

Summary

A qualitative study of the relationship of academic courses to the skills required of automobile repair technicians provided the opportunity to discover and to analyze issues that surround the needs of the employers and the challenges that technical educators face. Through my research, I investigated the deficiencies that existed with the intent to provide alternative solutions in order to enrich the operations of both groups.

Chapter Four: Results

In the previous chapter of this dissertation I described the methodology. In this chapter I reported the results of the research that delved into the need for automobile repair technicians to possess a skill set that extends beyond the hands-on aspect of the profession. The members of this profession are the men and the women who work on the mechanical, electrical, and electronic elements of cars and light trucks. This occupational category also includes those who perform structural or physical reconditioning to these vehicles for the purpose of restoration or correction due to collision. I accomplished this inquiry by conducting a qualitative study. For my analysis, I gathered both primary and secondary data that focused on the knowledge, skills, and abilities employers of automobile repair technicians are seeking and the coursework schools are providing in their curricula. Upon completion of the accumulation process, I presented the data gathered from the research questions and the interview questions that comprised the basis for the study.

Purpose of the Study

I planned this study with the intention of relating the need and the importance of academic skills (obtained through general education coursework) to the effectiveness and efficiency of the automobile repair technician's expertise in his or her field of employment. An example of this deficiency would be the need for a technician to complete repair estimates or repair reports viewed by the supervisor or the customer. The academic skills, achieved through the completion of an English Composition course, potentially satisfy this inadequacy.

My purpose to accomplish this study was to examine the direct and the indirect relationships of academic courses to the skills of automobile repair technicians. I obtained this information by getting copies of curricula (the set of courses and their descriptions) from colleges and departments and comparing this material with data from employers who provided information that focused on the current level of employee performance and desired improvements facilitated through a more comprehensive technical education. The ever-increasing level of technology in the automotive repair industry requires up-to-date technical education to satisfy the employer's occupational needs.

In a perfect world, the technical schools would provide a comprehensive automobile repair technology education. Secondly, the students enrolling in the programs would acquire the full gamut of knowledge qualifying them to become competent technicians in these occupational fields. Finally, the employers who need their skills would have success in staffing their organizations with the quality and quantity of employees they seek. Since the three entities: schools, students, and employers do not continuously meet this level of satisfaction, my objective was to gather primary data through the means of personal interviews. My intention involved acquiring applicable information through arranged interviews with research participants. They included supervisory personnel at 35 automobile repair establishments. I was the individual doing the interviewing and, with all interviewees who provided consent, the tape-recording of the conversations. I completed this process to ensure comprehensive coverage of the communication and the areas of emphasis. The data focused on the automobile repair technicians who have found work in their field. The critical subject of investigation for

the employers was to center on the comprehensive skill set that they gauge as vital in order for the automobile repair technician to be both effective and efficient in his or her duties. For the technical schools and departments, the issue was whether they are or are not offering a curriculum that is satisfying the current and future occupational demands of the employers.

My study merited accomplishing because it has the potential to lead to increased student mastery of his or her occupation. Information regarding this may be helpful in changing and improving the ability to accomplish this goal through the means of an improved program when the providing educational institutions understand and deliver it. This increased skill level has the potential to transcend into higher productivity for the employer and decreased repair expenses for the owner of the vehicle that is in for repair. A situation of this type could materialize if an automobile repair technician with advanced critical thinking skills was able to accurately and expeditiously diagnose and repair a vehicle.

An owner of an automobile repair establishment conveyed to me an example of advanced computer knowledge that applied to a proper repair technique. One of his customers brought his automobile to the shop because it was not running smoothly, and the “check engine” light was on. This problem required the repair establishment to purchase software from the automobile manufacturer and download it to the shop computer. The technician then transferred the software upgrade to the customer’s vehicle through its computer portal under the instrument panel. Following the completion of the software transfer, the “check engine” light went off, and the automobile functioned properly. The remarkable aspect of this repair experience is that it occurred by using

modern technology and diagnostic applications. The technician performed the analysis and repair of the vehicle through computer interaction without raising the hood.

This more efficient process would contrast with the less-knowledgeable technician who repaired the vehicle through a process of elimination that required additional and unnecessary parts and labor to the customer.

Although the managers at automobile repair facilities have the ethical option to absorb unnecessary parts and labor expenses, they realize that it will decrease their profit margin. By employing technicians in the workforce who possess the skills to effectively and efficiently diagnose and repair an automobile, employers minimize the potential for a misdiagnosis to occur. The ever-increasing level of technology that is appearing in vehicles in the 21st century will require not only initial, but also ongoing education in this field from the automobile technology repair programs offered at postsecondary educational institutions.

Presentation of Data

The research questions for this study were as follows:

RQ1: What educational needs, if any, do employers perceive their automobile repair technicians require for an improved training program?

RQ2: How important is it for the employee in the automotive repair (physical and mechanical repair to cars and light trucks) profession to have more than a technically-specific education in order to be thoroughly effective for his or her employers?

RQ3: What, if any, academic skills are lacking?

These research questions formed the basis for determining the following interview questions.

1. What presently does your workforce do well---as far as their work is concerned?
2. What do they not do well?
3. What do you wish your employees could do or know---that they presently can not do or do not know?
4. If you could suggest something the individual employee could learn that would benefit them and your organization, what would it be?
5. After reviewing the list of courses required from the colleges, what are your thoughts?

Relationship of Research Questions to Interview Questions [Table 10, page 326]

Interview Question Number Four and Interview Question Number Five are related to Research Question Number One which asked, “What educational needs, if any, do employers perceive their automobile technicians require for an improved training program?” Interview Question Number Four was, “If you could suggest something the individual employee could learn that would benefit them and your organization, what would it be?” Interview Question Number Five was, “After reviewing the list of courses required from the colleges, what are your thoughts?” The data for this area of research partially came from the replies to Interview Question Number Four which asked the employer representative to suggest something the automobile technician could learn that would benefit both the employee and the organization. Interview Question Number Four focused on acquiring categories of desired knowledge for the automobile repair

technicians. It accomplished this search by seeking feedback from the employer representatives after they viewed the list of academic courses comprised from the curricula of the 19 colleges whose associate degree programs in automotive technology were part of the research.

Interview Question Number One and Interview Question Number Five relate to Research Question Number Two which asked, "How important is it for the employee in the automotive repair (physical and mechanical repair to cars and light trucks) profession to have more than a technically-specific education in order to be thoroughly effective for his or her employers?" Interview Question Number One initiated the inquiry by asking the employer representative, "What presently does your workforce do well---as far as their work is concerned?" Interview Question Number Five followed up by presenting the employer representatives with a composite list of the academic courses contained in the curricula of the Associate of Applied Science degree programs in automobile repair technology at the 19 colleges and asking them, "After reviewing the list of courses required from the colleges, what are your thoughts?" Interview Question Number One directed attention to the current level of employee performance at the automobile repair establishments. The focus was on the positive attributes the technicians possess to execute effective and efficient repair procedures. Interview Question Number Five complements Interview Question Number One because it seeks the justification for academic courses to be included in an automobile repair technology curriculum.

Interview Question Number Two and Interview Question Number Three are related to Research Question Number Three which asked, "What, if any, academic skills are lacking?" This research question sought to determine what, if any, academic skills

were lacking in the background of automobile repair technicians in the workforce. It began the analysis with a basic probe for data relating directly to the technicians' skill level. I undertook this probe with Interview Question Number Two which addressed the basic issue of their performance deficiencies by asking the employer representatives, "What do they not do well?" The data gleaned from these responses required further clarification with an additional interview question that focused on the desired knowledge and skills of the automobile repair technician. This request materialized with Interview Question Number Three, "What do you wish your employees could do or know---that they presently cannot do or do not know?"

Research Question Number One. Research Question Number One was, "What educational needs, if any, do employers perceive their automobile technicians require for an improved training program?" Interview Question Number Four and Interview Question Number Five represented Research Question Number One. Interview Question Number Four was, "If you could suggest something the individual employee could learn that would benefit them and your organization, what would it be?" Interview Question Number Five was, "After reviewing the list of courses required from the colleges, what are your thoughts?" This research question asked if the employers perceived that their automobile repair technicians required additional education for an improved training program. The data for this area of research partially came from the replies to Interview Question Number Four which asked the employer representative to suggest something the automobile technician could learn that would benefit both the employee and the organization.

Interview Question Number Four. To arrange this data, I initially transcribed the full interview with each of the 35 management representatives from an audiotaped-recording. I then extracted material from all 35 interviews that pertained to each of the five interview questions. Some of the responses consisted of only a few words while others involved multiple sentences. I then categorized the responses conveyed to me by the interviewees according to the subject or issue. I ranked the categories in numerical order according to the number of responses each received..

Interview Question Number Four focused on acquiring categories of desired knowledge for the automobile repair technicians by asking the management representatives the specific question, “If you could suggest something the individual employee could learn that would benefit him or her and your organization, what would it be?” The response of each interviewee is in his or her exact words. I established categories based on the number of responses I received from them. These responses represent input from 35 interviewees who identified specific skill sets they felt were important for their technicians to have in their educational and training background. The ranked categories and the number of responses to Interview Question Number Four that each category received were as follows:

Category

1. Employees need training to correspond to new technology in vehicles. (10 responses)

Responses

- A. More hands-on training for the new technology in the vehicles

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- B. Enroll in training courses whenever there are technological changes in the vehicles
- C. Elevate their level of computer literacy and become more knowledgeable of measurements that are part of the vehicles' functions and maintenance requirements
- D. Additional training in the rapidly changing areas
- E. Continuing education in the area of computers is very important because we are now able to diagnose and fix a vehicle by reprogramming its onboard computer module instead of raising the hood and using a wrench
- F. Learn the importance of cross-training into being able to perform other repairs that are needed on the vehicle
- G. Have every technician cross-train into other vehicle manufacturer's products
- H. Learn to increase their skill set to a higher level
- I. Learn technology that is related in any aspect to the field of automobile collision repair
- J. Take advantage of the vehicle manufacturer's training opportunities whenever they are offered

Category

- 2. Employees should possess the ability to communicate effectively orally. (4 responses)

Responses

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- A. Improve their communication skills which would lead to improved tone and aptitude that would apply to communicating with customers and fellow employees
- B. Learn the importance of good communication with the office staff regarding the status of the repairs that are being performed on the customer's vehicle
- C. Be able to convey their thoughts in a manner that makes sense and is logical
- D. Learn how to communicate directly with a customer about the vehicle problem

Category

3a. Customer empathy is a necessity. (tie – 3 responses)

Responses

- A. Learn empathy on the part of the customer.
- B. Develop the psychology of understanding the customer
- C. Be as customer-oriented as possible

Category

3b. Keyboarding is a critical skill. (tie – 3 responses)

Responses

- A. Improved keyboarding skills
- B. Learn that the keyboard is a necessary tool that they need to master---just like the screwdriver
- C. Learn how to type better on the computer

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Category

3c. Time management is important. (tie – 3 responses)

Responses

- A. One of the most important things for the technician to learn would be time management because it could result in an increase in productivity
- B. Learn to multitask in order to increase efficiency and ultimately, compensation. This would also result in an increase in the level of customer service
- C. Learn to be efficient as well as effective technicians

Category

3d. The employees need to be proficient in technical writing and reading. (tie – 3 responses)

Responses

- A. Academic courses that would help them follow directions, read schematics, and follow charts
- B. Have the technicians write service orders in order to enable them to understand the functions and importance of the service writers' duties.
- C. Develop managerial skills that are involved in the business---such as writing up the repair orders

Category

3e. Mastering diagnostic skills is essential. (tie – 3 responses)

Responses

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- A. Learn more about the capabilities of the computers and the diagnostic equipment
- B. Increase their knowledge of being able to diagnose vehicles correctly.
- C. Become more familiar with computer programs that are critical to diagnosing problems on vehicles and correcting them

Category

4a. Written communication abilities are vital. (tie – 2 responses)

Responses

- A. Written communications---to include reading, writing, spelling, and proper grammar
- B. Learn how to write in a clear and understandable manner

Category

4b. Understanding production and operations management techniques are fundamental. (tie – 2 responses)

Responses

- A. Learn more about the total operations going on in the shop and be able to communicate that to people involved
- B. Understand the complete mindset that technicians can't work to their own standards. There has to be a system of "checks and balances" that apply to the shop's standards

Category

4c. Achieving automotive service excellence certification requirements can be an important contribution to technicians' effectiveness. (tie – 2 responses)

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Responses

- A. Complete ASE (Automotive Service Excellence) certification requirements.
- B. Take ASE (Automotive Service Excellence) classes, or any other additional training that relates to their field---even if it's something you're not going to use at the present time. It's better to know it and not have to use it than to have to repair something, and not know how to do it.

Category

- 4d. The knowledge of proper handling of power equipment is crucial. (tie – 2 responses)
 - A. Learn how to use the power equipment more (versus hand tools) in order to make the repair job go easier and faster.
 - B. Learn to become more familiar with the equipment in the shop in order to be able to operate it more efficiently and take full advantage of the functions it provides.

Category

- 4e. The technicians should acquire initial computer skills and maintain applicable industry updates. (tie – 1 response)

Response

- A. More computer skills

Category

- 5a. Mathematics is a course area that is used in automotive repair technology.
(tie – 1 response)

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Response

- A. Improved skills in the area of communications and mathematics

Category

5b. The technicians utilize logical and methodical thinking processes. (tie – 1 response)

Response

- A. Think logically and methodically in a timely and accurate fashion.

Category

5c. Principles of business and management apply to the automotive repair technology work environment. (tie – 1 response)

Response

- A. Understand the business model of the service department functions and the importance of efficiency.

Category

5d. Critical and conceptual thinking methods assist the technician in his or her responsibilities. (tie – 1 response)

Response

- A. Get the technicians to think outside of the parameters of their specific jobs in order to have a better understanding of all the facets of the business the the business they are involved with.

Category

5e. The ability to analyze vehicle wiring schematics are key. (tie – 1 response)

Response

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A. Learn as much as possible about the electrical systems of vehicles.

Category

5f. Technicians need interpersonal relations skills. (tie – 1 response)

Response

A. Develop better people skills

Category

5g. In some locations, the possession of a secondary language can be a benefit to the organization. (tie – 1 response)

Response

A. Due to the immigrant customers we have, it would be beneficial if a technician could speak Spanish or Bosnian.

Interview Question Number Five. Interview Question Number Five requested: After reviewing the list of courses from the colleges, what are your thoughts? It sought feedback from the employer representatives after they viewed the list of academic courses comprised from the curricula of the 19 colleges whose associate degree programs in automotive technology were part of the research. I listed the 19 colleges and the academic course categories on the following eight tables.

Table 1. Educational Institutions

Table 2. General Education Courses – Behavioral Science/Social Science/
Humanities/Fine Arts

Table 3. General Education Courses – Business/Human Relations

Table 4. General Education Courses – Communications

Table 5. General Education Courses – Computer-Related

Table 6. General Education Courses – Health/First-Aid)

Table 7. General Education Courses – Mathematics

Table 8. General Education Courses – Physical Science

These tables are list in Appendix D of this dissertation.

After the employer representatives reviewed the lists of courses that were on the tables, I then asked them the question, “After reviewing the list of courses required from the colleges, what are your thoughts?” Their ranked responses from most relevant to least relevant course areas, accompanied by the exact statements from the interviewees, were as follows:

1. Computer Related (Considered to be relevant by 10 interviewees)
 - A. In order to be well-rounded, the technician needs some exposure to social courses, accounting courses, business courses, leadership courses, health and first aid courses, math courses, and there should be a big emphasis on computer courses.
 - B. Almost any type of computer course can help the technician, such as a course that helps them with online learning.
 - C. Computer applications is important for the mega-shops when the technicians are 200 to 300 yards away from the service manager and face-to-face communication is not feasible.
 - D. Combining proficiency in English and computers is important so that someone else doesn't have to fix grammatical issues or spelling issues so that the information can move easily to the next party.

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- E. All industries are moving to being computer-based. In the diagnostics on the automobiles, you are using laptop computers. Knowing how to always hook up a computer is an important thing.
 - F. It is important to take computer classes now to be in the auto collision industry. Many areas are computerized. Estimating the job, repairing the job, and mixing the paint all are computerized.
 - G. Computer courses should be required in the auto body profession. A lot of times, you have to go online to obtain specifications or certain repair procedures.
 - H. I would strongly recommend a course like "Introduction to Computers." In general, I would suggest more computer classes than any other area. Computers are a critical area in estimating.
 - I. It is important to know how to use the computer to perform diagnostics.
 - J. They should be computer literate in order to be able to access the Internet to be able to get information that can help them diagnose and understand the repair that is needed.
2. English Composition (Considered to be relevant by 9 interviewees)
- A. In order to be well-rounded, the technician needs some exposure to social courses, accounting courses, business courses, leadership courses, health and first aid courses, math courses, and there should be a big emphasis on computer courses.
 - B. I can see where English courses are a good idea because they help the technician communicate with the customer.

- C. The composition and communication areas are good ones because the technicians have to explain the repairs they made to the warranty companies. They have to be able to talk to them in a fashion that makes them appear to be credible so the claims will be accepted and paid like they should be. They also have to talk to customers when they go with them on road tests. They may also have to talk to the inspectors who come in and look at the vehicles when we have them torn down.
- D. English skills are very important.
- E. Combining proficiency in English and computers is important so that someone else doesn't have to fix grammatical issues or spelling issues so that the information can move easily to the next party.
- F. You need communication skills, writing skills, English skills, and interpersonal communication.
- G. English is good to have. It helps them communicate.
- H. I think that an English course is a good thing for some of these people because the technicians write the story on the computer. It's sort of a legal document. It really helps to be able to punctuate and spell. You do a lot more reading now than you used to, so you have to make sure that you're understanding everything.
- I. In regards to the English and communications area; reading, writing, speaking---those are all very important because the technician's job involves all of those things. It involves being able to fill out a ticket properly, legibly, and correctly and be able to spell the words of the parts

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and labor that the job requires---and being able to elaborate on those issues when they come up.

3. Introduction to Business (Considered to be relevant by 7 interviewees)

- A. In order to be well-rounded, the technician needs some exposure to social courses, accounting courses, business courses, leadership courses, health and first aid courses, math courses, and there should be a big emphasis on computer courses.
- B. I think that Introduction to Business is a good idea because the technician needs to understand what is expected of them, and how and why that relates to the real world.
- C. When I look at courses like Introduction to Accounting and Introduction to Business, I think that it helps round out their understanding of business.
- D. Business and management is a good course area to know in the auto body business, because to an extent, you should know what goes on in the office, as well as what goes on in the shop.
- E. They need to learn business principles to better understand what I have to go through as the owner of this place. It costs me \$800 every day I'm in business. If I only take in \$750, I lost \$50 that day.
- F. Business, bookkeeping, and leadership is all good to know.
- G. "Introduction to Business" would give them a little bit of a foundation of what goes on in a dealership.

4a. Industrial Mathematics (Considered to be relevant by 6 interviewees- tie)

- A. I think that math needs to be addressed.

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B. I think that a few math classes could help. An algebra course can help the technician think in a pattern where they're able to work a path to get to the answer. That might help them with diagnostics.

C. In our line of work, mathematics is very important.

D. The area of math is important, and there is a need for computer courses.

E. In math, we use the metric system for automobile collision repair.

F. There's a lot of math-related electrical issues in the auto body business.

For example, if you're dealing with ohms, you have to know how far you can push one.

4b. Oral and Interpersonal Communications (Considered to be relevant by 6 interviewees-tie)

A. Anything that related to communication is important.

B. The composition and communication areas are good ones because the technicians have to explain the repairs they made to the warranty companies. They have to be able to talk to them in a fashion that makes them appear to be credible so the claims will be accepted and paid like they should be. They also have to talk to customers when they go with them on road tests. They may also have to talk to the inspectors who come in and look at the vehicles when we have them torn down.

C. You need a good base of communication in the auto body business.

D. You need communications skills, writing skills, English skills, and interpersonal communication.

E. We need good communication skills.

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- F. Communication classes would be good.
5. Accounting (Considered to be relevant by 5 interviewees)
- A. In order to be well-rounded, the technician needs some exposure to social courses, accounting courses, business courses, leadership courses, health and first aid courses, math courses, and there should be a big emphasis on computer courses.
 - B. The technicians do some work in the area of accounting. It applies to keeping track of the time they spend working on the cars.
 - C. When I look at courses like Introduction to Accounting and Introduction to Business, I think that it helps round out their understanding of business.
 - D. I think that it would be a good thing to learn at least a little about salesmanship, accounting, and bookkeeping. Those courses verify the business concept that “it takes money to make money.”
 - E. These courses are all important for becoming a service manager. Accounting and bookkeeping would be necessary to help analyze the profit margins.
- 6a. Safety and First Aid (Considered to be relevant by 3 interviewees- tie)
- A. If your workforce is a little older, like ours is, courses that relate to health, like the Wellness Course, and Introduction to Health and Safety can be beneficial. The course called “Responding to Emergencies” could be very helpful because anything can happen in an instant in this work environment.

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- B. I noticed the first-aid classes. We need to always have someone here who has an understanding of first-aid.
 - C. In reference to the area of health and wellness, you need to be in shape because we do a lot of manual labor. I've seen technicians end up with bad backs or on the job injuries because they were overweight or out of shape. It would definitely help every worker to be in better shape. It would also help the company by keeping their health insurance costs down.
- 6b. Psychology (Considered to be relevant by 3 interviewees- tie)
- A. Psychology and sociology are very good courses for the auto body industry because you have to be able to relate to a customer or an insurance adjuster. Those courses would also be important for mechanics because they have to relate to the service writer who has to relate to the customer.
 - B. A psychology course might be helpful when it comes to dealing with the customer and trying to figure out how to correct a problem.
 - C. Some courses in the social/behavior science area would help them be able to communicate with the customer better and understand the repair order and know what they need to accomplish.
- 6c. Bookkeeping (Considered to be relevant by 3 interviewees- tie)
- A. Business, bookkeeping, and leadership is all good to know.

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B. I think that it would be a good thing to learn at least a little about salesmanship, accounting, and bookkeeping. Those courses verify the business concept that “it takes money to make money.”

C. These courses are all important for becoming a service manager. Accounting and bookkeeping would be necessary to help analyze the profit margins.

6d. Health and Wellness (Considered to be relevant by 2 interviewees- tie)

A. The health course is important. Technicians work around a lot of chemicals and there are hazards in the operation of automotive engines---emissions and so forth.

B. If your workforce is a little older, like ours is, courses that relate to health like the Wellness Course, and Introduction to Health and Safety can be beneficial. The course called “Responding to Emergencies” could be very helpful because anything can happen in an instant in this work environment.

7a. Physics (Considered to be relevant by 2 interviewees- tie)

A. I can see where a physics course can be beneficial because hybrid and electric cars will require an understanding of the proper handling of them or else they can encounter some serious problems. It will benefit the technician in being able to communicate these areas to service advisors and customers.

B. Physics is a fantastic idea. It gets your brain working and gets you thinking about how doing one thing affects another.

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7b. Sociology (Considered to be relevant by 2 interviewees- tie)

- A. Psychology and sociology are very good courses for the auto body industry because you have to be able to relate to a customer or an insurance adjuster. Those courses would also be important for mechanics because they have to relate to the service writer who has to relate to the customer.
- B. Some courses in the social/behavior science area would help them be able to communicate with the customer better and understand the repair order and know what they need to accomplish.

7c. Keyboarding (Considered to be relevant by 2 interviewees- tie)

- A. A typing class would be helpful
- B. They should be computer literate in order to be able to access the Internet to be able to get information that can help them diagnose and understand the repair that is needed.

7d. Leadership (Considered to be relevant by 2 interviewees- tie)

- A. In order to be well-rounded, the technician needs some exposure to social courses, accounting courses, business courses, leadership courses, composition courses, health and first aid courses, math courses, and there should be a big emphasis on computer courses.
- B. Business, bookkeeping, and leadership is all good to know.

7e. Social Science (Considered to be relevant by 1 interviewee- tie)

- A. In order to be well-rounded, the technician needs some exposure to social courses, accounting courses, business courses, leadership courses,

composition courses, health and first aid courses, math courses, and there should be a big emphasis on computer courses.

8a. Geometry (Considered to be relevant by 1 interviewee- tie)

- A. The area of physics and science leads into being able to do things on alignments. They have to make sure that the angles are correct. The suspension is all about the geometry of the vehicle, so that course could help. The newer alignment machines basically tell you everything to do, but they still need to know in their head that if they were given a piece of paper with alignment information on it, they should know what to do.

8b. Accelerated Simulation Mode Training Courses (Considered to be relevant by 1 interviewee- tie)

- A. Training courses that incorporate the ASM concept (Acceleration Simulation Mode) are very helpful. It helps the technician understand what I am talking about, and helps the technician communicate their thoughts to the customer.

8c. Test-Taking Strategies (Considered to be relevant by 1 interviewee- tie)

- A. Any course that can help the technician with test-taking is important because I see some of them being intimidated in that area. Some of them know the information, but they can't seem to recall it when they have to take some of the tests.

8d. Responding to Emergencies (Considered to be relevant by 1 interviewee- tie)

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A. If your workforce is a little older, like ours is, courses that relate to health like the Wellness Course, and Introduction to Health and Safety can be beneficial. The course called “Responding to Emergencies” could be very helpful because anything can happen in an instant in this work environment.

8e. Algebra (Considered to be relevant by 1 interviewee- tie)

A. I think that a few math classes could help. An algebra course can help the technician think in a pattern where they’re able to work a path to get to the answer. That might help them with diagnostics.

8f. Measurements (Considered to be relevant by 1 interviewee- tie)

A. They’ve got to know measurements.

8g. Core Values and Ethical Decision-Making (Considered to be relevant by 1 interviewee- tie)

A. I really feel the need for the class “Core Values and Ethical Decision-Making.” I think that is absolutely number one because this can be a phenomenal business, but it can be a seedy business if you let it become that.

8h. Human Relations (Considered to be relevant by 1 interviewee- tie)

A. The Human Relations course “jumped out” at me when I think about the dynamics of working with service writers, and servicing customers.

8i. Management (Considered to be relevant by 1 interviewee- tie)

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- A. Business and management is a good course area to know in the auto body business, because to an extent, you should know what goes on in the office, as well as what goes on in the shop.
- 8j. Work Ethic and Self-Discipline (Considered to be relevant by 1 interviewee- tie)
- A. They need to learn what a proper work ethic is.
- 8k. Sciences (Considered to be relevant by 1 interviewee- tie)
- A. I'd say that any of the sciences would be helpful
- 8l. Salesmanship (Considered to be relevant by 1 interviewee- tie)
- A. I think that it would be a good thing to learn at least a little about salesmanship, accounting, and bookkeeping. Those courses verify the business concept that "it takes money to make money."
- 8m. Teamwork Building (Considered to be relevant by 1 interviewee- tie)
- A. "Teamwork" is something that needs to be taught in a course.
- 8n. Preparation For Employment (Considered to be relevant by 1 interviewee- tie)
- A. "Preparation for Employment" and "Occupational Leadership" can help them as individuals and improve their work ethic.
- 8o. Career Management (Considered to be relevant by 1 interviewee- tie)
- A. A career management course might not be important for someone who just wants to be a technician, but for someone who wants to be a leader in the business, it would be.

Research Question Number Two. Research Question Number Two was, “How important is it for the employee in the automotive repair (physical and mechanical repair to cars and light trucks) profession to have more than a technically-specific education in order to be thoroughly effective for his or her employers? Interview Question Number One and Interview Question Number Five represent Research Question Number Two. Interview Question Number One initiated the inquiry by asking the employer representative, “What presently does your workforce do well---as far as their work is concerned?” Interview Question Number Five asked, “After reviewing the list of courses required from the colleges, what are your thoughts?” It followed up by presenting the employer representatives with a composite list of the academic courses contained in the curricula of the Associate of Applied Science degree programs in automobile repair technology at the 19 colleges. Interview Question Number One directed attention to the current level of employee performance at the automobile repair establishments. The focus was on the positive attributes the technicians possess to execute effective and efficient repair procedures. Interview Question Number One generated a total of 110 different responses from the employer representatives with whom I spoke. I was able to condense and group these responses into 11 categories. I listed these categories in numerical order in accordance to the number of responses that each received. I also listed the responses from the interviewees under each category title in their exact words and statements.

Interview Question Number One. Interview Question Number One was, “What presently does your workforce do well---as far as their work is concerned?”

Category

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1. They communicate with supervisors and co-workers to support and strengthen the organization. (19 responses)

Responses

- A. We brainstorm together to help improve processes on ways to strengthen customer satisfaction and loyalty.
- B. They effectively work together as a team. What I mean by that is that two or more technicians “put their heads together” for a diagnosis to talk about unusual concerns that we run into.
- C. They feel comfortable bouncing ideas off of each other.
- D. We work well together. If someone gets stuck on something, they can turn to some other technician and get some advice or assistance.
- E. They’re good at teamwork.
- F. They definitely help each other out in a hard diagnosis that has complicated problems.
- G. The technicians work well with the advisors in the area of communications in every aspect.
- H. What I really think that they do well is to work together as a team.
- I. I think that they communicate well as a team, and I think that they have good energy.
- J. They are always able to get along real well, and help each other out.
- K. They follow the information that I put on the repair orders.
- L. They are very good listeners.

- M. They're all committed to accepting the fact that they don't have all of the answers. If they don't know the answers, they ask for help. They are not so arrogant that they think that they know the answer to every repair question.
- N. They know each other well, so they support each other in terms of their strengths and weaknesses.
- O. The workforce complements each other's skills.
- P. They usually work well together---as far as helping each other out who have different skill levels.
- Q. They work well together as a team.
- R. They work good together as a team.

Category

- 2. They are on time, do what is expected of them, and provide additional effort. (18 responses)

Responses

- A. My guys are on time, and they put in a good day's work.
- B. If I need extra time out of them, a lot of guys volunteer to stay late and do other stuff that I need them to do.
- C. I have a very good core of guys out there that respond well and I don't get any guff out of them.
- D. Most of them work exceedingly hard. That means that some of them are willing to work 14-hour days.
- E. They are dedicated and devoted to the job they do.

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- F. My employees go above and beyond the normal job responsibilities of an auto collision repair shop. We strive to achieve the “wow factor” when a customer gets their vehicle back.
- G. They do their utmost to do their job perfectly.
- H. In general, the amount of work that they are required to do on any given day, and the quality of it, and the low number of comebacks is a pretty good indication that they perform their jobs well.
- I. They are good at following the procedures required by the company. There is a certain specified work flow that they have to comply with.
- J. The paintwork technicians do their job very well.
- K. The group of guys I have out there will do whatever it takes to get the job done.
- L. They have a strong belief in taking care of the customer, and will go above and beyond their duties.
- M. They all cooperate at learning all the skills needed in the shop.
- N. They have a good attitude and are willing to learn.
- O. They work efficiently by themselves and have a great work ethic.
- P. They try to work efficiently which in turn saves the customer money.
- Q. They look over cars very carefully---keeping our customers’ safety in mind.
- R. They are loyal and faithful employees.

Category

- 3. They understand and perform the repair required. (15 responses)

Responses

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- A. They know what to look for as far as maintenance needs, and what kind of problems the vehicles is coming in for.
- B. They have a good idea of what repairs are needed to get the car back out on the road again.
- C. “Hands-on stuff”---as far as actually repairing the car, scheduling their time, and getting things done.
- D. They are thorough in their evaluations of the repair needed for the vehicles.
- E. Overall, the trait that applies to them is that they try to be thorough by trying to get to the root of the problem rather than just analyzing the surface of the problem.
- F. We can handle engines and transmissions that require major and minor repair work.
- G. We break the repair jobs down into three groups: heavy engine work, intermediate work (such as brake jobs, tune-ups, water pump replacements), and lighter work (such as oil changes). This enables us to schedule the jobs that come in more efficiently.
- H. We have people who have different strengths and skill levels in the auto body repair business. They are good at what they specialize in (suspension repair work, straightening body panels, frame straightening).
- I. They are very concerned about the end result.
- J. We have different individuals, and each has their personal strength at what they are best suited for.
- K. They are very good at working on both manual and automatic transmissions.

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- L. I have a specialist who is good at removing and replacing the transmissions.
- M. Their particular strengths would be in the area of working on the front-end suspension and steering components of the vehicles that come in.
- N. They fix cars very well.
- O. I have an older technician who has been in the business for a long time. He's an extremely efficient worker, and is very knowledgeable of the older vehicles that come in here to be serviced.

Category

- 4. They understand and use technology and diagnostics. (14 responses)

Responses

- A. They use online methods to do more than get computer-based information.
We use a computer-based multi-point inspection form. I think that they do a good job of completing that. This is used to communicate specific information to the customer.
- B. They are willing to go to the computer to resolve problems that come up on cars.
- C. Any kind of mechanical work---from computer diagnostics to rebuilding engines and rebuilding transmissions---you name it, we do it.
- D. They stay up on the current technology.
- E. They use diagnostic data to their advantage.
- F. I have a diagnostic guy who knows a lot about computers.
- G. We are leaders in the area of diagnostics.

AUTOMOBILE SKILLS REQUIRED AND ACADEMIC COURSEWORK 93

- H. Our employees are well-trained in the technology that is required in the automobile collision repair industry. They know the qualities of high-strength steel and also of alloys---which enables them to be proficient at repairing damaged vehicles.
- I. They are good at performing diagnostics on mechanical or electrical problems.
- J. They are usually pretty good at the diagnosis and repair of the vehicles that come in here.
- K. They are good at critical thinking because they have to come to conclusions on the diagnosis of a vehicle.
- L. They have good electronic and computer skills.
- M. They are good at diagnosing the problem by test-driving the vehicle or by diagnosing the problem with a scan tool.
- N. I have two really strong diagnosticians.

Category

- 5. They are versatile and flexible. (13 responses)

Responses

- A. Most of them are master technicians. That mean they are trained all the way across the board in everything. This allows me to give them any repair job that comes in.
- B. My particular group has been trained on everything. There's no specialization---other than by the manufacturer's vehicles.

AUTOMOBILE SKILLS REQUIRED AND ACADEMIC COURSEWORK 94

- C. Each technician is trained “all around” to be able to work on an engine, a transmission, the interior, air-conditioning---and so on. They’re not just specialized.
- D. All areas---everybody in the workforce does their job well. They are all competent and experienced.
- E. The majority of the workforce is experienced enough to handle any of the work that comes into the shop. They can handle jobs that range from tune-ups to engine rebuilding.
- F. They are able to work on various makes and models of cars because that is the type of business we attract since we are not a dealership that specializes in vehicles from one particular manufacturer.
- G. They are versatile because they can do a variety of automotive repairs.
- H. They do a broad range of auto repairs such as brakes, exhaust, tires, alignment, tune-ups, fuel system work, steering, suspension---practically every type of maintenance that a vehicle needs.
- I. We can cover everything from routine services to major mechanical repair.
- J. They are able to work on all kinds of vehicles.
- K. They can perform duties that range from general maintenance to certified warranty repairs.
- L. They have a high level of ability to adapt because of the constant change in the industry.
- M. They are able to work on all makes and models of vehicles.

Category

AUTOMOBILE SKILLS REQUIRED AND ACADEMIC COURSEWORK 95

6. They perform their job responsibilities in a quality manner. (8 responses)

Responses

- A. The actual repair of the vehicle---they do very well.
- B. They do a quality job.
- C. The group I have here really cares if the car is fixed right, or not.
- D. They do a good job repairing vehicles---fixing cars, and most of that is attributable to their training and skill set.
- E. They do their job to the utmost of what they can do---as far as skill and ability.
- F. Our shop is definitely known for the quality and satisfaction we put into our repair jobs. Our goal is to have zero “comebacks” or customer returns---and we’re very close to achieving that.
- G. They all have a particular strength in repairing the body of a car. This includes replacing and refinishing body parts, and disassembling and assembling cars. It takes an art to repair things to the point where they were before they were in the accident.
- H. Their quality of workmanship is very good.

Category

7. They have a high level of experience and training. (7 responses)

Responses

- A. I think that they do an overall good job of keeping consistent on their training, and the quality of workmanship they provide.
- B. They are experienced with all aspects of mechanical work.

AUTOMOBILE SKILLS REQUIRED AND ACADEMIC COURSEWORK 96

- C. They do almost everything well, but some have specialties. For example, I have one technician who takes care of differential work.
- D. They are brilliant with the actual work they do on cars.
- E. They're very knowledgeable about what they're working on. All of our guys have a lot of experience, so as far as that area goes, we're good.
- F. I have technicians who are very good at working on electrical systems and I have other technicians who are good at the mechanical jobs.
- G. They are highly-trained. If there is any training course that they need to take, or even want to take, I'm willing to provide for it.

Category

- 8. They are detail-oriented. (6 responses)

Responses

- A. They don't try to take shortcuts or simply "rig" something together to fix the problem.
- B. They are pretty good about staying on task, and doing what they need to do.
- C. They are very detail-oriented---and that's because the tasks require it.
- D. Some of them are very detail-oriented. Most of them are very good in that area because in this business, you have to be very thorough.
- E. The main thing we do well is to be attentive to detail.
- F. They're very task-oriented.

Category

- 9. They communicate well with customers and with the public. (5 responses)

Responses

AUTOMOBILE SKILLS REQUIRED AND ACADEMIC COURSEWORK 97

- A. They understand their job completely, and they communicate well with customers.
- B. They interact well with other people.
- C. They have common sense which enables them to listen to what a customer is trying to tell them, and “roll” it into what the problem is with the vehicle.
- D. They are good at listening to the customers, diagnosing the problem, and performing the needed repair on the vehicle.
- E. They understand that the work they do is important. So, when the customer brings their car in, they realize that this business would not be in operation if we didn’t have customers.

Category

10. They fix it right the first time. (3 responses)

Responses

- A. Everyone in the shop knows when there is a troubled problem in the shop. Our “Fix It Right” (program) is continuously at or near 100%---and I believe that is why---because everybody does care about getting the car fixed, and they put aside whatever they’ve got going on to help each other.
- B. Fix it right the first time---85% of the time.
- C. They repair the vehicle right the first time.

Category

11. They are ethical and thorough with documentation that is required. (2 responses)

Responses

- A. Some of them are very thorough with their paperwork.

- B. They are very knowledgeable about their ethical practices. They don't stoop to the level of doing work that is not necessary.

Transitioning to the concern of Research Question Number Two, which regarded the level of importance for automobile repair technicians to possess more than a technically-specific education to be effective in his or her job, Interview Question Number Five delves into the feedback from the respondents.

Interview Question Number Five. Interview Question Number Five requested, "After reviewing the list of courses required from the colleges, what are your thoughts?" I presented a compilation of the academic courses that were part of the requirements of the automotive technology programs at 19 different postsecondary institutions in the Missouri and Illinois areas to the employer representatives and solicited their feedback. The institutions selected and the academic courses obtained from their programs are depicted on the tables in Appendix D.

I previously listed the responses to Interview Question Number Five under Research Question Number One because these replies initially addressed that inquiry. The 35 interviews I conducted provided data that have the potential to make contributions toward improved programs and a positive impact on the proficiency of the automobile repair technicians. A full text of their responses to Interview Question Number Five is found on pages 76 through 87 of this research.

Research Question Number Three. Research Question Number Three was, "What, if any, academic skills are lacking?" Interview Question Number Two and Interview Question Number Three characterize Research Question Number Three. This research question sought to determine what, if any, academic skills were lacking in the

background of automobile repair technicians in the workforce. It began the analysis with a basic probe for data relating directly to the technicians' skill level. I undertook this probe with Interview Question Number Two that addressed the basic issue of their performance deficiencies by asking the employer representatives, "What do they not do well?" Interview Question Number Two generated a total of 62 responses from the employer representatives with whom I spoke. I was able to condense these responses down to fifteen categories. I listed these categories in numerical order in accordance to the number of responses that each received. I have also listed the responses from the interviewees under each category title in their exact words and statements.

Interview Question Number Two. Interview Question Number Two asked the employer representatives to comment on the automobile repair technicians they employed with the inquiry, "What do they not do well?"

Category

1. They are not sufficiently detail-oriented or thorough. (10 responses)

Responses

- A. Some don't do a complete job when doing transmission work on the cars.
They don't perform the additional flush of the system.
- B. They don't follow all of the steps in a repair process.
- C. Confirming---such as in making sure that the correct part was ordered for the repair that was required.
- D. They don't always stop to re-evaluate their diagnosis of a vehicle when they should.

AUTOMOBILE SKILLS REQUIRED AND ACADEMIC COURSEWORK 100

- E. They don't keep an eye open for extra services or parts that a customer's vehicle might need.
- F. They don't provide complete information about what they did on the vehicle. And what the vehicle might need now or in the future. This hinders the possibility of more repair business.
- G. Some of the guys need to be more thorough.
- H. They don't check the car thoroughly enough (as in test-driving) to make sure that the car is fixed properly.
- I. I have to stay on the technicians to make sure they follow the proper procedures---such as in applying the proper amount of torque when they are tightening something.
- J. In some situations they lack detail.

Category

- 2. They do not communicate well in written or in verbal form. (9 responses)

Responses

- A. Communication---they lack in this skill in the area of spelling and English.
- B. Report writing and documenting skills are lacking.
- C. Some of the technicians aren't very good in the areas of reading, writing, and spelling---literacy skills---which has become very important.
- D. They don't communicate well with the service writer. This can be important because the service writer is responsible for communicating with the customer.

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- E. The technicians don't communicate well with the office personnel about what stage of the repair the vehicle is in.
- F. Written communication---areas such as English, punctuation, and spelling would be an area that needs a lot of improvement in.
- G. There are often communication gaps.
- H. They don't follow instructions and communicate properly.
- I. Attention to detail is lacking. That would be in regard to their write-ups on the automobile repair orders.

Category

- 3a. They may have a poor work ethic, a poor personal appearance, or level of self-discipline. (8 responses- tie)

Responses

- A. They lack a decent work ethic.
- B. I can't always get them to work---to be here every day, show up on time, and to concentrate on their job.
- C. The younger guys don't have an adequate sense of personal discipline and self-worth.
- D. They don't always present a professional appearance---whether it's themselves, their work area, or their tools.
- E. There's too much gathering in the morning and after lunch when they should be getting back into the work mode.
- F. Sometimes there's a militant attitude among some of the technicians.

AUTOMOBILE SKILLS REQUIRED AND ACADEMIC COURSEWORK 102

- G. They are not the cleanest guys. I try to impress upon them that the appearance of the building and their personal appearance makes a difference in how the customer perceives the business. The customer may get the impression that unprofessional work is being done by a technician who is unprofessional looking.
- H. They don't keep the shop area clean.

Category

3b. They do not plan or organize themselves as necessary. (8 responses - tie)

Responses

- A. As a team, they need to be better organized---knowing where every tool is. I'd like them to buy into the concept of "continuous improvement."
- B. Every aspect of the business could be improved if we strengthen our shop organization principles. Our paperwork processing could also benefit.
- C. The technicians are not using the machinery that is in the shop to their full advantage.
- D. They don't read the repair estimates thoroughly. They don't spend enough time reviewing the repair order to note the parts that are required for the repair job.
- E. They don't plan.
- F. Organization is the key to efficiency in the shop---and most of the guys aren't organized.
- G. Some of the technicians either don't allocate the money to invest in tools, or they don't have the desire to invest in tools.

AUTOMOBILE SKILLS REQUIRED AND ACADEMIC COURSEWORK 103

- H. We don't do general repair work to vehicles (such as air-conditioning and alignment) because we don't have the proper equipment to be good at those areas.

Category

4. They have poor time management skills or a low level of productivity. (6 responses)

Responses

- A. They don't always manage their time properly.
- B. They don't keep busy enough to get enough vehicles finished throughout the working day.
- C. Speed of service---most of them don't work with enough intensity.
- D. One of my guys is overly thorough.
- E. Prioritizing is a problem---knowing which vehicle needs to be worked on when and where and how; and for what reason one needs to be done first, second or third.
- F. The technicians are not working at the time standards where they should be.

Category

4. They are inexperienced or possess a lack of desire to learn new required skills or information through additional training. (5 responses)

Responses

- A. Some of the guys who have been here the longest aren't as interested in going to training classes as much as they need to.
- B. I have inexperienced younger technicians.

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- C. I have a technician that I have to push to attend continuing education classes.
- D. They don't work as well on vehicles that aren't part of the dealership's product line. This could be due to them not having access to the other manufacturer's software.
- E. A lot of the technicians don't want to get involved enough with after-working hours classes.

Category

- 5. They have poor scholastic or technological skills. (4 responses)

Responses

- A. Some of them don't test well---which is probably due to not picking good study habits when they were in school.
- B. Not all of them have basic computer skills or keyboard ability.
- C. The older techs don't all have computer skills that include knowledge of Microsoft and windows.
- D. They don't use the industry-specific software in the computers to their advantage.

Category

- 6. They do not or cannot communicate well with customers. (3 responses – tie)

Responses

- A. Sometimes the technicians talk in language that the customers don't understand (technical terms or acronyms).
- B. One of my guys could have a more developed personality toward communicating with the customers.

AUTOMOBILE SKILLS REQUIRED AND ACADEMIC COURSEWORK 105

C. They all need to be more customer-oriented.

Category

7a. They do not divulge damaging a customer's car or making it dirty, or they are not customer-conscious. (3 responses – tie)

Responses

A. They don't always tell us if they get a customer's car dirty.

B. The technicians don't empathize in their jobs enough. They don't meet the customer, so there's a disconnect.

C. It needs to be more important for the technicians to keep the customer in mind.

Category

7b. They attempt to avoid duties or responsibilities. (1 response – tie)

Response

A. They "cherry-pick" the jobs---which means to try to avoid a particular job so some other technician will get it.

Category

8a. They lack a skill or have an insufficient level of it. (1 response – tie)

Response

A. Some of them could be better at wiring on the vehicles.

Category

8b. They do not keep themselves in good physical condition. (1 response - tie)

Response

AUTOMOBILE SKILLS REQUIRED AND ACADEMIC COURSEWORK 106

- A. They don't keep themselves in shape---which results in more physical fatigue, strains, and doctor's appointments.

Category

- 8c. They have an insufficient level of multitasking ability. (1 response – tie)

Response

- A. Multitasking is something they don't do well---working on more than one car at a time efficiently.

Category

- 8d. They do not fully grasp the teamwork concept. (1 response – tie)

Response

- A. They don't work together well as a team.

Category

- 8e. They are deficient in critical thinking skills. (1 response – tie)

Response

- A. They don't always possess critical thinking skills that will help them get to the right conclusion about the necessary repairs for the vehicles.

The data gleaned from these responses required further clarification with an additional interview question.

Interview Question Number Three. Interview Question Number Three requested, "What do you wish your employees could do or know---that they presently cannot do or do not know?" This interview question continued the more extensive research process of the project by addressing Research Question Number One which made the inquiry, "What educational needs, if any, do employers perceive their

automobile repair technicians require for an improved training program?” Interview Question Number Three generated a total of 56 responses from the employer representatives with whom I spoke. I was able to condense and group these responses into fifteen categories. I listed these categories in numerical order in accordance to the number of responses that each received. I also listed the responses from the interviewees under each category title in their exact words and statements.

Interview Question Number Three: What do you wish your employees could do or know--that they presently cannot do or do not know?

Category

1. They need education that will enable them to acquire new skills and will help the organization progress. (9 responses)

Responses

- A. Some of my mechanics need to be able to work at a higher skill level.
- B. I would like them to have more extensive knowledge of the mechanicals of the vehicles that come into the shop. Since they are certified for auto-collision repair, they obviously concentrate on that since our business specializes in that field. They aren't able to do much of the mechanical work that comes in. I'd like for them to have education in that area too.
- C. It would be helpful for my technicians to be able to diagnose problems in other manufacturers' vehicles in regard to software training. If we were able to do that, we could do more with other vehicles, and have more business. Currently, when those other vehicles come in for in-depth repairs, we aren't able to service them.

AUTOMOBILE SKILLS REQUIRED AND ACADEMIC COURSEWORK 108

- D. I'd like to get rid of the intermediate category of technicians by having them work themselves up to the point of being in the top-level category. I'd like for them to be able to do whatever needs to be done---instead of limiting them to brake work, tune-ups, and water pump replacements. If this were to happen, the work could flow a lot smoother.
- E. Some additional hands-on training of equipment usage (from a knowledgeable source) would help them know what they need to know to help them perform their job better.
- F. I would like to have one of the technicians in our shop to be able to perform "paintless dent repair." We currently have an outside vendor who comes in and does that.
- G. I'd like for the technicians to be able to do air-conditioning work, alignment work, and tire work---even though our shop specializes in repairing transmissions.
- H. One of my technicians needs to be more experienced at rebuilding import vehicle transmissions.
- I. They could be better at the advanced diagnosis that is required on later model European cars. The European cars are more difficult to diagnose, and in some aspects, they are very unique. We are willing to pay for any training that they want to go to.

Category

AUTOMOBILE SKILLS REQUIRED AND ACADEMIC COURSEWORK 109

2. They need to comply with ongoing education and training requirements. Also they need to have the desire to advance in their field of automotive repair. (7 responses)

Responses

- A. I would like for all of the technicians to keep up with their routine training from the automobile manufacturer.
- B. I'd like for my technicians to take more classes that are offered by the vehicle manufacturer so they can learn as much as they can. In this industry, you can never know too much.
- C. In general, I want my technicians to pursue the areas of continuing education coursework out of their own desire instead of my mandate.
- D. I would like for my technicians to keep up with the changing technology of the vehicles because there are changes to the vehicles every year.
- E. I wish that they could go to the manufacturer of some of these machines so they could get better trained on them and be able to use them at a faster pace.
- F. They should take additional schooling that covers new things happening on vehicles.
- G. They could take more continuing education classes in order to keep current with vehicle specifications and repairs that the industry demands.

Category

- 3a. They should be able to communicate diagnostic and repair procedures well both verbally in writing. (6 responses – tie)

Responses

AUTOMOBILE SKILLS REQUIRED AND ACADEMIC COURSEWORK 110

- A. The technicians don't communicate sufficiently enough about what they actually did to perform the repairs.
- B. They need to communicate better about what they did to get to the core problem.
- C. There are some of my technicians who could contribute more to the business if they had better English, spelling, and typing skills. They should be able to tell the story about the repair, so creative writing knowledge would be helpful.
- D. They need to have better typing skills and a higher level of knowledge in the area of grammar and spelling. There are documents that we type up to give to a client, so we definitely should not misspell the work "alignment" or "diagnosis" because that would not present a professional image of our business.
- E. Write legibly.
- F. I wish that they could compose and write better. If they would envision themselves in my position where I have to communicate with the customer, they might better understand the importance of being more thorough and complete with what they write on the repair orders.

Category

3b. They should possess a sufficient level of computer and technology knowledge.

(6 responses – tie)

Responses

- A. Not all of them are sure how to set up the computer connections of download the software they need, or set up a parameter when something goes wrong.

AUTOMOBILE SKILLS REQUIRED AND ACADEMIC COURSEWORK 111

- B. They don't all know how to get around the firewall stuff, set up the commands that are needed, and go back in and change it for the next type of vehicle--- since they don't all work the same way.
- C. They need to know how to use the diagnostic equipment and computer software to their advantage.
- D. More basic knowledge of computer operations would be a good thing. It would also help to study up on the body-shop oriented software because it would apply to estimating and frame-pulling types of work.
- E. I have a technician who didn't pursue the schooling that he should have which prevented him from having computer skills and knowledge of electronics in automobiles.
- F. It would help if the older employee would be more familiar with Internet tools and repairs.

Category

4a. They should possess basic business and legal knowledge.

(4 responses – tie)

Responses

- A. They don't all have enough basic business skills and knowledge---such as sales minus total expenses equals the bottom line---not sales minus their pay.
- B. The technicians need to have a better picture of the legalities of the business and the costs involved in the business.
- C. I would like for one of my employees to be more involved in the business part of the operation.

AUTOMOBILE SKILLS REQUIRED AND ACADEMIC COURSEWORK 112

- D. The technicians out on the shop floor don't know enough about how the overall business is run---what it takes to make a profit.

Category

- 4b. They should be better at having empathy for and communicating with the customer. (4 responses – tie)

Responses

- A. I wish that the technicians could truly understand how the customer sees the whole process from their point of view. They need to know that the customer is in a “problem” frame of mind.
- B. When they communicate with the customer, they need to be better able to explain what they did to repair the vehicle.
- C. I'd like for the employees to fully understand the business as a whole and what we have to do sometimes to make the customer happy with a repair job.
- D. Most customers don't know exactly what their car needs or when to do a certain thing to it. So, the most important thing I would like for my technicians to do is to educate the customer about those things. I'd like for the technicians to be more concerned about the customer's “vehicle welfare.”

Category

- 4c. They should be sure there is proper documentation of the parts and labor involved in the repair job. (4 responses – tie)

Responses

- A. I would like for the technician to be able to communicate better back to the service writer about what they did to resolve the problem with the vehicle.

- B. I wish that they would always follow the proper procedure of the repair routine which is to list what they did to the vehicle, what the job entailed, and how they came to the conclusion they arrived at---such as the diagnostic codes that were displayed and what they indicated. They are supposed to start there because they have a “diagnosis tree” which they are supposed to follow until they find the problem.
- C. They should know how important it is to include all of the aspects of the repair (parts and labor) that is needed in order to make sure that some of the steps aren’t omitted. This could detract from doing the job correctly and profitably.
- D. They need to know how to document all aspects of the repair better.

Category

- 4d. They should be sure to always perform an accurate diagnosis of the required repair. (4 responses – tie)

Responses

- A. It would be helpful for the technicians to fully understand the importance of “drivability.” This term refers to the ability of a technician to correctly and fully diagnose problems with vehicles, determine exactly what the repair requires, and fix it properly the first time.
- B. They need to use their common sense more to figure to figure problems out when they are working on a vehicle.
- C. I wish I had guys who were a little better at diagnostic work.

AUTOMOBILE SKILLS REQUIRED AND ACADEMIC COURSEWORK 114

- D. I would like for one of my technicians to increase his knowledge of the scanning equipment that we use to diagnose a vehicle. He needs to do this so he knows what to look for on the vehicle that correlates with the problem he is trying to figure out.

Category

5. They should have a high level of productivity. (3 responses)

Responses

- A. In general, the technicians need to know how to work smarter, not harder.
- B. I want my technicians to be able to perform repairs on a more efficient basis.
- C. I would like for my technicians to be able to meet or beat the average amount of time indicated for a job more often.

Category

- 6a. They should be sure to verify the repairs needed and to follow directions closely.
(2 responses – tie)

Responses

- A. The first thing they're supposed to do is to verify the repair concern, and then they are supposed to check and see if there are any known issues. They are definitely supposed to do that step. It is something that doesn't happen enough.
- B. Follow directions.

Category

- 6b. They should be able to multitask. (2 responses – tie)

Responses

AUTOMOBILE SKILLS REQUIRED AND ACADEMIC COURSEWORK 115

- A. It would make my life easier if I could have the guys more involved in looking up parts and running the shop a little bit instead of just the technical responsibilities.
- B. I'd like for them to be more efficient by being able to work on two cars at once---to develop the ability to multitask. The oil changing process could be occurring on one vehicle while the transmission flushing equipment could be getting hooked up to another vehicle.

Category

- 6c. They should possess more organization, thoroughness, accuracy, and detail-oriented skills. (2 responses – tie)

Responses

- A. Be more organized and more thorough. Sometimes a situation (like a fitting that didn't get tightened) gets overlooked---which requires the customer to come back. Probably one of the reasons this occurs in our shop is because the auto body repair technicians work on a "flat rate" basis. They get paid to do a particular repair job on a vehicle---no matter how long it takes them to complete it.
- B. They could be more detail-oriented.

Category

- 7a. They should be able to properly perform the needed repairs. (1 response – tie)

Response

- A. The technician should know all of the parts that are required for the repair job they are getting into, and make sure that they have these parts before they start

on the vehicle.

Category

7b. They should be able to conceptualize. (1 response – tie).

Response

A. My technicians need to be able to conceptualize.

Category

7c. They need to embrace the concept of teamwork. (1 response – tie).

Response

A. I'd like for my technicians, as a group, to be more knowledgeable of the importance of teamwork because that can contribute to the overall operating efficiency of the business. The parts of operating this business can change on a month-to-month basis.

I composed the research questions in order to achieve the primary objective of this project. My objective was to relate the need and the importance of academic skills, obtained through general education coursework, to the effectiveness and efficiency of the automobile repair technician's expertise in his or her employment. To focus on the current issues the employment representatives face, I presented them with five interview questions with the intention of identifying the technicians' strengths, weaknesses, and needs. The interviewees' responses expressed problems in the areas of efficiency, effectiveness, and productivity. My interviews also managed to extract suggestions and potential solutions to fill the gaps. In Chapter Five I assess responses obtained from this compound issue and establish if academic skills are inadequate.

Summary

The primary purpose of Chapter Four was to present the results of my data collection and data organization activities. These efforts reflected on the problem statement and the purpose of the study in Chapter One. They recognized that academic skills acquired through coursework can be a necessary complement to technically-specific courses for the automobile repair technician.

I obtained primary data from employers of the technicians by meeting with them personally and getting their responses to the following five interview questions:

1. What presently does your workforce do well---as far as their work is concerned?
2. What do they not do well?
3. What do you wish your employees could do or know---that they presently can not do or do not know?
4. If you could suggest something the individual employee could learn that would benefit them and your organization, what would it be?
5. After reviewing the list of courses required from the colleges, what are your thoughts?

I related these five interview questions with the following research questions:

RQ1: What educational needs, if any, do employers perceive their automobile repair technicians require for an improved training program?

RQ2: How important is it for the employee in the automotive repair (physical and mechanical repair to cars and light trucks) profession to have more than a technically-specific education in order to be thoroughly

effective for his or her employers?

RQ3: What, if any, academic skills are lacking?

I initiated the collection of my data by addressing the positive attributes of the automobile repair technicians at the organizations where I conducted my interviews. My primary concern was to determine if the employer representatives felt their technicians could profit from an improved training program. All of the 35 interviewees affirmed this point. This feedback enabled me to proceed with the other issues in my research questions that inquired about perceived educational needs. The category that elicited the most responses, which pertained to desired knowledge for the technician and benefitted him or her and the organization, was, “Employees need training to correspond to new technology in vehicles.” The replies in this category emphasized the importance of computer literacy, an understanding of mathematical measurements, and the overall ability to comprehend and to adapt to advanced skill sets. Other categories cited that related to this area included keyboard proficiency, diagnostic skills, and analysis of vehicle wiring schematics.

The respondents also stressed the need for comprehensive communication skills for the technicians in their workforce. Written composition aptitudes are essential for the proper completion of reports that provide necessary documentation for warranty applications and for accurate billing. The rhetoric benefits derived from an English course are important for the technicians when verbal interaction with customers, co-workers, and managers is essential.

Some of the reactions from the employer representatives indicated problem areas and implied that the technicians do not possess a sufficient level of attention to detail.

The category of responses from the interview question, “What do they not do well?” accentuated this deficiency. Many of the responses referred to specific steps omitted in the repair process that could often result in an incomplete servicing of the vehicle. The consequences of this activity could be detrimental to customer satisfaction and the organizations’ productivity.

The employers of automobile repair technicians rely on the career technical educational schools to deliver the level of instruction required in the workplace. Some of the employers expressed concerns about the comprehensiveness of the automotive technology programs currently offered. One specified his preference for technicians who possessed an associate degree versus a certificate. Another employer stated he had a penchant for graduates who earned an Associate of Applied Science in automotive technology from a certain college.

To note the content of their curricula, I compiled secondary data from 19 postsecondary institutions that offer associate degree programs in automotive technology. In Table One I listed the specific 19 institutions whose curricula I examined. Then, I analyzed this data for its differences and similarities among the institutions and, on Tables Two through Table Eight in Appendix D, listed the general education academic courses in the various subject matter categories. Where more than one institution offers a particular course title, the abbreviations for all of those institutions offering that course are included. Where only one institution offers a particular course, only the abbreviation for that institution is specified. Also, I noted potential contributions from both course categories and specific courses.

AUTOMOBILE SKILLS REQUIRED AND ACADEMIC COURSEWORK 120

In Chapter Five I analyzed problems that I indicated in my literature review. I also directed attention to educational needs perceived by employers of automobile repair technicians. An important educational element I analyzed was the learning applications that have the potential to provide benefits to this workforce.

**Chapter Five: Analysis and Discussion, Conclusions, Implications,
Recommendations for Further Research**

In this chapter I have provided an analysis of the data researched combined with a comprehensive discussion of it. Conclusions and implications for practice follow this material. Finally, I have noted my recommendations for further research that may have the potential to contribute to the quality of automobile repair technology education programs.

Overview

The purpose of this research study was to determine the need for and application of skills, obtained through academic coursework, to the effectiveness and efficiency of the automobile repair technician's expertise in his or her employment. Although the incoming student in this area of career technical education may question whether academic coursework is applicable to the skills he or she requires for proficiency in this occupational area, the employers have a more accurate perspective. They can verify that, in the 21st century, automobiles are considerably more complex and sophisticated than they were in the 1900's. They have witnessed situations in the service and repair environment that require the technicians to possess a more comprehensive education than what was necessary in the generation of the automobile "mechanic" and the automobile "body man."

To further address the issue of a potential need for today's automobile repair technician to acquire a more thorough education, it is logical to cite relationships that exist. Academic courses that develop critical thinking skills are an example for non-technical coursework that contributes to the technician's ability to diagnose complex

automotive systems. Those employed in new vehicle dealerships usually are responsible for the completion of reports viewed by supervisors, customers, and often, representatives from the manufacturers' warranty departments. In these situations, an understanding of correct sentence structure, which was gained through the completion of an English Composition course, can contribute to the academic skills necessary to benefit them in this area.

The research questions selected for this study focus on the perceived educational needs employers have for their automobile repair technicians, the level of importance a diversified education has for them, and the possibility of a deficiency in the area of academic skills. These research questions were as follows:

RQ1: What educational needs, if any, do employers perceive their automobile repair technicians require for an improved training program?

RQ2: How important is it for the employee in the automotive repair (physical and mechanical repair to cars and light trucks) profession to have more than a technically-specific education in order to be thoroughly effective for his or her employers?

RQ3: What, if any, academic skills are lacking?

These research questions structured the formation of five interview questions presented to owners or managers of 35 automotive establishments or dealership departments that performed physical or mechanical repair to cars and light trucks. The questions sought to elicit data regarding their current viewpoint of the skill level of their technicians and potential identification of the need for academic coursework in the education and training programs. The interview questions were as follows:

AUTOMOBILE SKILLS REQUIRED AND ACADEMIC COURSEWORK 123

- IQ1. What presently does your workforce do well---as far as their work is concerned?
- IQ2. What do they not do well?
- IQ3. What do you wish your employees could do or know---that they presently cannot do or do not know?
- IQ4. If you could suggest something the individual employee could learn that would benefit them and your organization, what would it be?
- IQ5. After reviewing the list of courses required from the colleges, what are your thoughts?

The interviewees were owners or managers from automotive mechanical and collision repair departments or facilities based in both manufacturer-represented dealerships as well as independently-owned establishments.

I also collected data from the curricula of the automotive repair technology programs at 19 colleges in the bi-state (Illinois and Missouri) area to extract the academic courses required for completion of the Associate of Applied Science degrees offered. From these curricula, I compiled a comprehensive list of these courses and provide them to the interviewees. I accomplished this presentation in conjunction with the Interview Question Number Five inquiry.

The overall objective of my communication with the respondents was to obtain unbiased replies and perceptions as to whether automotive repair technicians can be more effective and efficient in their work environment if they possess a higher level of proficiency in the area of academic coursework. The significance of my study was to determine if there is a corresponding relationship between academic coursework and the

skills required of automobile repair technicians. I tallied the data obtained from the employers' responses and made notations for categorical and individual course preferences.

One of the key points I determined from the literature I reviewed for my research is that a gap exists between “academic” and “vocational” courses. Prentice indicated that programs and experiences are necessary to bridge the gap (2001, p. 80). Although various methods of informal education provided the necessary skills to learn a trade in the 18th century and the progression of industrial arts plus vocational education prepared the semi-skilled or skilled workers for emerging occupations such as the automobile mechanic in the 20th century, the term career technical education more accurately reflects what is necessary for the 21st century automobile repair technician.

Analysis and Discussion of Data

In this chapter, I provided an analysis of the results from the data and presented a structure for potential modifications of curricula at postsecondary educational institutions that offer automobile repair technology programs. The key elements of this analysis were the responses obtained from the employer representatives I interviewed and the academic courses included in the programs of the Associate of Applied Science Degree in Automobile Repair Technology at the 19 postsecondary institutions I surveyed. I related these components to information I obtained from the literature discussed in Chapter Two of this dissertation.

Research Question Number One. Research Question Number One asks,

“What educational needs, if any, do employers perceive their automobile repair technicians require for an improved training program?” As previously stated in Chapter

Four, Interview Question Number Four addressed some of the concerns of this research question by asking the employer representatives, “If you could suggest something the individual employee could learn that would benefit them and your organization, what would it be?”

Analysis of Interview Question Number Four responses. Each of the 35 respondents indicated there is something the individual employee could learn that would benefit him or her and the organization. Some of the employer representatives elaborated more than others and provided detailed examples for improvement. I received 45 responses from the interviewees that I summarized into 19 different categories. I detailed the word-for-word responses from the interviews in Chapter Four. These response categories are as follows:

1. Employees need training to correspond to new technology in vehicles.
2. Employees should possess the ability to communicate effectively orally.
3. Customer empathy is a necessity.
4. Keyboarding is a critical skill.
5. Time management is important.
6. The employees need to be proficient in technical writing and reading.
7. Mastering diagnostic skills is essential.
8. Written communication abilities are vital.
9. Understanding production and operations management techniques are fundamental.
10. Achieving Automotive Service Excellence Certification Requirements can be an important contribution to technicians’ effectiveness.

11. The knowledge of proper handling of power equipment is crucial.
12. The technicians should acquire initial computer skills and maintain applicable industry updates.
13. Mathematics is a course area used in automotive repair technology.
14. The technicians utilize logical and methodical thinking processes.
15. Principles of business and management apply to the automotive repair technology work environment.
16. Critical and conceptual thinking methods assist the technician in his or her responsibilities.
17. The ability to analyze vehicle wiring schematics is key.
18. Technicians need interpersonal relations skills.
19. In some locations, the possession of a secondary language can be a benefit to the organization.

The second person I interviewed responded to this interview question by stating he felt the academics element of the job was actually more important than the technical skill element. This individual emphasized that if his technicians improved in the areas of communication and mathematics, they would be able to arrive at the core issue of the repair requirements more quickly and to report the results to the service managers and service writers more efficiently. An example of this belief applies to electrical diagrams and schematics when an accurate diagnosis is necessary. By following directions on a diagnostic chart, the employee is better able to understand the technology involved in the repair procedure. It is apparent that the respondent not only acknowledges the need for inclusion of academic course skills in the technical work environment, but considers

them to be indispensable. This acceptance supports research that was conducted on the importance of curriculum integration (Zirkle, 2004, p.24).

Another respondent also referred to the importance of communication when he mentioned the role of the technical support team in his organization. He expressed that the technician's communication with the team during complex repair issues would improve the effectiveness of his service department. This is a reflection of an element of Henschke's fourth building block, "Teaching tips and learning techniques" (Henschke, 1987, pp. 415-419). Examples of group discussions, simulations, and case studies challenge learners to analyze a situation or a problem and apply their skills and knowledge toward a resolution.

Analysis of Interview Question Number Five responses. Interview Question Number Five asked, "After reviewing the list of courses from the colleges, what are your thoughts?" This question accompanied the list of academic courses offered in the curricula for associate degrees in automobile repair technology programs at the 19 colleges I researched in the bi-state (Illinois and Missouri) area. It focused on obtaining opinions sought to determine, if, and what academic courses contributed to the effectiveness and efficiency of the automobile repair technician. It addressed the concerns of Research Question Number One, as well. The educational needs dealt with in this research question involve academic coursework as a potential improvement. I accomplished this inquiry by presenting a composite list of academic courses to the employer representatives. The list consisted of 11 course categories that provided 97 different courses. These 11 categories are as follows: Behavioral Sciences, Social Science, Humanities, Fine Arts, Business, Human Relations, Communications, Computer

Related, Health/First Aid, Mathematics, and Physical Science. I extracted this list from the curricula for the programs of Associate of Applied Science Degree in Automobile Repair Technology programs at the 19 postsecondary institutions I surveyed. In order to solicit an unbiased response, this interview question was, “After reviewing the list of courses required from the colleges, what are your thoughts?” Of these specific courses, the interviewees pinpointed 30 that they considered to have a positive impact on knowledge and skills needed by the automobile repair technician. These 30 courses are as follows: Computer-Related, English Composition, Introduction to Business, Oral and Interpersonal Communications, Industrial Mathematics, Accounting, Safety and First Aid, Psychology, Bookkeeping, Health and Wellness, Physics, Sociology, Keyboarding, Leadership, Social Science, Geometry, Accelerated Simulation Mode Training Courses, Test-Taking Strategies, Responding to Emergencies, Algebra, Measurements, Core Values and Ethical Decision-Making, Human Relations, Management, Work Ethic and Self-Discipline, Sciences, Salesmanship, Teamwork Building, Preparation for Employment, and Career Management.

I reported the complete list of courses in Chapter Four with comments that I based on the statements from the employer representatives, but the five most relevant courses also follow.

Computer-Related. The subject area that garnered the most responses from the employer representatives was computer related. One of the interviewees pointed out the extensive need for laptop computers in performing diagnostics on automobiles at his repair facility. Another, who managed an automobile collision repair establishment, informed me that estimating the repair job for a customer, as well as mixing the paint for

the final finish of the automobile, both relied on computer software. These applications substantiate information provided by the Bureau of Labor Statistics which showed that technicians in the 21st century require an adeptness in applying computer-related technology to their duties (Bureau of Labor Statistics, 2011, p.2).

English Composition. The subject that ranked second in importance by the group of employer representatives I interviewed was English. A highly applicable reason for the preference of this course for the automobile repair technicians is the need to explain the repairs they made on the vehicle to the warranty companies. They must be able to clearly document the repairs in order to have claims accepted and paid on a timely basis. Several employer representatives agreed on the importance of English because of the need for clear and concise written communication on internal reports viewed by management and repair orders viewed by the customer.

Introduction to Business. Ranking third in relevance by the employer representatives, was the course Introduction to Business. The general consensus for the preference of this course is to enlighten the technicians about the financial and managerial responsibilities the organization faces. One interviewee even provided me with the daily fixed cost of his operation and emphasized the amount of money he needed to generate before he could break even.

Oral and Interpersonal Communications. The Oral and Interpersonal Communications course was relevant enough to merit a fourth place rank. Although the majority of the respondents stated that it provided a basic benefit, one stated that it held a high level of importance due to the need for effective communication with customers and other affiliates in the automobile repair industry.

Industrial Mathematics. The area of Industrial Mathematics actually tied with the area of Oral and Interpersonal Communications in the number of responses it received from the interviewees. One manager considered it to be beneficial for the technicians to perform diagnostics on a vehicle. Another cited benefits the course provided in the area of collision repair technology.

The data compiled for Research Question Number One came from the responses to Interview Question Number Four and Interview Question Number Five. This data reveals the educational needs employers perceive their automobile repair technicians require for an improved training program. Interview Question Number Four initiated the research by soliciting responses regarding desired knowledge and skills that could bridge the gap and provide a benefit for both the employee and the organization. Interview Question Number Five sought feedback from the respondents after they reviewed a composite list of academic courses that are part of the curricula for associate degrees in automobile repair technology programs at 19 colleges in the bi-state (Illinois and Missouri) area. The composite list consisted of 11 course categories that provided 97 different courses.

Of these specific courses, the interviewees pinpointed 30 that they considered to have a positive impact on knowledge and skills needed by the automobile repair technician. I listed these 30 courses by rank in Chapter Four and based this information on the responses of the 35 interviewees.

Connection between Interview Question Number Four and Interview Question Number Five response categories. Interview Question Number Four was, “If you could suggest something the individual employee could learn that would benefit

them and your organization, what would it be?” Of the 19 Interview Question Number Four response categories I derived, nine of them refer directly to the need for general education courses. These responses signify the requisite for the automobile repair technicians to have the ability to do the following: communicate effectively both orally and in writing, use a keyboard in a proficient manner, understand computer usage, comprehend mathematical applications, think logically and methodically, have an awareness of the principles of business and management functions, think critically and conceptually, project interpersonal relations skills, and be familiar with a secondary language.

Interview Question Number Five was, “After reviewing the list of courses required from the colleges, what are your thoughts?” It focused on obtaining open-ended opinions from the respondents regarding the inclusion of academic coursework that accompanied the technical coursework in the degree programs. I provided the composite list of academic courses offered in the curricula of the programs for the Associate of Applied Science in Automotive Repair Technology programs at the 19 colleges I researched to the employer representatives I interviewed. From the 97 different courses on the list, the interviewees considered 30 of these courses to be significantly applicable to translatable skills for their technicians. Of these 30 courses, 17 of them appeared to contribute directly toward satisfying the desired needs that could benefit both the employee and the organization. These course areas include the following: Computer-Related, English Composition, Introduction to Business, Industrial Mathematics, Oral and Interpersonal Communications, Accounting, Psychology, Sociology, Keyboarding, Leadership, Social Science, Algebra, Core Values and Ethical Decision Making, Human

Relations, Management, Work Ethic and Self-Discipline, and Teamwork Building. A particular example of a specified knowledge proficiency that has the potential to benefit the technician and the organization would be the ability to communicate effectively both orally and in writing. Academic courses cited as being important by the employer representatives and that would contribute to need satisfaction in this area would be Oral and Interpersonal Communications and English Composition. The Caterpillar Company places a high value on the knowledge of English principles and applications in their in-house education program. This academic area is considered critical since reading comprehension of various learning materials is vital in their sixteen-week program (Hitch, 2001, pp. 26-27).

Another example of something cited by the employer representatives that pertained to desired knowledge, which would benefit both the automobile repair technician and the organization, is the subject of customer empathy. There were individuals I interviewed who specifically named psychology and sociology as academic courses that could provide an enhanced ability to understand and communicate with customers. Substantiating their opinions is material on these two courses that I researched and included in Chapter Two and Chapter Three of this dissertation. The only desired benefit not specifically addressed by a selected course was familiarity with a secondary language.

Additional literature sources on the subject of career-technical education have focused on the shift from advancing manual skills to the understanding of principles in the area of science and mathematics (Technical Education, 2012, p. 1). The continuing development of technical applications in automobiles indicates there is a need for

constant upgrading of the automobile repair technology curricula at colleges offering these types of programs.

Research Question Number Two. Research Question Number Two sought to determine the validity of this concept with the inquiry, “How important is it for the employee in the automotive repair (physical and mechanical repair to cars and light trucks) profession to have more than a technically-specific education in order to be thoroughly effective for his or her employers?”

As previously stated in Chapter Four, Interview Question Number One addressed some of the concerns of this issue by asking the employer representatives, “What presently does your workforce do well - as far as their work is concerned?”

Analysis of Interview Question Number One responses. The data I sought from the responses to this question pertained to the positive attributes the automobile repair technicians possessed. The responses I received to Interview Question Number One from the majority of the employer representatives indicated an acceptable level of competency within the automobile repair technician workforce. I obtained 110 different responses to this first interview question and summarized them into 11 categories that specified the following positive traits:

1. They communicate with supervisors and co-workers to support and strengthen the organization.
2. They are on time, do what is expected of them, and provide additional effort.
3. They understand and perform the work required.
4. They understand and use technology and diagnostics.

5. They are versatile and flexible.
6. They perform their job responsibilities in a quality manner.
7. They have a high level of experience and training.
8. They are detail-oriented.
9. They communicate well with customers and with the public.
10. They fix it right the first time.
11. They are ethical and thorough with required documentation.

Of these 11 categories that indicate positive characteristics of the technicians, the following seven categories are either partially or fully attributable to the technical element of their education or training. These categories are:

- A) They are on time, do what is expected of them, and provide additional effort.
- B) They understand and perform the work required.
- C) They understand and use technology and diagnostics.
- D) They are versatile and flexible.
- E) They perform their job responsibilities in a quality manner.
- F) They have a high level of experience and training.
- G) They fix it right the first time.

However, only four of the 11 categories indicate that the technicians exhibit qualities that are attributable to academic coursework. These categories are:

- A) They communicate with supervisors and co-workers to support and strengthen the organization.
- B) They are detail-oriented.
- C) They communicate well with customers and with the public.

D) They are ethical and thorough with required documentation.

Analysis of Interview Question Number Five responses. When I presented the list of academic courses, which are part of Interview Question Number Five, all 35 respondents indicated the technicians required additional academic coursework that included the following subject areas: computer-related, English composition, business principles, industrial mathematics, oral and interpersonal communications, accounting, safety and first aid, psychology, bookkeeping, health and wellness, physics, sociology, keyboarding, leadership, social science, geometry, accelerated simulation mode training, test-taking strategies, responding to emergencies, algebra, measurements, core values and ethical decision-making, human relations, management, work ethic and self-discipline, sciences, salesmanship, teamwork building, preparation for employment, and career management. One representative specifically stated he preferred a technician who completed an associate degree program. This preference gives credence to the definition of formal education in Chapter Two, which states, “A formal education program is the process of training and developing people in knowledge, skills, mind, and character in a structured and certified program” (SIL International, 1999, p.1). Another interviewee cited the benefits of academic coursework by pointing out the importance of alignment when replacing auto body parts. He stated that the newer machinery in the shop provides a lot of directions, but a course in geometry would assist in better understanding the procedure. As I analyzed the responses of the employer representatives, I recognized an indication that all 35 felt there is a lack in the academic knowledge and capabilities of the automobile repair technicians in their workforce.

Research Question Number Three. Research Question Number Three asks, “What, if any, academic skills are lacking?” It is necessary to understand the contributions academic courses can make toward the career of an automobile repair technician in the 21st century. Although electronic modules have replaced some of the mechanical components in vehicles and made their operation more efficient, an advanced skill level is necessary to diagnose problems in automobiles possessing newer technology. This skill level relies heavily on technical knowledge and computer interfacing (Bureau of Labor Statistics, 2011, p. 2).

I discovered an interesting example of this requirement in an interview with an employer representative. He conveyed a situation to me that involved an automobile that required service because its “check engine” light was on, and the engine was not running properly. Through his knowledge of diagnostics and the application of the proper equipment at his facility, he was able to determine that the vehicle’s onboard computer needed reprogramming. He accomplished this diagnosis with software he transferred through a portal under the instrument panel of the malfunctioning vehicle. Upon completion of the transfer, the “check engine” light went out, and the engine ran smoothly. The remarkable aspect of this repair is the technician not only diagnosed the problem with the vehicle without raising its hood, but he corrected it as well. His knowledge of computer applications he acquired in his career-technical education, enabled him to apply it directly to his responsibilities as an automobile repair technician (Alfeld et al. 2006, p.2). It is also apparent that he benefitted from possessing critical thinking skills acquired or strengthened through academic coursework.

I obtained data for my research questions through an interviewing process with 35 employer representatives of automobile technicians who performed physical and mechanical repair to cars and light trucks. The initial question I posed to the interviewees was, "What presently does your workforce do well---as far as their work is concerned?" Although I heard many positive attributes, I also asked them to examine the negative elements of their technicians' performance. In addition, I heard many shortcomings when I asked them to examine the negative elements of their technicians' performance with Interview Question Number Two which was, "What do they not do well?"

Analysis of Interview Question Number Two responses. I detailed a breakdown of the responses to this question in Chapter Four. It revealed the category with the most responses: They are not sufficiently detail-oriented or thorough. Although the technician may be proficient at the basic repair he or she is performing, the employer representatives specify an inadequacy continues to exist. The possession of critical thinking skills addresses this deficiency by contributing to the technicians' ability to evaluate the viability of a solution (Baldwin, 2005, p.1). In 1997, Grubb cited the problem of vocational education becoming distinct from academic education (p. 78). This problem perpetuates because of the instructors who strictly specialize in one area of study; these areas are either technical course instruction or academic course instruction. Goldman emphasized that the employers want the educational institutions to recognize this dilemma and to fully prepare the students to be adequately primed for the workforce (Goldman & Schmalz, 2009).

Contributors to critical thinking. Critical thinking is a complex activity that can assist automobile technicians with repair procedures that require degrees of analysis. It

involves a process in which an individual gathers information he or she ascertains to be pertinent to a situation of concern, strives to arrive at a logical conclusion, and implements the decision necessary to correct the problem.

Business or management classes. Business or management classes have the potential to contribute to critical thinking through exercises in problem-solving activities such as case studies. An additional benefit the technician can draw from academic courses in this area is the ability to understand some of the responsibilities his or her employer faces.

Humanities courses. Humanities course areas such as logic and philosophy can confer critical thinking skills to the automobile repair technician because they provide a level of aptitude that strengthens the ability to conduct analytical processes. Ethics is also a course that falls under the category of humanities. Jones points out that ethics plays an increasingly necessary role for both public and private sector technicians (2002, p. 8). The 2010 National Institute for Automotive Service Excellence Certified Technician's Code of Ethics elaborates on the concept that ethical behavior is a necessity for continuance in the service-oriented field of automobile repair (p.1). Additionally, one of the employer representatives I interviewed identified the area of ethics as the top priority he instills in the technicians employed at his facility. He emphasized he is tolerant of an employee who needs to develop his or her technical skills, but will not accept a low level of ethics in the work environment. The longevity of this individual establishment substantiates this interviewee's statements

Analysis of Interview Question Number Three responses. Interview Question Number Three was, "What do you wish your employees could do or know---that they

presently cannot do or do not know?” It addressed the concern of Research Question Number Three, which inquired about the possibility of the deficiency of academic skills in the automobile repair industry. It complemented the broader focus of Interview Question Number Two, which requested general responses on what did the technicians not do well. In order to determine if the employer representatives’ responses applied to a need for academic coursework for the automobile repair technicians, I categorized the 56 responses from the personal interviews I conducted. The result was a total of 15 categories. The category that received the most responses was, “They need education that will enable them to acquire new skills and will help the organization progress.” This has become particularly evident in the 21st century as organizations decrease their levels of operation. Instead of aligning the employees into divisions of rigidly separate white-collar and blue-collar workers, the two groups should function as teams and have open lines of communication (Lewis, 1998). A technical education that integrates academic coursework enhances the overall skill set the students will be utilizing in their work environment. This results in students who achieve an expansive applied education which can provide them the option to advance into a management position and have the skills to succeed in it (Hitch, 2001, pp. 26-27).

There were eight additional categories that related directly to the need for academic coursework. Of the remaining six categories, three related indirectly to academic coursework. They included the areas of conceptualization, customer communication, and diagnostics. The remaining three categories concentrated primarily on technical skills, but academic coursework could enhance them. These categories included productivity, organization, and teamwork. I detailed all 15 categories and 56

responses to Interview Question Number Three and Chapter Four of this research document.

Implications For Practice

The use of Henschke's Five Building Blocks provides a model tried and tested in the area of adult education (1987, 2011). This application is appropriately referred to as building blocks because it uses a step-by-step method of instruction that is designed to engage adults in learning experiences (Henschke, 2011). It also provides a practice that relates to literature involving focused improvement for adults to learn what is necessary through a productive method of instruction. Although the use of dynamic and creative methods of teaching is beneficial to secondary education coursework, the adult educator is more effective if he or she adopts the role of a learning facilitator (Henschke, 2011). After conducting an analysis of the key elements of this lesson design, I feel that it can be beneficial for instructors in the area of automobile repair technology to apply to their course material. These instructors need to be informed of the importance of the principles of adult education, and be aware that they need to make changes.

Application of Henschke's Five Building Blocks

An initial issue Henschke addresses is the importance of understanding how to design a program that will provide an effective education for students pursuing a career field such as an automobile repair technician (1987). The focus in the design should be on the student, who is viewed as a proactive adult learner (Henschke, 2011). The ability of an individual to master automotive repair skills does not automatically qualify him or her to teach them in a technical classroom environment. This emphasizes the need for the career technical instructor to also embrace the principles of andragogy which will require

him or her to understand that educating the adult learner is not an exact science. It is a combination of an art and a science that is effective when it evolves into an instructional practice (Knowles, 1995, 1996). Henschke elaborates on the importance of the postsecondary level educators having a receptive attitude toward accepting the concept of the building blocks by posing the question, “As you are readying yourself for helping a group of adults learn, what would/do you focus on regarding your – beliefs and notions about adult learners” (Henschke, 2011)?

Beliefs and Notions About Adult Learners. At the outset of Henschke’s Five Building Blocks, he emphasizes the value of taking advantage of the student’s potential and his or her desire for an increasing level of interdependent self-direction (Henschke, 1987). Henschke’s (2011) concept of this learning process applies to the importance of instructors in the field of automotive repair technology adapting to beliefs and notions possessed by adult learners to enrich their lesson. This best practice accentuates that both the technical and the academic educationalists in these programs should stress to the students that all of the coursework involved in the curriculum design assists them in developing an increasing reservoir of experience that can become a vast resource for advancing their own learning. One of the key steps necessary at this point in the process is to relate the instruction to the needs of the learner. To emphasize the importance of addressing the focus of this best practice, Henschke (2011) calls attention to current relevance with the critical question for the adult educator, “What immediate and observable learning needs does this adult learning technique or method meet at this time with these participants?” This activity requires all instructors affiliated with the program to project beliefs to the students that every course in the curriculum is there because it

either complements other courses or provides a necessary element that is essential to developing a skill required for their success in the work environment. An illustration of this application can occur by engaging the student in critical thinking exercises that are usually included in coursework in a business or management class. The need for this skill occurs by comparing proficiency in this activity to the analysis required when the technician has the responsibility to detect the cause of a vehicle breakdown and to repair it in an efficient and effective manner. An additional reason for justifying the need for developing this ability can be found within the data I collected during my interviewing process. Analysis of this data revealed that the category, which included the majority of the deficiencies in the composite automobile workforce under review, was “They are not sufficiently detail-oriented or thorough.”

The overall strategy of the degree program, as well as the individual courses that are vital elements of it, can encourage and integrate the automotive technology students’ emotions if they can envision that the completion of required coursework is contributing toward their self-chosen career path goals. In order for the students to perceive they are making progress throughout the program, the instructors should encourage and reinforce their participation at every step. The role that the instructors have for structuring a learning environment that will nurture and motivate the student in this program is analogous to the links of a chain. Each link must not only be capable of interconnecting with others, it must also maintain strength to pull the student along by instituting positive changes and continuous learning.

Perceptions Concerning Qualities of Effective Teachers. The second building block focuses on the instructors in this field by specifying certain personal attributes

necessary for them to apply to the curriculum. The educators in automotive repair technology programs can provide incremental benefits to the students if they are competent in speaking, demonstrating, writing, and listening.

Interest in the students and the subject being studied. It is critical for the instructor to assess the dynamics of each class group and to determine the lesson blend that will actively engage the students. When this engagement ensues, the likelihood of acceptance and motivation to learn is more probable. As Henschke points out in this area of Building Block Number Two, “Students are quick at determining how interested teachers are in them and the subject being taught” (1987). Although the instructor in the automobile repair technology department is unlikely to teach general education coursework, if he or she supports the need and the application of this area, the student is more likely to accept and to learn the material. Henschke later points out that if this application is not adequately projected, students will perceive the material to be part of a “canned process” that is not relevant to the material they need to learn (2011).

Ability to communicate well. Emphasis is again on communication methods that actively engage students. Whenever possible, the instructors, who provide academic course material to the automotive technology students, should apply the course content to this occupational area. Some programs that have sufficient enrollment, accomplish this objective by having a specific section of an academic course offering dedicated to that particular career field. When this plan is not feasible at the educational institution, the instructor may have the opportunity to review his or her class roster to discover the various curricula the students are pursuing. By incorporating examples that address a work-related issue into the scheduled lesson plans, the instructor is stimulating an

applicable interest of the learners which can enhance their potential for comprehension of the information. An illustration of this situation would occur when the Business Mathematics instructor covers the chapter on decimals. He or she would elaborate on the adherence to minimal tolerances applied during the replacement of automotive engine components.

Good knowledge of the subject. While it would be beneficial for the instructor of an academic course to be completely knowledgeable in the field of automobile repair technology, it is unlikely that this situation will happen. But, if open lines of communication with the career-technical education department instructional faculty exists, the exchange of pertinent information is more likely to take place. If this relationship is developed, the academic course instructor will be more capable of referring to and responding to the areas of interest that relate to this field. The situation of the academic instructor challenged by a question he or she is not knowledgeable about is probable. As Henschke (1987) states in this segment, admitting to the inability to provide the answer and conveying an interest to resolve the concern will retain respect for the instructor and benefit the student. He also points out that an ancillary benefit of this activity stimulates active involvement from the adult student (Henschke, 2011).

Prepared to teach the lesson. This component of Building Block Number Two elaborates on the academic instructor establishing goals for the automotive repair technology students to organize themselves, to provide the materials and techniques to assist them in achieving these goals, and to conclude with an evaluation to determine whether or not the goals have been sufficiently met. A method applicable to fulfilling this responsibility is to assign a project that requires the students to relate the class

material to a problem area in their career field. The instructor then evaluates the presentation of the problem and the application of the solution for their viability and effectiveness. Coaching is an indispensable element the instructor must provide to keep the student on track throughout this assignment. One of the accomplishments likely realized from this type of exercise is critical thinking.

Enthusiastic. The academic instructors are responsible for initiating and transmitting enthusiasm for the course content that is their area of educational expertise. This practice will require them to focus on and to expound on the benefits the automotive repair technology student will derive from involvement in the subject area. Additionally, if students perceive an opportunity to discover new concepts and ideas they can apply to the attainment of career goals, they will be more receptive to expanding their scholastic horizons. An instructor who is genuinely interested in ideas, facts, and the nature of work surrounding the automotive repair technician is more likely to gain interest from his or her students than the instructor who merely considers the automobile as a means of basic personal transportation and projects this unconcerned attitude.

Phases and Sequences of the Learning Process. A critical element of this Building Block encompasses the belief that “learning is understood as a process which has a number of manageable steps in which the learner becomes deeply involved” (Henschke, 1987). The academic course instructors who teach automobile repair technology students will provide meaningful benefit to them if they plan their lesson as a vehicle and a road map to internalize the material. One of the methods that will assist the educator in accomplishing this goal is to apply the use and the proficiency of an area of a

particular knowledge through a process that involves three specific steps. These steps, as they apply to the academic course area of English Composition, are as follows.

Develop. The first step in the internalizing process is to develop knowledge that will lead to an increased level of understanding specialized applications in the occupational area. The basic fundamentals of correct sentence structure require the correct selection and placement of the subject, verb, and object. Comprehending the importance of this written communication arrangement will serve as a key preliminary guide for creating a clear and informative message.

Practice. At the outset of developing this skill, the instructor encourages the automotive repair technology student to experiment with the proper composition of basic sentences. As advancement in this area occurs, the succeeding steps should result in the development of short paragraphs that explain a procedure. Attention to appropriate grammar usage, clarity, and completeness are principal factors in this segment of the learning experience.

Refine. The refining process for this student would involve utilizing this knowledge through the application of the subject matter to his or her specific occupational field. After achieving an acceptable level of proficiency in the composition of sentences and paragraphs on generic subjects, the automotive technology repair students would transition to repair reports. The ability to communicate the described problem, professional diagnosis, and repair procedure in a clear and concise written manner will have the potential to contribute to organizational efficiency and customer satisfaction. These elements are attainable because the repair organization is able to provide accurate documentation and invoicing for the parts and labor involved.

Teaching Tips and Learning Techniques. The traditional method used by many instructors to disseminate knowledge in automotive repair technology education programs is the basic and one-way organized lecture. As Henschke states in this Building Block, there are tools available “to increase the interaction and enrich the internalizing of the information presented” to the students (1987). Since this occupational field requires hands-on participation to perform the job, the inclusion of a visual element to the instructional material provides beneficial details. Three techniques available to enhance the lesson are motion picture and slides, demonstrations, and simulations (Henschke, 1987).

Motion picture and slides. This technique allows presentation of information to participants through both the ear and the eye. Professionals usually direct and produce filmstrips on educational subjects. These filmstrips provide the student the opportunity to view steps of a repair process in a time-condensed version.

Demonstrations. In a demonstration, the automobile repair technology instructor verbally explains and performs a step-by-step procedure that involves the proper method necessary to correctly remove, repair, or install an automotive component. The proper environment for this technique should be in a setting that enables the students easy and safe viewing of the instructor’s motions as they listen to the material presented. The instructor also can emphasize the importance of specific sequences necessary when performing certain procedures that require them.

Simulation. The simulation technique enables the learner to acquire skills in a setting simulating the actual environment involving them. Students in the occupational field of automobile collision repair technology benefit when they are required to simulate

procedures of dent removal, paint preparation, and painting a physically or cosmetically damaged vehicle. Instructors in this field provide students the opportunity to learn and to refine their skills through experimentation on auto body parts and vehicles used explicitly for educational purposes. Many are donations from automobile body repair establishments, automobile dealerships, and private individuals. Upon achieving proficiency in the repair of the test vehicles and parts, the student advances to the repair of damaged vehicles owned by customers.

Implementing the Prepared Plan. As Henschke states, this Building Block likens to “an integration of the explicit and objective subject matter knowledge of one’s practice into the personal constructions and performances of one’s work” (1987, p. 420). In the overall area of automobile repair technology education, the effective instructor must fully realize he or she is communicating with adults, and an important principal in adult learning is the immediacy of application. This educator must focus on facilitating learning for the student rather than simply teaching the material to them. But, if the instructor teaches to engage the students, and the engagement occurs, their learning need heightens. These students will be more likely to learn because they have a goal of being a successful automobile repair technician and expect that this goal is achievable through the completion of the program. Educators in this field can nurture the students’ progress by instilling self-directed learning and by encouraging them to take responsibility.

Conclusions

This study includes findings that contribute to the information base in the area of automotive repair technology. This repair focuses on the physical and mechanical repair profession to cars and light trucks. It melds material I obtained from my literature review

with data collected from individuals who are employed in a managerial capacity in the automobile repair industry.

All 35 employer representatives I interviewed affirmed that it is, at the least, beneficial, and in some cases, an absolute necessity for their technicians to have an academic coursework background. They cited specific situations involving diagnostics that validated these beliefs.

Although mechanical aptitude and a degree of manual dexterity are prerequisites for this line of work, the need for other skills becomes more important over the years as the level of technology appearing on automobiles increases exponentially. Coursework that develops skills in the areas of diagnosis, critical thinking, and communication is a necessity for the technician to acquire and to continuously strengthen.

To effectively complement the student's technical skills, there should be integration of academic courses in his or her postsecondary education. From the data I collected, I concluded that there are many applications of academic skills in the automobile repair technician's work environment.

I will make the information from my research project available to the employer representatives. Also, I will stress the advantages in recruiting automobile repair technicians who possess a diverse set of skills needed for a comprehensive technical education in this area. My research project provided me with the potential to open up communication channels and enabled me to obtain a greater amount of information that I will be able to convey to the educational institutions. Upon analyzing the results of my expository study, the schools may examine the effectiveness of their programs and make

revisions in order to meet the requirements of their students and ultimately the employers in automobile repair establishments.

Recommendations for Further Research

Recommendations for further research involve the academic community that determines the curricula for the automobile repair technology programs at the postsecondary educational institutions. Although I realize it is a tremendous challenge to monitor the effectiveness of the material presented to the students, efforts made to do so have the potential to positively affect them, the employers, and the educational institutions.

One suggestion would be to test a pilot program on academic and technical course integration in an automobile repair technology program. An application of this type of program is an element in a learning community. Although there are different connotations of this term, in the higher education environment, it involves classes linked with the goal of complementing each other.

Another recommendation for further research would be a trial implementation of Henschke's Five Building Blocks in an automobile repair technology program. However, the Five Building Blocks course lacks substantiation for all areas of career-technical education. Although many areas of adult education used it extensively, this course does not have specific research applied to automobile repair technology instruction. Research in the area of course material applications could result in improved teaching methods and in academic offerings. Administrative deans of technical education divisions at colleges and managers in the private sector training departments would have the opportunity to initiate adult education principles, and more specifically, the

implementation of Henschke's Five Building Blocks (1987, 2011). The design of the educational program (at a postsecondary educational institution), or a training program (at a private sector establishment), involving automobile repair technology principles could begin with the consideration of the selection process of the instructors or trainers. Since these individuals would become an integral part of a newly-established or revised program, their receptiveness to different methods of instruction and evaluation are the critical points of concern.

My last recommendation for further research is for the educational institutions, providing automobile repair technology programs, to apply the findings garnered from this dissertation. In conjunction with any applications discovered, they may want to consider making a coordinated effort to establish or strengthen lines of communication with employers of the technicians. An advisory committee, comprised of instructors from the technical course and the academic course areas, educational administrative management staff, and employer representatives, could meet regularly to exchange information that focuses on keeping abreast of changes occurring within the automotive repair industry. This communication could provide direction in determining, and in preparing for its present and future skill level needs.

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Appendices

Appendix A

Interview Questions for Automobile Technician Supervisors and Responses

Complete Interview of Five Questions For Each Respondent

(NOTE: Possible identifying information has been replaced with XXXX.)

Interview #1

1. What presently does your workforce do well---as far as their work is concerned?

(Please elaborate.)

Fix it right the first time. It's something that the car manufacturer grades us on. Our 12-month score is 85%. The top 10 dealers in the nation are at 90%. So, were five percentage points below the top 10 dealers in the nation. It's a pretty good score. The reason why we don't get a better score is because if we have to order a part, and the customer has to bring it back, they don't consider that it was fixed right...---and we take a hit on that. Or, if a customer has a concern that only happens sometimes, if they come in, and the car is not doing it, or we can't verify it, we take a hit on that. Or, sometimes the customer has a concern that is characteristic of the vehicle, or it's a normal condition that they're not happy about---something that it does that they don't like.

2. What do they not do well?

(Please elaborate.)

Sometimes the technicians talk in language that the customers don't understand---if that makes sense. Sometimes they talk in technical terms or acronyms that people don't understand. I think that they'd do better if they talked in more laymen's terms. There are some of the guys that are pretty good at it, but most of them---it's like talking to a doctor.

Around here, they don't always tell us if they get a customer's car dirty. Then we don't know that until you're standing out front with the customer. But, if they would have let us know that, we could have gotten it cleaned up before they came to pick it up. It's inevitable that it's going to happen because the guys are always

working in grease and oil and they're more worried about fixing the car and not small things like that.

3. What do you wish your employees could do or know---that they presently can't do or don't know?

(Please elaborate.)

There are times that they don't go to look to see if there is a known problem before they work on the car. There are times that they don't utilize all of the avenues they have. Most of that kind of stuff is on line now and you can go to the car manufacturer's website and search for a symptom or something like that and it will tell you if there is any known problem. There have been times when we've gotten far into a deal, and then they go to look at that---which they're supposed to do first. The first thing they're supposed to do is to verify the concern, and then they're supposed to check to see if there are any known issues---and sometimes they forget that step. It's something that they could actually discover online because they have access to computers. Everything is computers these days.

4. If you could suggest something the individual employee could learn that would benefit them and your organization, what would it be?

(Please elaborate.)

More computer skills.

These cars have voice control and touch control. They're really moving fast with all of that technology. I think that some of the guys are having trouble keeping a grasp of that and just keeping up with that because it's happening so fast. Your car can be tied in with your cell phone. Some of the new car dashes have touch screens on them and voice command programs. The technology is moving pretty fast and we don't always have the time to keep up with that. They took the mandatory classes, but there's only so much they can do and they probably need more hands-on training. A lot of the training nowadays is rote training so they go on the computers and take a test but it's not actually going through the programs and touching the stuff.

5. After reviewing the list of courses required from the colleges, what are your thoughts?

(Please elaborate.)

Well, first of all, they should be well-rounded. There's no doubt about that. I just kind of made a list of what I consider to be important:

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- * social classes
- * accounting classes
- * business classes
- * leadership classes
- * composition classes
- * big emphasis on computer classes
- * health & first aid classes
- *some math classes

Interview #2

Interview Questions for Automobile Technician Supervisors

1. What presently does your workforce do well---as far as their work is concerned?

(Please elaborate.)

The actual repair of the vehicle, they do very well.

2. What do they *not* do well?

(Please elaborate.)

Communication---which is necessary to do the answer to job one. And in communication, they lack their skill in spelling and English.

3. What do you wish your employees could do or know---that they presently *can't* do or *don't* know?

(Please elaborate.)

To be able to communicate better what they actually did to perform the repairs, and also to communicate better (both the technicians and the service writer) what they did to get to the core problem. The service writer needs to be able to go to the customer and ask exactly what it is in order to have the knowledge of what we're looking for. They need to be able communicate that to the technician, and then the technician needs to be able to communicate back that this is what it was that we did to resolve the problem.

4. If you could suggest something the individual employee could learn that would benefit them and your organization, *what would it be?*

(Please elaborate.)

I would have to say that the academics part of the job more than the skill part. I think that we're learning the skill part of it, and I think that we're getting to the core issues. I think that if the technicians could improve in the area of communication and mathematics, they could get to it faster. Then, the technicians could relate to us (service managers and service writers) exactly what the issue was. So much of it anymore is the electrical part of the job---electrical diagrams--being able to read the schematics. That is such a big part of it. Half of the guys back there have trouble doing that. They drift toward the top three or four guys we have, and ask them which diagnostic chart to follow---and how far to follow

it---what “shortcuts and stuff.” The flowcharts we have are very good. (It says) CHECK THIS CIRCUIT---is it above five ohms or below five ohms? If it’s below, go to step three. It’s so academic and so in order, and they still have trouble doing that. Following directions, I guess. Seek the key things we always look for, and if you do, you’ll get to the right answer---99.9% of the time. You need to be able to follow those charts, and I think that is something we need to do a better job of teaching---follow it---make it happen. Technology is there. It has far and away outpaced everything else.

5. After reviewing the list of courses required from the colleges, what are your thoughts?

(Please elaborate.)

The most obvious is health. With today’s environmental conditions, especially in the automotive field, that is something that should probably be touched on. It hadn’t come to mind until I saw that. It doesn’t appear to be something they dwell on, but we’re working around a lot of chemicals and there are hazards just in the operation of automotive engines---emissions and so forth---so that’s something. I think that the math definitely needs to be addressed, and anything that relates to communication. I think that the electronics is a huge, huge, interest. Everything on these cars now is electronic controlled---everything. I think that’s something I should have dwelled on---but that goes without saying, but it’s extremely important.

Interview #3

Interview Questions for Automobile Technician Supervisors

1. What presently does your workforce do well---as far as their work is concerned?

(Please elaborate.)

They do a quality job. These guys are well-trained in the automobile manufacturer's product. They know what to look for as far as maintenance needs, repair needs, and what kind of problems the vehicle is coming in for. They have a good idea of what repairs are needed to get the car back out on the road again. My guys are on time, and they put in a good day's work. They also, if I need extra time out of them, a lot of guys volunteer to stay late and do other stuff that I need them to do. I have a very good core of guys out there that respond well. I don't get any guff out of them. I don't overtax them or ask too many things of them, so I think that it's fair on both ends.

2. What do they *not* do well?

(Please elaborate.)

Well, sometimes, you feel like you have to be a "babysitter." They kind of "cherry-pick" the jobs where they try to avoid a particular job so another guy will get it. One guy might want a "gravy job" versus one that will "tax" them a little bit. Rather than taking the next job that's supposed to be theirs, they might try to find a way to get around it. They're supposed to go to the computer that displays the jobs, and take what it gives you. That's the only way to be fair to everybody.

3. What do you wish your employees could do or know---that they presently *can't* do or *don't* know?

(Please elaborate.)

Most of them can read and write good. With a couple of them, I wouldn't mind it if they could write a little better---you know, legibly. But most of the stuff is done through the computer so they communicate through the computer and make notes in the computer, so it's eliminated a lot of that. I have a veteran core of guys out there so when it comes to their job, most of them know how to do that. They need to keep up with their routine training from the automobile manufacturer. Part of their daily routine is to put down what they did, what the

job entails, how they came to the conclusion they came to---such as diagnostic codes. They start there and they have a “diagnostic tree” and follow that tree down until they find the problem. I actually have a very good crew of guys.

4. If you could suggest something the individual employee could learn that would benefit them and your organization, what would it be?

(Please elaborate.)

I guess that maybe when it comes to the electronics of the vehicle, some of the guys need to be able to follow the schematics better. They need to get familiar with them so they can learn to read them a little bit easier. They should be sure to use some of the resources they have at hand, and use the technical support team. Sometimes I think that they don't think further when they come across some potential problem. If they'd follow the schematics, they might find the answers they're looking for. They could learn if they use these tools they have at hand more often.

5. After reviewing the list of courses required from the colleges, what are your thoughts?

(Please elaborate.)

With the guys, what I'd be looking for is technical training, maintenance training, and what it takes to keep a car going, and how to perform general maintenance on a vehicle. When I'm looking for a technician, of course, I want someone that scores high on their technical training and I'm usually looking for someone that has gone to Ranken Technical College. Ranken is my main source. Part of that reason is because I've been down to Ranken for training courses when I was a technician and I was pretty impressed with what they've got down there and with what they do and how they specialize in our automobile manufacturer's product. I can also see where English courses, as far as being able to communicate with the customer is a good idea. I know that Ranken does a lot of that with their training courses and with ASM (Acceleration Simulation Mode) training and maybe some of the basics that are very helpful. They can understand what you're talking about and the customer has an idea of what's going on. I mean that all of the techs are pretty good about being able to talk with the customer. Most of my guys, or the core of my guys have been here ten years, or more, so I have a very good group of guys here.

Interview #4

Interview Questions for Automobile Technician Supervisors

1. What presently does your workforce do well---as far as their work is concerned?

(Please elaborate.)

They effectively work together as a team.

What I mean by that is that is two or more techs putting their heads together for a diagnosis to talk about unusual concerns that we run into. We brainstorm together to help improve processes on ways to strengthen customer satisfaction and loyalty. One of the things that I found out that works really well is if I let them study and train together, whereas if I put one guy in a room by himself he might complete only one task. But, if I put a couple of guys in there together, they can bounce ideas off of each other and they'll get through a whole lot more training and they'll come out looking like they absorbed some of it rather than looking like they were stunned.

At other shops where I worked, there's a lot of individualism, and then there's a lot of little cliques. But here, we have ten to thirteen guys that basically, where some guys are stronger. You're always going to have some guys that are stronger in some areas than others. Some guys are going to be good with electrical, some guys are going to be good with transmissions, some are going to be good with drivability. I think that most of my guys are master techs. That means that they are trained all the way across the board in everything. The reason this works well this way is because I can give them any job. I know of people that go to a smaller town to a small dealership and their transmission guy is on vacation---and nobody can touch their car for a week. So this way, I still think that the best thing that we do is working together. So, if someone gets stuck on something, they can turn to somebody else, or another guy. Everybody in the shop knows when you've got a troubled problem in the shop. Our program is continuously at or near 100%---and I believe that is why---because everybody does care about getting the car fixed, and they put aside whatever they've got going on to help each other. I think that's what makes us so successful.

2. What do they not do well?

(Please elaborate.)

What I think is worthwhile pointing out in this area, is that the workforce is getting older. So, probably what we don't do well is to keep ourselves in shape.

I've noticed a lot more physical fatigue, doctor's appointments, people straining this, and pulling that, so I would say that fitness is something that we could do a better job at.

Some of them don't test well. I can remember that one of the very first master technicians that I ever met, wasn't one of the best techs I've ever had working for me, but he was really good at taking tests. So, some of them don't test well, and some of that may be due to not picking up good study habits when they were in school. This is a generation of technicians that has probably seen the biggest amount of change in the last twenty years. When they started out, they didn't have to know how to type and they didn't have to know how to run a computer. It's a lot harder for them now. It's changing so much every day---to keep up. They don't have basic computer skills or keyboard ability. There's a lot of times when I have to go around out in the shop trying to help guys with basic functions of computer programs---not so much as testing and diagnostic systems, but how to use the management system of the computer that they're on.

3. What do you wish your employees could do or know---that they presently *can't* do or *don't* know?

(Please elaborate.)

Well, that kind of comes back on what we don't do well---and that's the computer. They don't have the basic skills of keyboarding. They get stuck when they're trying to set parameters or deal with firewalls on the computers. They're not sure how to set up the connections or download the software that they need, or set up a parameter when something goes wrong---and it's frustrating for me because we have a laptop shared by two guys. Every day, there's an issue with half of them. We have an IT guy, but he's not always able to be spread out enough.

It's important to be able to set up the parameters. A lot of the stuff we do now is with USB ports and laptops. We download information from the car, put it in the computer, upload new stuff, and there are times when you have to know how to get around some of the firewall stuff, set up some of the commands that are needed, and go back in and change it for the next type because they don't all work the same way.

4. If you could suggest something the individual employee could learn that would benefit them and your organization, *what would it be?*

(Please elaborate.)

Well, for that, I think that it's to learn to think logically, and methodically. In the old days, you used to be able to pop the hood open, find the broken part, and replace it. But now, you have to be able to pinpoint the problem. You have to be able to do that by eliminating some possibilities, understanding how the whole system works, what the flow and the progression of everything is because to make money in this business, you have to be able to do that in a timely and accurate fashion.

5. After reviewing the list of courses required from the colleges, what are your thoughts?

(Please elaborate.)

Courses that help with test-taking are important because some of the guys are intimidated by that. They know the information, but they can't seem to get it across in some of the tests they have to take.

I think that Introduction to Business and Business Management is a good idea because they do need to understand what is expected of them and why and how it relates to the real world. Because, they often come in here, and it's not so much now, but I think that some of the guys who have been around awhile seem to think that we're making money, this is a company, and the company makes money, and the guys in the back just work---but there's a lot more to it though.

Interview #5

Interview Questions for Automobile Technician Supervisors

1. What presently does your workforce do well---as far as their work is concerned?

(Please elaborate.)

They're good at teamwork.

They definitely help each other out in hard diagnosis with complicated problems. The advisors work well with the technicians in the area of communication in every aspect.

I think that the group that I have generally cares if it's fixed right or not. They don't try to shortcut. They don't try to rig something. It just doesn't happen.

2. What do they *not* do well?

(Please elaborate.)

Computer skills---as far as the basic computer pc's and stuff like that---Windows, Microsoft---they feel like that's for the younger generation. The younger generation, you'll find, will have more computer skills. They're the ones with the I-Phones and stuff like that and know how to work every application there is. The report-writing and documentation---documentation skills.

3. What do you wish your employees could do or know---that they presently *can't* do or *don't* know?

(Please elaborate.)

Basic business skills and knowledge---sales minus expenses equals the bottom line, not sales minus their pay. They get confused in that area.

4. If you could suggest something the individual employee could learn that would benefit them and your organization, *what would it be*?

(Please elaborate.)

Well, they do pretty good with teamwork---maybe not 100%, but nobody does.

But, maybe to have more respect with the other positions they are working with.

You have advisors, you have porters, you have technicians. If you've never been in the other person's shoes, then you don't understand what they go through.

People take things for granted sometimes without knowing what that other person actually does. If the advisor is facing the customer who is screaming because they had to bring it back because it wasn't fixed right the first time, they need to be a little more sympathetic to the other guys. It's the same thing with the guys who are washing the cars. They shouldn't be treated like they're a nobody because their job is important too---even though it's just washing a car. If we didn't need it, it wouldn't be a job.

5. After reviewing the list of courses required from the colleges, what are your thoughts?

(Please elaborate.)

Well, I didn't know that some of these courses even existed, so I'm kind of shocked by some of it. But, some of these things can be pinpointed, and make sense---like the thought concept of Understanding Business.

Psychology--- could relate to communication coming from that area.

I understand general education to be important to relate to the basics of the car industry.

Is history necessary? If you're going to school to be a technician, I don't understand how that's going to benefit you. What's history have to do with working on cars? The only way I can see where that could benefit you is if you happen to have a conversation at the coffee machine. So, I don't understand some of the usefulness of the courses, but some of it I do. So right now, I'm running about 50-50 on it---I guess.

Basic computer courses, and the management course area, and human relations, maybe accounting, and business management. Is there anything on here about resumes---because these are the things that I would recommend for someone who wants to be a technician I'm already familiar with your mechanical side. Your personal side is what's going to get you the job. What's on the paper, and your personality is getting you the job. You'll be able to show me your skills later. You'll be amazed at how many people don't do that. I mean, I give them some slack, because that's the mindset of a lot of technicians that get hired---but it doesn't have to be that way. It's all about personal presentation.

Interview #6

Interview Questions for Automobile Technician Supervisors

1. What presently does your workforce do well---as far as their work is concerned?

(Please elaborate.)

In my workforce, there are a number of areas. There's service advisors, there's technicians, porters, but I assume that we're mainly focusing on technicians. They do a good job at repairing vehicles---fixing cars, and most of that is attributable to their training and their skillset. My particular group has been trained on everything. There's no specialization---other than by franchise---we do that. Some techs receive training on one manufacturer's vehicles, and other techs are trained on the other manufacturer's vehicles. But each technician is trained "all-around" to be able to work on an engine, a transmission, the interior, air-conditioning---and so on. They're not just specialized. We don't have anyone who just does transmissions, or just heavy engine work.

2. What do they not do well?

(Please elaborate.)

Well, nothing singularly holds true for all of them, but the biggest issue related to their jobs is proper documentation of their work---especially for warranty work situations where we have to document, complaint, cause, and correction. We have to document what resources were used to lead us to the repair. We have to document the proof of what we fixed with some of the equipment we have... To sum things up, not following all of the steps would be something important that they do not do well.

3. What do you wish your employees could do or know---that they presently can't do or don't know?

(Please elaborate.)

I think that they all do know what is expected of them. They know how to do the proper job. I guess that the one thing that I wish is that they truly understood how the customer sees the whole process from their point of view. When the customer pulls in here with their car, the start of the whole process is that if there is an issue with their vehicle, there's a problem that brought them here to start with, so the

customer is in a “problem” frame of mind to start with. The service advisors who work up front can understand that, but the technicians are separated from them. To them, it’s just another car they work on. It’s another car that’s broke. Sometimes they just look at it as a big piece of metal. They don’t realize that the young man, or young woman who owns the vehicle is taking the better part of their disposable income to make the monthly payment on it. I guess that the one thing that I wish that the technicians understood better would be the customer’s perspective---that whole process.

4. If you could suggest something the individual employee could learn that would benefit them and your organization, *what would it be?*

(Please elaborate.)

I guess that you could call it the psychology of understanding the customer---to try to figure out and understand where the “customer’s head is.”

5. After reviewing the list of courses required from the colleges, *what are your thoughts?*

(Please elaborate.)

I can understand the relevancy of all of the courses on here, especially if the end result is an associate degree. I do believe that a technician that comes out of an associate degree program is a better technician than someone who goes to a technical college and gets strictly the mechanical repair training. Part of that refers to what I said earlier about the documentation that is required on the job, the understanding of technical documents such as wiring and schematics, and the ability to use electronic test equipment. All of these things cross over into automotive repair. They’ve got to be able to use a computer to draw the next job, and to look up service bulletins for electronic service information. Most of these courses listed here are good general studies classes that someone needs to be a well-rounded person. I noticed the first-aid classes. We periodically do some first aid training here. We’ve also had CPR classes before and other first-aid classes. We need to always have someone in the place who has an understanding of first-aid. I don’t see anything that I would consider to be unnecessary. I see a general need for all of it. I saw that there were a couple of psychology courses on the list.

Interview #7

Interview Questions for Automobile Technician Supervisors

1. What presently does your workforce do well---as far as their work is concerned?

(Please elaborate.)

They understand their job completely and they communicate well with customers. They interact well with other people. They repair the vehicle right the first time.

2. What do they *not* do well?

(Please elaborate.)

Sometimes we have little issues with time management. We actually have a great group of guys, but I'd have to say that the main issue is time management. Everyone is well organized, but time management would be the main thing that we have to work on.

3. What do you wish your employees could do or know---that they presently *can't* do or *don't* know?

(Please elaborate.)

Well, we have a lot of pretty slick computer guys, but some of the guys could improve some of their English skills, and spelling skills---stuff like that. They have to be able to tell the story about the repair, so creative writing would be helpful. Some of my guys could be a little better at their typing skills.

4. If you could suggest something the individual employee could learn that would benefit them and your organization, *what would it be*?

(Please elaborate.)

Maybe they could benefit from having their communication skills improved upon. Their tone and attitude could always stand to be improved on too. This would apply to communication with customers and other employees.

5. After reviewing the list of courses required from the colleges, *what are your thoughts*?

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(Please elaborate.)

In our line of work, mathematics is very important. English skills are very important. A well-rounded education helps these guys to communicate with other people. They've got to know measurements. They've got to know communication skills. They've got to know all of that stuff to make it.

I don't realistically see the need for history.

As far as the rest of the list goes, accounting---the technicians do some work with that area. It applies to keeping track of the time they spend working on cars. But as far as the rest of this list goes, other than the history courses, I would agree that they help in making a well-rounded technician.

I can see where a physics course can be beneficial too because hybrid and electric cars will require an understanding of the proper handling of them or else they can encounter some serious problems. It will help the technician in being able to communicate these areas to service advisors and customers.

Interview #8

Interview Questions for Automobile Technician Supervisors

1. What presently does your workforce do well---as far as their work is concerned?

(Please elaborate.)

Ethics---they are my number one priority.

I can deal with a guy who may not be the best technician in the world which may result in comebacks to the dealership because they have not done well with the XXXX being documented properly, because I can train in these areas. That is pretty much a priority in this business. You have to document everything you do. We live in a litigious society. People want to sue because you worked on their car. People will try to take advantage of you if you're not good at documenting---not everybody, but there are a lot of people like that. So, ethics are truly my number one priority. I don't feel that this type of business can be a lucrative business if you don't have your ethics. My motto is...So I would have to say that my workforce is very knowledgeable about their ethical practices.

2. What do they *not* do well?

(Please elaborate.)

That is a two-fold question. I try to keep my employees here a long time. If you got fired, it's because you weren't ethical, or you got caught lying, cheating, or stealing---violating the basic principles of ethics. If we practice the motto of doing the job, and doing it right, we can work around any issue. But, let's take a technician who graduated from high school in 1980. Back in the 80's, guys couldn't usually go to college unless their parents were paying for it. There was no such thing as a student loan. There were personal loans, and you couldn't get a personal loan unless you had collateral. Most of the guys that are here, and have been here since the 1980's, don't have a degree, and barely have a high school education. They may be fairly good technicians, but they're not very good in the area of reading, writing, and spelling---which has become very important. Now, in 1985, one of these guys could overhaul a carburetor. He could overhaul what was called a computer command control carburetor. You had a computer, and you had a carburetor. The computer built the carburetor. That was the technology then---and that was really tricky. But, I can't give a 1985 car to a kid who went to school in 2010. He doesn't even know what a carburetor is. I'd

have that kid (who has all the current training under the sun) open the hood of that 1985 car. He would probably say, "What do you want me to do with this?" He would have no idea---so I have to have people with a variety of skills. One guy would be good at one thing, and another would be good at another thing. The older guys tend to be good with the older technology cars, as well as the new because you learn through fruition. In other words you learn what comes along, so it's not overwhelming. So in reference to what they don't do well, they might be phenomenal technicians, and be great with the wrenches, but they don't have good literacy skills. It's an issue---not everybody though. I'm not saying that applies to everybody. I'm not saying that they can't read or write, but if you ever read what some of these guys wrote, you'd understand what I'm talking about. We'll now get that kid who graduated in 2010, and he's all on the computer aspect of it, but he's not so well versed on the internal parts of the motor which gets back to the basics of what the technicians learned in 1980---such as the valves, pistons, and rings. They can do the work. All the technicians can do the mechanical work that comes into the shop area. I'm just saying that the strengths and weaknesses tend to apply to these areas. Some---I can't say everybody, but overall, that's what you see.

3. What do you wish your employees could do or know---that they presently *can't* do or *don't* know?

(Please elaborate.)

I don't think that they understand the legalities of the business or the costs involved in the business.

4. If you could suggest something the individual employee could learn that would benefit them and your organization, *what would it be?*

(Please elaborate.)

I would love to have the technicians write service orders, and have the writers become technicians for about a week. The ideal thing would be to switch various different job functions throughout the dealership because some people think that they have it harder than the other guy. If I could give that guy a week doing this job, a week doing another, and a week doing yet another job, I think that they would have an appreciation for other people's jobs. They could even have my job for a week---not to exclude myself from the idea. I think that it would give them a good overall appreciation of what goes on. They know it, they just don't see it per se. They just don't realize the extent of what a person does. I also feel that

there should be constant training in order to stay abreast of the technological changes that come about.

5. After reviewing the list of courses required from the colleges, what are your thoughts?

(Please elaborate.)

Obviously, you have to have all of the technical courses. Obviously, the area of math is important, and obviously there is a need for computer courses. That area is bigger than you'd think. Now, I do not need science, psychology, humanities, or fine arts classes. Political science would not help, and history would be a waste of time in this business. I would really feel the need for one of the classes listed here which is "Core Values and Ethical Decision-Making. I think that is absolutely number one because this can be a phenomenal business, but it can be a seedy business if you let it become that---does that make sense? For me that's a big issue. I've got good people working here---but it's taken a long time. There isn't anybody here that I wouldn't let work on my mom and dad's car. That's just the way I feel. If you don't mind them working on your mom and dad's car, then they're okay. If I would have concerns about someone working on their car, then I don't need them. I don't want them in the shop at all.

Interview #9

Interview Questions for Automobile Technician Supervisors

1. What presently does your workforce do well---as far as their work is concerned?

(Please elaborate.)

I will answer that with a question. When I look at my work force, I have three components in the work force. I have technicians, I have service writers (or advisors)---people that you talk to most of the time, and then I have parts people. Those three hubs make up the primary workforce in the service department. So, if you're asking what do we do well, if you're talking about the technicians, I guess that we want to focus on that part of the equation. I think that what they do well, and what I really like about this organization, and what I want to interject at this point is that I'm fairly new here...I also went to Ranken Technical College, and I also went to University of Missouri-St. Louis, so there's a little bit of my background. But what I really think that they do well is to work together as a team. I think that they communicate well as a team, I think that they have good energy. I think that they do an overall good job of keeping consistent on their training, and the quality of workmanship that they provide. The specific thing that I might mention is that they use online methods to do more than get computer-based information. We use a computer-based multi-point inspection form. I think that they do a very good job at completing that. We use that tool to do two things with the customer:

- a) Educate them about the status of their vehicle in a very simplistic green, yellow, red, sort of notation. Green is good, yellow is cautionary, and red means that we have an issue.
- b) Then, their documentation of that with some quantitative information such as measurements or tread depths. In this area, they do a very good job.

2. What do they *not* do well?

(Please elaborate.)

I think that some of the things that we don't do well would be that I think that we could do a better job at confirming, which is where I sometimes see a breakdown. That's why I mentioned our parts department. Sometimes we have a challenge in getting the right part ordered. And where I've not fully diagnosed that shortfall involves the question concerning whether it's from the technicians who say, "I'm

looking at this part, and this is what I need.” Or, is it from the parts side, but either way, we, as a business model could do a better job at confirming, “I needed this particular switch, and I ordered the correct switch. Part of that could come from slowing the process down a little and really looking at the schematic in the parts department to see that it’s the part that I surely need. It boils down to an accurate confirmation of parts ordered, because it is specific to that. It’s actually a double-edged sword when I think of the thing that we don’t do well is to kind of “stop the presses” in a timely fashion. What I mean by that is that sometimes I really appreciate our guys’ desire to fix a car by “diving in” to get it fixed, but sometimes we have to stop and re-evaluate our diagnosis for two reasons:

- a) Are we going south, when we should be going north? In other words, could we be misdiagnosing the car, but more so on the side of keeping the customer in the loop.
- b) The technician will get so engaged in trying to fix the car, he will forget that we’ve got to update the service writer, who then updates the customer as to the status of what’s going on.

So, that’s what I mean by the double-edged sword. They care wonderfully about fixing the car. You’re here until 6:00 to fix the car, but the customer is out there looking at their watch wondering what is taking so long. That’s not really a bad problem, but it is something that’s a communication issue. The other thing we do that involves a communication issue is that we don’t use the computers. I’m not talking about the multi-point form, I’m actually talking about industry-specific software that they don’t fully utilize. We use a program called Reynolds & Reynolds or ERA. They should do a better job of putting their stories in the computer. That’s a little bit of a different level of documentation. Not to be speaking out of both sides, but I think that they do a good job of checking, but I think that we need to do a little bit better of a job of telling our story in the typing. I think that part of that comes from typing skills, or the lack thereof.

3. What do you wish your employees could do or know---that they presently can’t do or don’t know?

(Please elaborate.)

I think that if they could type better (and I’m a victim of that myself), better typing skills combined with grammar and spelling. There are documents that we would type up to produce and give to a client so we shouldn’t misspell the word “alignment” or “diagnosis.” I don’t think that would present a professional image. Even though they fixed the vehicle properly, the customer reading that piece of paper might think, “Hmmmmmm,” so it doesn’t look very good.

4. If you could suggest something the individual employee could learn that would benefit them and your organization, what would it be?

(Please elaborate.)

Focusing back to item number three, it would be better keyboarding skills. That right there relates to the fact that technicians all work on the idea of time. Time is money. They might not like to type in a story because it takes time because they're not proficient at keyboarding. We need to start emphasizing to our technicians that the keyboard is a tool like the screwdriver, but they don't make that connection, but they're getting there. It's interesting when you see things from my point of view...when you see a guy who is 45 years old and working on a car, and you see a guy who is 22 years old and working on a car, and even some of the guys who are in the 30's, you'll see that many of their keyboarding skills are much better because they are used to it. They've been on computers. They grew up around them in high school, and many of them have some college where they gained experience with different computer applications. Another thing I think that they could use that would make them better would be an understanding of the business model of what goes on---such as what do we do. We are a service department. We fix cars, but ultimately, we are serving consumers. And again, that's not a rampant issue, it's just a general overview from a guy who has seen 60 different technicians from three different locations in my career---probably more technicians than that. I was a technician myself for about six years at a dealership, so I actually did that end of the job. Although many of them do, but if more of the technicians could just sometimes see the concept better of really what we're doing. Yes, they produce hours for their income to put bread on the table, but we serve customers, and sometimes that isn't clear enough. The ultimate goal is to serve more customers, and the better we serve them, the more bread we'll have on the table.

5. After reviewing the list of courses required from the colleges, what are your thoughts?

(Please elaborate.)

I didn't fully understand this, but I think that I did. I can just give you the general pros and cons. Overall, it's good when we think about a technician. I went to Ranken Technical College, but I did not go through their two-year program. I did their night-time program because I worked full-time during the day, so I earned the certificate in automotive maintenance---not a degree per se. But I did earn my four-year degree at the University of Missouri-St. Louis. Business was actually my major. I look over these, and the courses are good. As I was looking at the list and going over them, I think that the courses are good, and again when we look at courses like Introduction to Accounting and Introduction to Business, I

think that it helps round out their understanding of business. I'm not trying to say that they don't "get it," but I've dealt with technicians who are 65 and technicians who are 16, and I've seen a lot of skill levels between those ages.

The Human Relations course "jumped out" at me when I think about the dynamics of working with service writers, and serving customers. I kind of tell the guys that they are on stage every minute they are here. You have to realize that somebody could be watching what you're doing, or observing you, and I think that is important to understand. In the words of Walt Disney, "everything speaks."

As I continue to go through these courses on the list, and they all looked pretty good, and I got to the computer-related areas, and I guess that maybe I passed them up because I already covered keyboarding, spelling, and grammar, then as I continued to go through the list, I realized that the composition classes were in the back part of the list. Those kind of jumped out at me. With computer applications, when you get into the mega-shops when the technicians are 200 or 300 yards away from the service manager, so the ability to communicate without being face-to-face is huge. Whether that communication is by phone, or by text, and more often now, it's becoming more and more prevalent for the communication to be coming through the computer. Here, these guys aren't exposed to that because they are about twenty feet away. But, I have been in a shop where a guy is 200 feet away, so you have to use technology for efficiency, and use that technology productively and correctly so that somebody else doesn't have to fix grammatical issues or spelling issues so that you can properly get your information to the next party so that they can do what they need to do. And again, all industries are going to be computer-based. Even the diagnostics on the automotive side, you are using laptop computers, and something that I hadn't noted on here is that you have to understand the "dos" and "don'ts" of computers. If you hook up a computer the wrong way on a car now, you can "fry out" a computer---not your computer, but the car's computer. Obviously, that would be a bad thing.

With the general rounding out of the courses as I went through them, I kind of wondered about trigonometry. That, and calculus for a technician, but they are obviously good classes. Again, you're dealing with some mathematics. It isn't the days of yesteryear where we used to overhaul a lot of stuff. Component replacement is the more preferred method today versus overhauling transmission where you had to measure down to hundredths or thousandths of an inch, but that goes more along the diagnostics side of things. So, that's kind of my "rounded out" view of the list, so I hope that's what you were looking for.

Interview #10

Interview Questions for Automobile Technician Supervisors

1. What presently does your workforce do well---as far as their work is concerned?

(Please elaborate.)

We repair body parts, replace body parts, refinish body parts, assemble and disassemble cars. They have a particular strength in repairing things. It takes an art to repair things to the point of where they were before they were in the accident—from being bent up.

2. What do they *not* do well?

(Please elaborate.)

They don't communicate with the office well at all---when the car is going to be done, what they're doing to the car, or what stage of the repair the vehicle is in. I have numerous meetings where I feel like I'm talking to myself.

3. What do you wish your employees could do or know---that they presently *can't* do or *don't* know?

(Please elaborate.)

I wish that they could communicate with customers better than they do because when they use the terms that they refer to when they repair the car, and try to explain it to the customer, the customer has no clue as to what they are talking about. Communication with the customer is definitely an issue.

4. If you could suggest something the individual employee could learn that would benefit them and your organization, *what would it be?*

(Please elaborate.)

Be upfront more about what's going on in the shop because it's a communication thing. They need to help keep us informed. We have a cycle time that we have to repair cars by. They don't look at the cycle times to make sure that everything is getting done the way it's supposed to be done. The cycle time is very important to the insurance industry. Cycle time refers to an example of a situation of a car coming in on a Monday, and if it's a 4-day job, it should be done on Thursday.

We write that on the outside of the repair order jacket---that it needs to be done by Thursday. If they would take a little more time to look at that it would benefit us because the cycle time is something that we get graded on by the insurance companies. If the car is written up as a 20-hour job, it needs to be out of here in four days or five days. They determine the number of days by the amount of hours that is written up on the vehicle.

5. After reviewing the list of courses required from the colleges, what are your thoughts?

(Please elaborate.)

The key thing I can point out here is that my bodymen are older, so they didn't grow up in the computer age. Everything we do in the shop now is computer-based. Taking computer classes now to get into our industry is very important. We used to estimate by hand, but now everything is computerized---from estimating the job, to repairing the job, to mixing the paint for the job. So everything is computerized. Nothing is done by hand anymore. I was glad to see that area about computers, because a lot of people in our age bracket didn't really know what computers were. Although I had typing in high school, we had manual typewriters. We didn't even have electric typewriters. But now, I use a keyboard all day long. My bodymen use a keyboard, but they struggle, because they never had the keyboard to use before. We use computers, and math---because everything we use today is in the metric system. We pull measurements on the frame, we pull measurements on the unibody, and everything is metric system referenced. English is something they will never use.

Interview #11

Interview Questions for Automobile Technician Supervisors

1. What presently does your workforce do well---as far as their work is concerned?

(Please elaborate.)

Hands-on stuff---as far as actually repairing the car and getting things done, and scheduling their time---for the most part---except for a few of them. They also do their job to the utmost of what they can do---as far as skill and ability. We do have guys at different pay scales, so you can expect different levels of efficiency from each guy---due to their pay scale and their skillset---what you would expect for their pay level. If you're paying a guy $\frac{3}{4}$ of what the general journeyman scale is, which is what the top guys are making, so, if you're paying a guy $\frac{3}{4}$ of that, you can only rightfully expect $\frac{3}{4}$ of that amount of work from him---and quality also.

2. What do they not do well?

(Please elaborate.)

A couple of them have slight communication problems insofar as relaying to me what they need, or what they need to get a car done. In reference to computer skills, I don't think that anyone in here has good computer skills from the schools they went to, and it does come into play here on the frame rack. I have to go out and help some of them with the equipment. I was in the shop just a year ago, so I've been on both ends of the situation. Also important is managing their time sometimes---as far as the process of repairing a vehicle. It's a step-by-step process. Multi-tasking would be another thing that some of them don't do well---working on more than one car at a time efficiently.

3. What do you wish your employees could do or know---that they presently can't do or don't know?

(Please elaborate.)

Obviously, their computer skills need to be a little better, but nobody has been sent to training---which would make a difference.

In the body shop industry, estimates are written off of estimating systems such as Mitchell, Autotext, CCC. A lot of times there are aspects of the repair that aren't

included, and for them and for the shop, it would make it more profitable if they would know some of those things. For example, if you change a tailgate on an SUV, they're not going to include putting the glass in it unless you put it down there. Essentially, they need to include the operations needed to get the most time and profit out of the repair job would help. So, they need to include all of the operations that are involved in the process of repairing the vehicle for the application that they are doing. There are different applications for different vehicles. Documentation fits in there too somewhat. A lot of that comes as time progresses. I had a technician tell me a long time ago that you're going to make as much money with your pen as you will with your hands. So, a lot of it refers to the idea of working smarter, not harder.

4. If you could suggest something the individual employee could learn that would benefit them and your organization, what would it be?

(Please elaborate.)

A lot of that goes along with what I was saying about learning more about the operations of the shop---learning more and getting a better understanding of how long it's going to take you to do a job, and what they're going to pay you to do a job. Sometimes you're going to ask for four hours to fix a dent, and they're only going to pay you three, and it's only going to take you two, so that's the whole point. Try to get whatever you can out of the insurance company. Being able to explain to the insurance company or adjuster the reasoning behind why you're asking for what you are---as far as time-wise to repair this or replace that, and breaking that down into simpler terms for someone.

5. *After reviewing the list of courses required from the colleges, what are your thoughts?*

(Please elaborate.)

One of the things that I see that surprises me is that there is a lot of geometry involved in auto body. There are a lot of angles and measurements required, and I don't see any geometry classes listed---or maybe trigonometry. I do see the Survey of Calculus though. There's a lot of geometry required in the body shop side of the business. Now, mechanical-wise, there's a lot math involved there too because you're dealing with a lot of electrical issues as far as ohms, and how far to push one---that fits into the body shop area too.

Computer courses should be required. With a lot of the guys out there now, to check on certain repair procedures, you have to go online a lot of times to get specifications or certain repair procedures. A lot of that is involved.

Also, you need to have a good base of communication because that's obviously the basis of what we do.

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Business and management are good because you should be able to know what it takes to do in the office, to an extent---along with what goes on in the shop. As I mentioned, I've been on both sides.

Psychology and sociology are very good also because you have to relate to a customer or an insurance adjuster. If you're a mechanic, you have to relate to a service writer to relate to the customer aspects of the job that need to be repaired--to put it into terms that they can understand in order to justify what you're trying to sell them.

In reference to the area of health and wellness, you need to be in shape because we do a lot of manual labor. Even mechanics do a lot of manual labor. I've seen a lot of them struggle, and they'll end up with bad backs or on the job injuries from being overweight and out of shape. It does affect a lot of them. Not that it's a requirement, but it would definitely help every worker to be in better shape. I think that it would help every company also. It could help keep their health insurance down.

Interview #12

Interview Questions for Automobile Technician Supervisors

1. What presently does your workforce do well---as far as their work is concerned?

(Please elaborate.)

They are always able to get along real well, and help each other out. They are pretty good about staying on task, and doing what they need to do. Their quality of work is generally pretty good. We're a little different here. I basically go through the work and quality control everything that goes through the shop to make sure that we don't have any issues that could arise.

2. What do they *not* do well?

(Please elaborate.)

It varies from person to person. As a general group, they don't really push. We're not a flat-rate type of shop, so we're a little more lax than other places--- industry-wise. So, productivity probably isn't where it should be. There is a lack of knowledge in some cases in the areas of computers and electronics. My guys do a lot of wiring stuff, so a couple of them could be better at it.

3. What do you wish your employees could do or know---that they presently *can't* do or *don't* know?

(Please elaborate.)

Generally, in this industry, you have problems with electrical areas and electronics. It's really hard to find somebody who is a good drivability technician. Drivability refers to situations such as if you're driving down the road, and the car "chugs" a little bit, or the "check engine" light comes on, and being able to diagnose the problem. It basically boils down to the problem of the situation where a technician experiences the situation of the "check engine" light coming on, so they just note a code, and put a part on it and hope that it fixes it---instead of actually doing the full diagnostic work and finding out what it needs, or doesn't need.

4. If you could suggest something the individual employee could learn that would benefit them and your organization, *what would it be?*

(Please elaborate.)

Time management---that's one of the biggest things. Obviously, with an increase in productivity, there's more work that can get done, so everybody will be better off.

5. After reviewing the list of courses required from the colleges, what are your thoughts?

(Please elaborate.)

I suppose that a history course helps "round out" the employee. I think that the courses could be improved if they were a little more directly related to the technical aspects. I'd like to see a core curriculum focused on the automotive field. If the courses could relate more directly to the automotive technical field they could be a lot better.

Interview #13

Interview Questions for Automobile Technician Supervisors

1. What presently does your workforce do well---as far as their work is concerned?

(Please elaborate.)

I'm not sure what to tell you about that question. I'm upset with them most of the time. But, I guess that if I had to tell you something definite, I'd say that they follow the information that I put on the repair orders.

2. What do they not do well?

(Please elaborate.)

The main thing that I would have to say about that question is that they lack a decent work ethic. One time I was really busy with customers at lunch time and I asked one of them to get something for me, and he said, "I still have three minutes left on my lunch break."

Another problem I have with them is that they don't keep an eye open for extra services or parts that a customer's vehicle might need. They should be doing that when they are working on the vehicle. Even if the customer brought the vehicle in to get something else fixed, they should inspect the vehicle to see if there is something else that needs attending to. It's something that we could at least let the customer know about---even if they don't want us to fix it at the time.

In general, they don't keep busy enough to get enough vehicles finished throughout the working day.

They also don't provide complete information about what they did on the vehicle, and what the vehicle might need now, or in the future. It would help if they did that because I could let the customer know that, and possibly get more repair business.

They don't use the diagnostic equipment enough. I've got thousands of dollars invested in diagnostic equipment and computer software that could help with the repair job, but it usually sits around collecting dust.

3. What do you wish your employees could do or know---that they presently can't do or don't know?

(Please elaborate.)

This might sound overly sarcastic, but they need to use their common sense more to figure things out when they're working on a car. This goes back to your last question about using the equipment. They need to really use the equipment to their advantage. It would actually make their job easier, and make this place run more efficiently.

- 4. If you could suggest something the individual employee could learn that would benefit them and your organization, *what would it be?***
(Please elaborate.)

I would want them to learn to use the power equipment more. Although I have air-powered wrenches that would make the job go easier and faster, I caught one of them the other day using a hand wrench instead---which was slower and harder to work with. They could also familiarize themselves with the computers and diagnostic equipment.

They could also try to be more efficient in getting the repair jobs done so they don't have to spend so much time on one job.

- 5. After reviewing the list of courses required from the colleges, *what are your thoughts?***
(Please elaborate.)

I don't see any reason why a mechanic needs a history course.

A psychology course might be helpful when it comes to dealing with the customer and trying to figure out how to find and correct a problem.

There needs to be a common sense course listed on here.

Some extra emphasis on being able to use, and be comfortable with diagnostics would help them on the job.

They need to learn what a proper work ethic is.

They need to learn business principles to better understand what I have to go through as the owner of this place. It costs me \$800 every day I'm in business. If I only take in \$750, I lost \$50 that day.

Interview #14

Interview Questions for Automobile Technician Supervisors

1. What presently does your workforce do well---as far as their work is concerned?

(Please elaborate.)

I hope that they do everything well.

They are very good listeners. The common sense thing goes a long way when you're working in this business. You have to take what a customer is trying to tell you and roll it into what the problem is with the vehicle. I have several guys working here who are full master technicians who are very good. I also have light-duty technicians, and a lot of those guys are actually doing very well also. The majority of my work force is good at pretty much everything. They are good at listening to the customers, diagnosing the problem, and performing the needed repair on the vehicle.

2. What do they *not* do well?

(Please elaborate.)

The lube technicians, which are the younger generation---I have a heck of a time getting them to work---to concentrate, to be here every day, and to show up on time. I'm about as easy-going as you can get as a manager. All I expect for the most part with these guys is to be here on time, give the company the eight hours that it deserves---and then go home. That is sometimes the biggest feat---just getting somebody who really wants to work. It primarily applies to the lube technician area---getting somebody who wants to show up and work the full day. They want to take ten smoke breaks a day, and be the first one out the door, show up late, or leave early---or overextend their lunch break. That's probably the biggest problem area that I have. It could be defined as personal discipline---or a sense of self-worth. When comparing them to my older guys, you can tell that there is a complete "night and day" difference.

3. What do you wish your employees could do or know---that they presently *can't* do or *don't* know?

(Please elaborate.)

I guess that at this point, I wish that I had guys that were a little better at diagnostic work. That goes along with the fact that I only have two diagnostic guys here. . . . Besides the two diagnostic technicians, the other guys are mediocre. So I'd like for them to take more classes---and learn as much as they can learn. You can never know too much. That's kind of the philosophy that I live by---take advantage of everything that's out there. They're only going to better themselves. Some of them have the attitude that if they have to take training classes, they want to be paid. I try to explain to them that they are bettering themselves when they take classes sponsored by the automobile manufacturer. But you can't get some of them to buy into that idea. I did everything possible when I was working as a technician---all the way up until now. I believed that anything you can do to better yourself is going to help you be way ahead of the game.

4. If you could suggest something the individual employee could learn that would benefit them and your organization, *what would it be?*

(Please elaborate.)

Learn everything that you can learn.

Take advantage of everything out there that you could possibly learn. There's more than enough manufacturer training, and there's more than enough of other kinds of training that could provide the opportunity to better yourself. It's worth it---and it's priceless.

5. After reviewing the list of courses required from the colleges, *what are your thoughts?*

(Please elaborate.)

It looks like all of the courses could be helpful, and they're designed to better the technician.

I'd say that any of the sciences would be helpful, although I don't know if they'd be able to get much out of history or government. But, business, bookkeeping, leadership---that's all good to know.

You need communications skills, writing skills, English skills, interpersonal communication. But come to think of it, I guess that maybe history and government courses could play into the whole area of beneficial educational courses. I suppose that there isn't anything on the list that isn't a good idea. Physics is a fantastic idea. It's one of the classes that I took at Ranken Technical College. It was an awesome class. What that course does is to get your brain working and gets you thinking about how doing one thing affects another.

NOTE: This interviewee has an Associate of Applied Science degree in Automotive Technology from Ranken Technical College.

Interview #15

Interview Questions for Automobile Technician Supervisors

1. What presently does your workforce do well---as far as their work is concerned?

(Please elaborate.)

All areas---everybody in the workforce does their job well. They are all competent and experienced.

2. What do they *not* do well?

(Please elaborate.)

Sometimes they don't show up---and don't call in when they're going to miss work.

A few of the technicians don't interact with the computer enough for their benefit and the company's benefit. I guess that a couple of them just don't understand it good enough.

3. What do you wish your employees could do or know---that they presently *can't* do or *don't* know?

(Please elaborate.)

Computer literacy---more basic knowledge of computer operations would be a good thing. It would be a good thing to study up on the body shop oriented programs. It's not just the Internet type of usage, it would also apply to estimating and frame-pulling types of programs.

4. If you could suggest something the individual employee could learn that would benefit them and your organization, *what would it be?*

(Please elaborate.)

It would help to have a higher level of computer literacy and become more knowledgeable of measurements and provide a higher quality of input about the repair that is needed for the customers' cars.

5. After reviewing the list of courses required from the colleges, *what are your thoughts?*

(Please elaborate.)

It would be a good thing to learn at least a little about salesmanship, accounting, and bookkeeping. That goes along with the business concept of “it takes money to make money.”

I would strongly recommend a course like “Introduction to Computers.” In general, I would suggest more computer classes than any other area. I know that St. Louis Community College at Florissant Valley offers a computerized estimating class. A lot of my guys know how to write estimates. They just don’t know how to put the material into the computer the right way. The way that most of them learned how to do estimates was to refer to a book. They’d look up the car, and the repair needed in a book, and it would tell you how much to charge for each operation. Now, you just put the information in the computer, and click on what you want it to do. Maybe it’s just too simple for them.

Interview #16

Interview Questions for Automobile Technician Supervisors

1. What presently does your workforce do well---as far as their work is concerned?

(Please elaborate.)

The majority of the workforce is experienced enough to handle any of the work that comes into the shop. They can handle jobs that range from tune-ups all the way to engine rebuilding. They are experienced with all aspects of mechanical work. Their experience allows them to handle the entire gamut of work required.

2. What do they *not* do well?

(Please elaborate.)

Speed of service would be the main issue there. Most of them don't work with enough intensity. They don't care if the job that they are working on takes all day to complete. In this business, managing time, and being efficient is what is necessary to grow the business. We need to grow the business to make more money for them and for the company.

They don't work well together as a team.

It's not really an issue of time management—they just don't care about how long it takes to do a job.

3. What do you wish your employees could do or know---that they presently *can't* do or *don't* know?

(Please elaborate.)

Perform repairs on a more efficient basis.

4. If you could suggest something the individual employee could learn that would benefit them and your organization, *what would it be?*

(Please elaborate.)

Teamwork.

5. After reviewing the list of courses required from the colleges, *what are your thoughts?*

(Please elaborate.)

Actually, I'm not a big "fan" of those college courses. My feeling is that hands-on experience is more important. I'd rather have a technician who comes to me who has had ten years of previous experience than someone fresh out of Ranken Technical College. When it comes to the technical knowledge that is needed to perform diagnostics on a vehicle, that is something that can be gotten from taking seminar classes that are offered by the company that supplied us with the equipment. Previous experience is critical. There are some situations where they need to go to a computer, but they don't have to be experts at it. In general, they can function well with very little computer knowledge.

I don't think that teamwork is something that can be learned in a course---and that is what I really need.

Interview #17

Interview Questions for Automobile Technician Supervisors

1. What presently does your workforce do well---as far as their work is concerned?

(Please elaborate.)

They are very detail-oriented---and that's because the tasks require it. They are also thorough in their evaluations of the repair needed for the vehicles. They understand that the work they do is important. So when the customer brings their car in, they realize that this business would not be in operation if we didn't have customers. By and large, most of them work exceedingly hard. That means that some of them are willing to work 14-hour days. If someone needs their car on Saturday night, and we normally close at 7:00, most of them would be willing to stay until 9:00. They are dedicated and devoted to the job they do. They're all committed to accepting the fact that they don't have all of the answers. If they don't know the answers, they ask for help. That, I think, is the largest part of their success. They are not so arrogant that they think that they know the answer to every repair problem.

2. What do they not do well?

(Please elaborate.)

They don't always present a professional appearance---whether it's themselves, their work area, or their tools.

They're not always good time managers.

I would also have to say that they don't always possess critical thinking skills that will help them get to the right conclusion about the necessary repairs for the vehicles.

3. What do you wish your employees could do or know---that they presently can't do or don't know?

(Please elaborate.)

Of course, that varies by the individual---in all honesty. There's not one thing in particular that stands out from one to the next.

Write legibly. As basic of a requirement as that is, they all don't always do that.

Another thing would be the ability to follow directions. They should know the parts that they need for the repairs, and make a list of the parts required before they start working on the car. Make sure that you have all the parts that you need before you start. Make sure that you know the full scope of work that is required so that you don't get into the job, and then realize that you're missing something.

- 4. If you could suggest something the individual employee could learn that would benefit them and your organization, what would it be?**
(Please elaborate.)

Better communication skills would be the main answer to that question. They should be able to convey their thoughts in a manner that makes sense and is logical.

- 5. After reviewing the list of courses required from the colleges, what are your thoughts?**
(Please elaborate.)

We don't really need deep thinkers here, but we do need good communication skills.

I don't see a lot of reasons why sociology, history, or political science are important to a technician.

I don't think that a college composition class is really necessary because most of the information that they need to convey can be done in single sentences.

Communications classes would be good, but not necessarily college composition classes. The information that they need to know to do their job is on the repair orders.

They should be very computer literate. They should be able to access the Internet to be able to get information that can help them to diagnose and understand the repair that is needed. So, the computer courses need to be good, specific courses designed for the technician to use in their work environment. With today's cars, you can't get by without a good understanding of how computers interact with the cars.

Health and first-aid courses are a good idea because I've seen technicians develop back problems due to being bent over the car throughout the day to perform the repairs needed.

Interview #18

Interview Questions for Automobile Technician Supervisors

1. What presently does your workforce do well---as far as their work is concerned?

(Please elaborate.)

I kind of think that they do everything well. Otherwise, they wouldn't work here. Three of them are ASE certified. The fourth guy, the youngest one, he went to Ranken. He doesn't have his certification yet but he doesn't do as much as the other guys. The other three have been here quite awhile. ... But really, they're all three very well-trained. My youngest one---he's good. I just kind of keep him busy with services and brake jobs and front end work. He doesn't do much of the diagnostics, but what he's done up to this point, he's done fine. Some of them preceded me. They were keyed into this job before I came along, so they're all very good. They take care of what they do. We have no employee issues in here in the way that the business is run. It's nice. They complement each other. I believe that they could get a job any dealership if they chose to. That's actually a little easier in some ways because a dealership is geared to one type of car. The guys in the shop like ours have one of the tougher jobs there is---as far as being a technician. They work together pretty well. We stay away from some of the higher end cars. There are certain cars we don't work on like Audis or Jaguars. We might change oil on them. In fact, practically every car make out there has been through our doors at one time or another. But some of them I try to steer away from. You can't do everything to all of them anymore. I would say that they are versatile because they all do a variety of things. They are willing to go to the computer to resolve problems that come up on cars.

2. What do they not do well?

(Please elaborate.)

As far as the mechanical aspects of their jobs, there isn't really much that I can respond to that question. I think that they're all really good. There's not much I would want to change. I think that the couple of guys who have been here longer aren't as interested in going to training classes anymore---... I think that he's figuring on staying around another five years. I think that's a natural thing as you get older. They still do the ASE tests and that sort of thing. We also get a class through CarQuest that they'll go through. The younger guys are more geared to

going through AC/DELCO training, and as I said, CarQuest has quite a few classes they offer us. One of the guys could be better personality-wise because he's not really good at talking to customers. He really doesn't care to, but the way our shop runs, the guys mainly work on the cars, and I really handle all of the customer stuff---like making appointments and everything beyond working on them much. But I suppose that's not real critical. So, I guess that you could boil it down to that I'd like them to be more customer-oriented. He wouldn't work out well in a shop where there is more customer contact. But, that all goes through me, so it doesn't matter.

3. What do you wish your employees could do or know---that they presently can't do or don't know?

(Please elaborate.)

Well, it's all stuff that I have control over, and I run the shop the same way XXXX (the previous owner) always did. It would probably make my life easier if I would have the guys more involved in looking up parts and running the shop a little bit. I put so much on myself that it's hard for me to keep up with four guys, and I guess that it would be nice if I had the guys doing more stuff, instead of just doing the technical stuff. But, I guess that I probably wouldn't change the way things work right now.

4. If you could suggest something the individual employee could learn that would benefit them and your organization, what would it be?

(Please elaborate.)

The main thing I guess would be that training benefits the employees, and obviously the shop. If the older one was a little more interested in computer training and stuff like that. The older ones who have been here the longest aren't looking to be doing much of that stuff. They don't take the ASE test anymore, and there's a lot of value to having the ASE certification. That doesn't necessarily make them a good mechanic. That's the way they feel. They're both competent mechanics, and they don't place much stock in what's on paper---and stuff like that, but that stuff is so important. The younger guys---they're eager in doing whatever I ask---as long as there is training. We do have to get XXXX to do his ASE stuff. I have to push him to do that a little bit.

5. After reviewing the list of courses required from the colleges, what are your thoughts?

(Please elaborate.)

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Well, I think that they help make the technician a well-rounded individual. I know that Ranken is the college that I have a little experience with. They run you through a little bit of everything. They require some math and some English and all that. I was a graduate of Bailey Tech years ago, and I took straight automotive courses, and I think that it served me okay. But there's some stuff here---like I can't see that spending time going through history and those sort of classes would be worthwhile. Definitely computer stuff is good now---which you didn't have when I was going through. English is good to have. It helps them communicate. Any kind of communication class is probably good. Anything that pertains to automotive repair is good. So English and some math classes are good. There's some math involved in some of the stuff that you have to do, but not much. And computer classes are good. Even a typing class is helpful. In my position it makes me wish that I would have taken typing when I was in school. I never thought that I'd have a job where I'd have to type. Now, that's one of the hang-ups in the flow of the shop. It's me---when it comes time to make out the ticket for the customer. I think that a school like Ranken that requires other stuff, rather than straight automotive is a good thing for the individual---especially nowadays. It still helps if you're a well-rounded individual. It helps in the way that you work in your job and the way you can relate to other people. Anything in the area of communication is good, but I don't know how much science stuff can help---or history.

Interview #19

Interview Questions for Automobile Technician Supervisors

1. What presently does your workforce do well---as far as their work is concerned?

(Please elaborate.)

Some of them are very detailed. Obviously, I have some people who I have to work with to get more “dialed in” as far as detail goes. Most of the guys are very good about that because in this business, you have to be very thorough. Some of them are very thorough with paperwork, and with others, you have to keep working with those things. As far as their use of English, these reports don’t have SpellCheck on them so it’s interesting with the spelling and grammar that ends up on some of them that we have to go through and clean up. They’re brilliant on cars. I wouldn’t want anyone else working on them, but if the customer sees the way the ticket is written out, it wouldn’t be good.

They’re very knowledgeable about what they’re working on. We hire a lot of people with a lot of experience. We pay a little bit more than most dealerships. All of our guys have a lot of experience, so as far as that goes, we’re good. So, the pay scale and longevity---being at the same place and doing what they expect from each other is a plus. They support each other. They know each other very well, so they support each other in terms of their strengths and weaknesses. When there’s a lot of turnover, you’re always trying to figure what you’ve got, and who’s working next to you, and what to expect from them. They communicate well. With most of our guys, I’d feel very comfortable with them coming up and talking with our customers. I’d have no problem with that. Some of them would be better face-to-face than writing their English, but that’s something we have to clean up.

2. What do they not do well?

(Please elaborate.)

Written communication---areas such as English, punctuation, and spelling would be an area. Some of the guys need to be a little bit more thorough, but I’ve got one guy who is probably overly thorough. He’ll do a battery service, and I think that there will probably never be corrosion on the battery again---it’ll be better than new. When he does a diagnosis, he’ll check everything to a certain point, and then he’ll go back over the vehicle just in case he may have missed anything.

I have a higher amount of respect for the guys here when I see some of the guys at other dealerships and when I do interviewing.

3. What do you wish your employees could do or know---that they presently can't do or don't know?

(Please elaborate.)

Most of the people who are “turning the wrenches” are not understanding the business as a whole. They don't understand that a simple half-hour job translates into income. They don't translate the dollars very well so they don't always understand why it's such a big deal when you deal with an extra hour or two of work that you're dealing with an extra 200 to 300 dollars. They're used to what they deal with and they're used to their environment and don't always understand what it means on the other end. So, because of the labor rate, we have to give some stuff away to make the customer happy and sometimes we have to give some of the automobile manufacturer's assistance which hurts their pay. They don't always understand the business part of it. In summation, they don't always understand the business and customer side of things. There's a lot of other stuff. I don't hire a lot of new people, so not a lot of people are breaking into the business. As far as what most of my guys know, I'm blessed in that area because I don't have a ton of training to do. If you're constantly breaking in a new crew, or starting a new dealership, it's painful. There's a lot you wish they would know.

4. If you could suggest something the individual employee could learn that would benefit them and your organization, what would it be?

(Please elaborate.)

Everybody wants to pick on the service advisors. They don't think that they do their job well. They think that they make too much money, but none of the technicians want to do the service advisor's job. They kind of generally understand, but if you could actually put the technicians in the advisor position for about a week, I think that they'd have a better understanding and appreciation of what all goes into it. We all get used to what we do, and we don't think outside of the parameters---the other things that go along with our jobs. So I'd have to say that the employee and the organization would benefit if the technicians had a better understanding of all of the facets of the business.

5. After reviewing the list of courses required from the colleges, what are your thoughts?

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(Please elaborate.)

I can see where some things might not seem like they would fit in that well for technicians, but I find that the colleges that seem to require more, well their people seem to be at a different level. I've got a person that was here that we hired who went to Ranken, and I've got another one who went to a technical school in Chicago, and there's definitely a world of difference between the two. I've interviewed people from the Chicago school, and I've interviewed people from Ranken and you can tell that there is a big difference. I don't know that if it's because the reputation that's out there or if it's that people understand that at Ranken, you're going to have to do a lot more to get through it. So, some people choose other options, but some of the people who were from this area, went to the Chicago school, and then came back to this area. So, I don't know if they didn't go to Ranken because there's some of these things that they might not have been able to get through---so they went to the other school. I don't know what their thoughts were.

I think that an English course is a good thing for some of these people because the technicians write the story on the computer. It's sort of a legal document. Those who couldn't punctuate and spell made my job a lot harder when I was an advisor. I worked out there for years. I'd have to re-do the whole story because you don't want the customer to see what they wrote. I can see where an English composition course makes you able to put thoughts into words and punctuate correctly.

In reference to computer knowledge, there's not a whole lot that they have to do. They have to be able to navigate through three or four screens, but then, all of your diagnostic equipment and all of your books these days are all on the computer. So, you have to be able to navigate through all of that stuff. The higher the level of computer skills the technicians have, the more efficient, and the better they will be.

Mathematics may have been a little more critical than it is now. Everything is on the computer now. They provide so much information. You can check voltage and things like that, but there's not a lot of conversion. The computer does most of those kinds of things.

With the English composition, you're also doing a lot more reading than you used to have to do. You have to make sure that you're understanding everything that you're reading. So, reading and writing is important to the technician's job.

Interview #20

Interview Questions for Automobile Technician Supervisors

1. What presently does your workforce do well---as far as their work is concerned?

(Please elaborate.)

Any kind of mechanical work---from computer diagnostics to rebuilt engines and rebuilt transmissions---you name it, we pretty much do it. We don't get into body work---other than bolt on a mirror or a headlight assembly or taillight assembly---stuff like that---door hinges, maybe. We pretty much all go to classes all of the time---several times a year, really. There's a lot of new technology out there, and we have to stay up with it. They stay up with current technology. I have certain guys who do certain things, but as far as the general jobs, we all do it all. I have one guy who does computer diagnostics, and another guy is better at doing ball joints and engines and the heavier work. The workforce complements each other's skills. We have access to online diagnostics for repair data---which you almost have to have. They use diagnostic data to their advantage. I have a diagnostic guy who knows a lot about computers.

2. What do they not do well?

(Please elaborate.)

One of my employees does diagnostics better than the other one. One of them is better at manual labor than the other one. One is lacking in computer skills.

3. What do you wish your employees could do or know---that they presently can't do or don't know?

(Please elaborate.)

I would like for XXXX, who is my brother, to do some of my business functions. He is the main mechanic here. If he could do more of what I do, I wouldn't have to be here as much. I would like just for XXXX to be more involved in the business end of things---but not the rest of the employees.

4. If you could suggest something the individual employee could learn that would benefit them and your organization, what would it be?

(Please elaborate.)

More managerial skills---when I'm up in the front end of the business (the office area), XXXX does a pretty good job of keeping the guys in the shop going, but if I could get him up front to do some of the write-ups, I wouldn't have to be here quite as much. I'm not able to take a 4-week vacation. A week off is about as much as I can get. XXXX doesn't like to work in the front end of the business, but he'll do it when I'm gone because I ask him to.

5. After reviewing the list of courses required from the colleges, what are your thoughts?

(Please elaborate.)

Computer courses would be very helpful. None of us in the shop are really experienced at computers. So, I can see where some of these computer-related courses would definitely be helpful. We're an AC/DELCO shop---what they call a TSS (Total Service Support) shop. In regard to automobile technician training--we get all of that for free. We can go to as many courses as we can handle throughout the year. They probably offer 25 courses a year. They do have some managerial courses too---bookkeeping related---as part of their program. I've been to a few of those.

I'm not so sure about the usefulness of history, but I would think that mathematics would be good. Computer courses would definitely be useful. Everything is on the computer nowadays. There are some cars that have eight to ten computers on them.

The main areas of the list that I think would be beneficial would be computers and math.

Interview #21

Interview Questions for Automobile Technician Supervisors

1. What presently does your workforce do well---as far as their work is concerned?

(Please elaborate.)

They usually work well together---as far as helping each other out who have different skill levels. The older guys are willing to help the younger guys, and want to see them improve. In general, they complement each other's skill level.

2. What do they not do well?

(Please elaborate.)

There's too much gathering in the morning. The first thing, they go through a ritual of getting their coffee and socializing---especially on Monday when they talk about what they did over the weekend. It's kind of the same scenario after lunch---getting them to get back into the work mode. Along with that would be the parts counter. When they go up to get a part, they'll sit there and chat, or lean on the parts counter for awhile. We're trying to modify that as well. In general, there's a problem with having conversations with co-workers instead of doing their job.

In reference to the area of skill level, in trying to figure stuff out, they will spend too much time on something. Then, they might end up putting a part on that doesn't fix the problem. In doing the test drive, they don't drive it far enough to make sure it's fixed. Then the customer will come back a day or two later. Then we'll end up "eating" some of the repairs. That results in our expenses going up. That type of problem could be called inexperience---that occurs with some of the younger guys usually. I've asked them to ask some of the older guys to drive the vehicle for them to make sure that the customer's complaint was verified and repaired.

3. What do you wish your employees could do or know---that they presently can't do or don't know?

(Please elaborate.)

I'd like for them to try to be more efficient by being able to work on two cars at once---to develop the ability to multitask. It's like some of them have blinders on

and can only do one thing at a time. They can have two cars, and be draining the oil on one car while they're doing something else on the other car. Or, they could be flushing the transmission on one car while they're putting a radiator in another car. That depends on if we have the room in the shop. For the most part, there's some of them that can do it, but there's some that obviously can't.

4. If you could suggest something the individual employee could learn that would benefit them and your organization, *what would it be?*

(Please elaborate.)

Learn to multitask. It would increase their efficiency and thereby increase their paycheck, and increase our hours---which equates to labor dollars. It would also be beneficial to the customer too because it would get them in and out quicker. More training would help. There's some specific training such as emissions-related repairs, evaporative training that involves fuel systems. There's also the electrical area---and a lot of that is tricky, which the younger guys don't always have the training or knowledge. The evaporative/emissions area of a vehicle requires a lot of knowledge, so extra training would help out there.

5. After reviewing the list of courses required from the colleges, *what are your thoughts?*

(Please elaborate.)

The first ones I see that would help would be:

Preparation for Employment

Occupational Leadership.

Introduction to Business would give them a little bit of a foundation of what goes on in a dealership. Fundamentals of Speech would also be good for them.

Interpersonal Communications would also be helpful or Oral Communications. I think that these types of courses would help them in their job as a technician.

Almost any computer course would help because a lot of the stuff on cars is computer-related nowadays---even simply being able to use e-mail. Accessing websites and some of the basic computer applications depend on computer knowledge. A little psychology probably wouldn't hurt them. Some courses in the social/behavioral science area would probably also help them to be able to communicate with the customer better and understand the repair order and what they need to accomplish. For example, it would be important that they would understand that the customer has been hearing noises, and it's their second time back---and they're getting frustrated because they just bought the car. The technician should understand that they need to take a little extra time to find the problem---or find somebody who can help them find it.

Preparation for Employment would be a good course that could improve their work ethic a little, and they'd have a better idea of what the owners and bosses of a business are looking for.

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There can be mathematical applications in the technician's job. I don't think that there's a need for a course as deep as calculus, but there are definitely some mathematics involved.

Anything that is related to the electrical area---such as being able to read electrical diagram would be important to know. They need to know how to work with electronics so they know how to measure and read ohms and use different test equipment.

Interview #22

Interview Questions for Automobile Technician Supervisors

1. What presently does your workforce do well---as far as their work is concerned?

(Please elaborate.)

They do a broad range of auto repair such as brakes, exhaust, tires, alignment, tune-up, fuel system work, steering, suspension---practically every type of maintenance and repair that a vehicle needs. We specialize in brakes and exhaust systems---custom and factory. We also do catalytic converter replacements. We also do fluid changes. We're good at alignments because we have an alignment machine. We also do engine diagnostics. We don't do rebuilding, but other than that, we're a full-service shop, and I think that we do all of those things I mentioned pretty good.

2. What do they *not* do well?

(Please elaborate.)

I would say that the worst problem they have is their time management in the bays. To elaborate on that; the technician may have 2 or 3 different cars they are looking at and working on at the same time, and then choosing which car to start on, when to walk away from it to start or finish another job to get that car out. So the problem would be in their area of multitasking. I have to stay on top of that situation very intensely for them to do that. In my opinion, I think that technicians that have been in the same shop for "x" amount of years (2, 3, or 4-plus years) should have a better idea of how things need to move. That's probably the main thing I would say is their downfall. I continue to have to go out there and coach them and tell them which car needs to be worked on when and where and how, and for what reason it needs to be done first, second, or third. So, I'd say that is the worst problem area. They're all pretty much on time for work, but prioritizing seems to be their problem.

3. What do you wish your employees could do or know---that they presently *can't* do or *don't* know?

(Please elaborate.)

That would have to refer to the time in which they do their jobs. My technicians know how to work on the vehicles, it's just that the labor times that the guide calls

for. Sometimes they cannot meet or beat the average amount of time indicated. It sometimes takes them a longer amount of time to finish a particular job. They just need to be able to maybe be able to step back and take a look at the big picture because sometimes they get involved in something---and get lost in it. You could call it the need to be able to conceptualize---they need to be able to stand back, take a look, and be able to walk back to it. If they did this, I think that they would be able to improve in this area.

In the area of analyzing the problem, one of my technicians is very good at that, but another technician is not as good at it. As a diagnostic technician, one of my guys would barely be up to par. I would like for him to increase his knowledge of the scanning equipment that we use to diagnose a vehicle and know what to look at on the vehicle that correlates with the problem he is trying to figure out. He may have to ask another technician, "What am I looking for?" To sum it up, he needs to be skillful at a higher level.

4. If you could suggest something the individual employee could learn that would benefit them and your organization, what would it be?

(Please elaborate.)

Take training courses that are offered by our affiliated vendors and the company sponsored courses. They offer specialized classes for air-conditioning, suspension, diagnostics, and new systems that might be coming out on the market for newer vehicles---such as air-bag systems. I think that if they were to take these classes and try to learn about new systems, I think that they would have a better understanding of them in the real-world shop. Knowing about the basics of problems would help them diagnose the vehicles correctly. If they would do that, they could help themselves which would enable them to make more money---which would help the shop make more money.

Another thing that they need to work on is written communication---reading, writing, spelling, and proper grammar

5. After reviewing the list of courses required from the colleges, what are your thoughts?

(Please elaborate.)

Computer-related courses are definitely important because the technicians use the personal computers all the time for things such as diagnostics, or for looking up any kind of issues that the customer conveys to us that they have experienced. Computers, in today's day and age are probably important for just about any job. There's probably not a single job where computers are at least not semi-important.

In regards to the English and communications area; reading, writing, speaking--- those are all very important because the technicians' job involves all of those things. It involves being able to fill out a ticket properly, legibly, and correctly, and being able to spell the words of the parts and labors that the job requires---and being able to elaborate on those issues when they come up. I as the service manager, need to have those skills to be able to sell the job, and a lot of times I have my technicians speak to the customer. They don't do that all of the time, but there are times when they do speak directly to the customer. So, for them to speak clearly, make sense, and use proper grammar would obviously be a very good thing in that situation so they don't look at us like we're a bunch of dummies. So, I would say that English and communications would be very important. Now, getting into the higher levels of it---to where you're worrying about every detail of how the English language works (such as adverbs, adjectives, and all that kind of stuff), I don't think that it's that important for them to understand things at that level, but to be able to speak and communicate what they're trying to get across is definitely a must. Also, having knowledge of English Composition is important for reading and writing reasons is important because I've noticed that you can have a technician that can work on almost any car and diagnose any problem, but you're usually hard pressed to get a technician who is good in that area who can also read and write good and legibly and who can communicate exactly what they're trying to get across when they're trying to explain something to you. I can show you some of the write-ups that my technicians have done, and there are many examples of where they can't spell some basic words---even the word "basic" would probably be spelled "basik." I think that a lot of the people who become technicians are those who didn't do the best in high school or college, but they learned how to use their hands---and that led them into becoming adults who aren't the best at reading, writing, and speaking. I have a technician who can hardly read and write. But, I don't think that there's a single car that he can't fix. But, if he could read and write, the issues that I have with him would go away. I have to spend time asking him a lot of questions because I'll give him a simple item to fill out, and either I can't read it, I can't understand it, or it's not filled out correctly. That causes me to spend time going over the item when I needed to spend time putting together an estimate and speaking to the customer, but instead, I have to spend time with the technician so he can "decipher" everything he wrote down. That's why English Composition caught my attention---because of that specific reason. I've worked at two other shops before, and I have to say that the technicians that I work with here don't measure up in that category. Often, if there's something that they have to write down, if it's important, I'll write it down for them. When they do have to write something down, they will ask me how to spell words, so I'll spell words for them so they can write them down correctly. This is definitely an area where I wish they knew things like this. It would make things much easier and smoother for me.

If, you asked me about these courses being important for a service manager, I would say that every area would be important to be successful and wanted to learn and know the most that they could know to do their job. There's no way that a

technician could become a good service manager---especially with all of the bookwork that I have to do, the numbers that I have to deal with, and dealing with the customers. You have to have an idea of how to do all of those things in the first place, and how to manage your time doing it.

The area of accounting and bookkeeping is something that I learned how to do here, but that wouldn't necessarily be something that would be beneficial to the technician. Accounting would be helpful if the owners asked me for my help in doing the books. It would be something that as a service manager, I'd be able to point out things such as, "we spent too much here," or "we need to level this number out here."

An understanding of the economy or economics would be beneficial for anyone who might become a salesman or even represent any kind of business.

A Career Management course would be a course that might not be important to someone who just wants to be a technician, but for someone like me, who wants to be a leader in the business---a person who handles the sales and the customers, the books, the numbers, the money---I would say that this would be something more in the area that I do. The technicians---I don't care if they know how to keep track of money. That's not their job. I don't really care if they know how to "crunch numbers" or know how to start their own business, or manage a business because they don't have anything to do with any of that. But, if they aspire to be a shop owner, a shop manager, or even a service writer, these things would be important to know to be able to do the job that I do---to do the job at a higher level like I do---or the owners who do the accounting for the business at home---to keep the books straight.

For technicians, I don't think that the Behavioral Sciences, Social Sciences, Humanities, and Fine Arts areas are nearly as important for their jobs. Although, I can't say that I would completely rule them out because I would want somebody who can understand how it is to be a person who has to deal with other people and deal with (and understand) society the way it is. But, as far as the specifics of History, Government, and Political Science---that doesn't really come into play in their job very often---or even at all. I don't see many times where knowing about U.S. History would help them, or knowing something about politics or political science would really help them. I would say that these areas are probably pretty low on importance.

I would say that the areas of psychology and sociology could be useful.

I would say that computer-related courses could definitely benefit a technician because they do use a personal computer. Anytime that a car comes in where they have to diagnose a situation where the "check engine" light is on, they are on the computer. They have to go through the system, they have to get on the Internet and pull up different sites, they have to type in what they need and what they're looking for, and be able to navigate through the different pages of information because you can type in one code for a "check engine" light, and you can come up with 20 pages of information that you may have to read through and test on the vehicle so being able to correlate that to the shop would be extremely important, so I think that computer literacy is important---without a doubt.

Anything under the first-aid category is definitely important. We obviously work in a potentially dangerous environment with a lot of tools, equipment, fluids, and open flames from torches and welding. So, anything that has to do with first-aid, safety, physical well-being---I would think to definitely be important. If the technicians knew first-aid, and one of them got hurt, another technician could go and help that person, so that would be an important thing. An Introduction to Health & Safety course would be extremely beneficial---considering the environment. I guess that the Lifetime Wellness course could also apply to a technician because they work a lot with their hands and their backs. They're lifting, pulling, and tugging, so I guess that anything that would help them help their physical well-being would be a good idea. In general, anything in the first-aid category looks like it would be something that could benefit a technician. As far as the area of mathematics is concerned, that does apply to a technician. Numbers are a major thing. I don't think that they have to know calculus or geometry, but a basic understanding of math would be helpful because if they're trying to crunch numbers out there, as in a situation where they're trying to measure the distance between a certain part and another part---and trying to figure out if it's right or not---so I would say that basic mathematics would be a must. In regards to college algebra, I took the course, and I can't think of how it could relate to be directly beneficial to a technician. We do deal with fractions and tape measures, so I suppose that algebra could come into play. If the industrial math course deals with things such as micrometers, that would probably be the most important math course for the technician to take. I don't think that anything requires trigonometry or calculus though. We use ball joint micrometers, which aren't the easiest thing to read and figure out, so if you don't have a good understanding of fractions, you won't really understand how to read these types of micrometers. When I went to Ranken, we spent a whole day working with and reading micrometers. They felt that was something important. A lot of the fluids that we work with apply to physics---like the physical makeup of the fluids. The question might arise about why automotive coolant isn't good anymore---as in what is preventing the temperature level of the coolant from going down to negative 20 degrees. Although they don't have to have a full understanding of physics, but if they did, it might help them figure out what the problems to the vehicle may have been caused by the coolant being bad. So, the Technical Shop Physics course would seem like it would apply directly to a situation like anti-freeze. It sounds like it is a course that could help the technician in the diagnostic process and could help him explain to the customer why their water pump failed prematurely. He could refer to the coolant and hydrocarbons; so I could see where that could benefit the technician.

Interview #23

Interview Questions for Automobile Technician Supervisors

1. What presently does your workforce do well---as far as their work is concerned?

(Please elaborate.)

Well, I have technicians who would rank in the category of being elite, and also technicians who rank in the category of basic. But overall the trait that applies to them on an overall basis is that they try to be thorough by trying to get to the root of the problem rather than just analyzing the surface of the problem. In regards to the actual hands-on aspect of their work, I have two technicians who are very good at the automobile electrical systems. Then, I have two technicians who are good at the basic mechanical jobs. We are above average, in fact leaders in the area of diagnostics. We can do major as well as minor repairs. We have a job out there right now where we're pulling an engine out of a car. So, we can handle engines and transmissions that require major and minor repair. We can cover the areas of routine services, major mechanical repair, and we are heavy into diagnostics.

2. What do they *not* do well?

(Please elaborate.)

My technicians are marginal on their housekeeping responsibilities. I have to watch them and prod them to keep their areas straightened up and organized. But, I have to admit that I take the housekeeping duties in my shop a notch higher than most shops.

I also have a technician whom I have to push to attend continuing education classes.

3. What do you wish your employees could do or know---that they presently *can't* do or *don't* know?

(Please elaborate.)

In general, I want them to continue the areas of continuing education coursework out of their own desire instead of my mandate. In this business, you either move forward, or fall behind. There is no standing still.

4. If you could suggest something the individual employee could learn that would benefit them and your organization, *what would it be?*

(Please elaborate.)

The general answer to that would be “anything that would make them more effective at their job.” Continuing education would be the primary thing that would benefit them and this organization.

I currently have a technician who should be more proficient with using computers. We are now fixing cars over the Internet. We had a vehicle that couldn't pass the emissions test because the check engine light was on. It was on because of a code for an oxygen sensor. But, the oxygen sensor was not the problem, it was the software in the vehicle's computer. It was set too tight. It was necessary to rewrite the software in the computer in order to loosen up the test parameters. We accomplished this by plugging into the Internet, taking a credit card and buying a flash file (just like you can buy a music download---we buy an information download). This gives us access to the website. This gives us the manufacturer's approved repair in the form of an electronic flash file. We then download that from the Internet through the interface modules into the diagnostic plug of the vehicle which is under the dashboard. It then goes into the vehicle's computer and rewrites the calibrations in the computer. That then stops the false code triggering, that then keeps the light off, and that allows the vehicle to pass the emissions test. We fixed this car without raising the hood. If you have a technician who is good with a hammer, wrench, and a screwdriver, but doesn't know enough about a computer, he won't be able to fix a vehicle such as this one. Electrical knowledge is important for an automotive technician to have. Speedometers and brake systems on cars are now dependent on electrical systems.

5. After reviewing the list of courses required from the colleges, *what are your thoughts?*

(Please elaborate.)

The automobile repair industry needs people who are literate and proficient in areas like mathematics and computers because that's what the industry needs. Some of the past practices of the education system were to put people in auto shop who were almost illiterate---who couldn't read or do math. (This was detailed in an article titled, “Stop Dumping On Us.”)

I don't see where an American Government or American History class would help an automobile technician.

I do see where anything related to the ASE (Automotive Service Excellence) would be beneficial.

The area of core values and ethical decision making is very broad---so it's hard to say if that would be helpful. Maybe somewhere along the way in a technician's

career it would be important, but not initially. Come to think of it, I had a very talented mechanic who after four years, I sent him on his way. He was a very talented mechanic, but he was short on core values and ethical decision-making. He would try to do things where he didn't care if it cost the customer money---as long as it worked out to be beneficial for him. That didn't agree with my ethical values. I got tired of overseeing that situation. ...

I can see where all of these courses would be of benefit to make someone a well-rounded person, but I don't think that they are high priority to the competency of an automobile technician.

I feel that you can overwhelm a technician who is going to college if you make them take a lot of extra courses to the point that they don't have time to learn the main area of what they went to learn---which is automotive technology.

I think that the business courses listed are too broad.

Everyone needs effective communication. I had a technician that I had in my employment for five years. He was one of the hardest working persons you would ever meet, but his reading and writing skills were very low. He managed to keep his job with the attitude of "I will do anything you want me to do as best as I can." However, you couldn't have him go over and plug a diagnostic tool into a car. He was an "old school" mechanic. You have to match the work required to the skills that the technician has.

If you are going to come into this industry as a technician who wants to make a good wage, and if you can't do computers, you are definitely out of the "game." If you can't do computer-related applications, you will always be at the lower end of the pay scale, and you will always be a follower---and never a leader. My experience and knowledge in that area has enabled me to work primarily in the office. That is important since much of the technician's work is physically demanding---and I'm getting too old for that. I have one fellow is working on his situation, but he allowed his education to get behind and his body to get too large, so he had problems working on some auto repair jobs---especially when he needed to do something under the dashboard. So that is where I see where a Lifetime Wellness type of course could help.

In regard to a physics course, there's probably not too many situations where someone can walk out to a car and say, "that class I took in physics is going to help me fix this car." But, that's also like trying to determine when a hammer will pay for itself. I don't know the exact answer to that question, but I know that you can't work without one. In my opinion, physics can be something that can help you figure out a problem that the other guy couldn't figure out. You can apply physics to the speed of a car, the ratio speed of the wheel, and that the drive shaft is turning three times faster than the wheels, so you can apply the frequency of the noise and determine if the problem is coming from the driveshaft or the wheels.

The use of mathematics can apply to the electrical load of a vehicle. It can also apply to the gear ratio and driveshaft speed. It can help you determine what the gear ratio the differential has. Knowledge of algebra can help you determine a vehicle's gas mileage. I think that calculus and trigonometry is more useful for engineers---rather than technicians. But I think that basic algebra and basic math

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can make a difference in a technician. It can separate the technicians from the one who has to ask the questions from the one who can answer the questions.

Interview #24

Interview Questions for Automobile Technician Supervisors

1. What presently does your workforce do well---as far as their work is concerned?

(Please elaborate.)

Our shop is definitely known for the quality and satisfaction we put into our repair jobs. Our goal is to have zero “comebacks” or customer returns---and we’re very close to achieving that. It’s very rare that we have any issues. Most jobs that are of any size at all get detailed before the vehicle leaves the shop. We provide an extra little service like that to make sure that it’s what it needs to be before it’s delivered. My employees go above and beyond the normal job responsibilities of an auto collision repair shop. We strive to achieve the “wow factor” when a customer get their vehicle back. My employees have a strong belief in high quality standards in all aspects of auto body repair. They are highly trained. If there is something that they need to take or even want to take, I provide for it.

2. What do they *not* do well?

(Please elaborate.)

As a team, they need to be better at being organized---knowing where every tool is. I’d like them to buy into the concept of “continuous improvement.” Due to time constraints that we’re often faced with, they are not as efficient in applying procedures that could save time. It’s kind of a “Catch 22” situation. Every aspect of the business could be improved if we strengthened our shop organization principles. Our paperwork processing could also benefit.

3. What do you wish your employees could do or know---that they presently *can’t* do or *don’t* know?

(Please elaborate.)

Sometimes it’s difficult to keep up with the changing technology of the vehicles. There are some changes to the vehicles every year, so sometimes technology gets ahead of the technicians.

4. If you could suggest something the individual employee could learn that would benefit them and your organization, *what would it be?*

(Please elaborate.)

I believe in cross-training, so even my paint technicians are learning to do estimating. When you learn estimating, you can go into customer service. That's one of the most important steps in being able to take care of a customer when they come in the door. The main auto body technician I have already does estimating and does deal with the customers. He could learn more on the suspension and alignment side of the business.

5. After reviewing the list of courses required from the colleges, what are your thoughts?

(Please elaborate.)

I had a technician who had a hard time in the area with human relations. He wasn't a very good people person. The interpersonal communications course could have benefited him.

I can see where these introductory courses in the business areas could help a technician to understand what makes a business successful. If they wanted to become a manager at some point, the Occupational Leadership course would help. A composition course is a lot about writing, and if you know composition, it can help you understand writing too.

Critical thinking is real important in our business.

Every technician in this business needs to know how to use a computer.

Practically all of the information we use to repair a vehicle comes from computers now. You need to know how to use a computer.

Anything in the area of first aid, health, or safety is important in this business. I know that in the SWIC auto body program, a lot of the first month of the coursework is dedicated to safety.

Math is important, but not necessarily calculus. A technical math course would be good---especially if it was designed to fit the occupation.

Physics can be more important than math. Again, if the course was structured to involve auto body applications, it could definitely help the technician.

At least a Fundamentals of Chemistry course would be important to the painter to understand the paint products that he is using. It was a real eye-opener to me when I learned the difference between "high solids" and "low solids" paint.

A "high solids" paint has larger molecules. It involves the chemical properties of the paint that we use.

Interview #25

Interview Questions for Automobile Technician Supervisors

1. What presently does your workforce do well---as far as their work is concerned?

(Please elaborate.)

Our shop has a lifetime transferrable warranty on the auto body work that we do so I would say that the main thing we do well is to be attentive to detail. All of our staff is ICAR (Inter-industry Conference on Auto-collision Repair) certified. Our employees are well-trained in the technology that is required in this industry. They are familiar with the qualities that high-strength steel has and also of the alloys. It's an evolving industry and our employees are dedicated to doing their best to evolve along with it. I would also add that they do their utmost to do each job perfectly.

2. What do they *not* do well?

(Please elaborate.)

I don't think that they empathize in their jobs enough. They don't meet the customer, so there's a disconnect. They need to be more of the mindset that they should put as much detail and attention into the repair of the customer's vehicle as they would do to their own. They all possess a high degree of workmanship, but there's still that disconnect. It needs to be more important to them to think of the customer. Sometimes I detect a militant attitude in the shop environment with some employees.

3. What do you wish your employees could do or know---that they presently *can't* do or *don't* know?

(Please elaborate.)

They don't have extensive knowledge of the mechanicals of the vehicles. They aren't trained and certified mechanics so they aren't able to do much when a vehicle comes in that requires mechanical attention. It would nice if we could offer that service in the shop to the customer. They have basic experience in the area of troubleshooting where the problem area is, but they aren't experienced in deeper diagnosis of the mechanical issues of vehicles. If we had an employee that was certified in engine repair, we could perform the repair. So I'd like for them to have education in that area too.

4. If you could suggest something the individual employee could learn that would benefit them and your organization, what would it be?

(Please elaborate.)

If the employees would have ASE (Automotive Service Excellence) certification in the area of automobile mechanics it would help. But to take advantage of that knowledge, we would also need equipment and space to attend to that potential problem area. We would have to expand to be able to do that and we don't have the ability to do that because we're "landlocked" at this location. My attitude toward doing work in the area of mechanical repair is that if we can't do it properly, we shouldn't do it at all. They need to understand the complete mindset that we can't leave them work to their own standards. There has to be a system of "checks and balances" for the shop's standards.

5. After reviewing the list of courses required from the college, what are your thoughts?

(Please elaborate.)

They need to have common sense of what's required to work in the auto body repair and paint environment.

They need to have an understanding of how to perform the basic mathematical calculations for measuring.

They also need a basic understanding of science to understand chemical reactions in paints and solvents---to understand what is happening and why there are reactions. These are both important factors to be proficient in this job.

In the area of communications, a course in Interpersonal Communications would be the most beneficial. The employees out there in the shop are blue collar guys and they tend to speak what's on their mind, so I think that it would be helpful if they knew the importance of using a little tact in their communication.

I think that an understanding of computer technology would be good for them to be able to understand the functions of the systems on the vehicles. They also need to access the Internet to get information on the repairs needed to some vehicles.

Knowledge of first-aid would be good because you'd want someone to know how to help someone who experienced an accident in the shop.

A common sense course would definitely help---if that would be possible.

Interview #26

Interview Questions for Automobile Technician Supervisors

- 1. What presently does your workforce do well---as far as their work is concerned?**

(Please elaborate.)

They are all certified technicians and they specialize in the dealership's manufacturer's vehicles product line. They are also able to work on all kinds of vehicles. They can perform duties that range from general maintenance to certified warranty repairs. They are good at performing diagnostics on mechanical or electrical problems.

- 2. What do they *not* do well?**

(Please elaborate.)

They all have about the same strengths, but maybe something that they might not do as well at would be when they are working on vehicles that aren't part of the dealership's product line. General repairs aren't a problem, but if there would be a computer programming issue on the vehicle, they might not have access to the other manufacturer's software. Although, that's pretty common in most shops.

- 3. What do you wish your employees could do or know---that they presently *can't* do or *don't* know?**

(Please elaborate.)

Being able to diagnose problems in other manufacturer's vehicles in regards to software training---so if we were able to do that, we could do more with the vehicles in that respect. For more in-depth repairs on those vehicles, we aren't able to service them.

- 4. If you could suggest something the individual employee could learn that would benefit them and your organization, *what would it be*?**

(Please elaborate.)

Cross-train into other manufacturer's products. That would apply to every shop technician.

- 5. After reviewing the list of courses required from the colleges, *what are your thoughts*?**

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(Please elaborate.)

Communications in general is an excellent skill to have---no matter what part of the business you're in. It can be a benefit when you're dealing with customers or another business situation. Interpersonal communication would be applicable. I don't see where public speaking would be needed though.

Computers are definitely a necessity because the technician needs to get information about the vehicles from different manufacturers in order to properly perform the repairs. There are computers inside the cars, and a lot of times the technician has to hook up a laptop directly to the computer in the car to obtain information. So, the technician at least needs basic skills to be able to do that. Everybody here needs to know first aid---especially when you're dealing with machinery or working with operating parts.

I don't think that you really need college algebra or calculus because I don't see where it would really apply to the shop environment here. I don't see where any of the work that is done here would require college algebra. I do see where a basic math course or a math course that is geared toward the shop work would be helpful---if that's what the vocational-technical math course is.

I want to say that a course in core values and ethical decision-making would strongly apply to the shop technician's duties. When they are working on the customers' cars and performing the repairs, the customer is trusting the car when it's in their hands.

It wouldn't hurt to have a little chemistry because the technicians deal with solvents and cleaners so it would be good to have a general knowledge of what they do.

Interview #27

Interview Questions for Automobile Technician Supervisors

1. What presently does your workforce do well---as far as their work is concerned?

(Please elaborate.)

In general, the amount of work that they are required do on any given day, and the quality of it, and the low number of comebacks is a pretty good indication that they perform their jobs well.

To do the repair work here, we break the repair jobs down into three groups.

We have the major technicians who do the heavier engine work. Then, we have another group that does the intermediate work such as brake work, tune-up work, and water pump replacement---lighter work like that. By doing it this way, if we have a guy who is stuck doing heavier engine repair work, the other jobs that come in don't fall behind. Then, we have a group of guys who do nothing but oil changes. At some of the other shops, the technicians do everything.

2. What do they *not* do well?

(Please elaborate.)

A lot of them don't like to take the extra training classes---because they're offered after working hours. It requires them to go to class from 6 p.m. to 10 p.m. in order to keep up with current information in their field. They don't want to get involved enough with after-working hours classes.

3. What do you wish your employees could do or know---that they presently *can't* do or *don't* know?

(Please elaborate.)

What I'd like for them to do is to work themselves up to the point where they are all in the top-level mechanic category. Initially, I'd like to get rid of the intermediate category of technicians. Eventually they could learn enough to be top-level technicians. I'd like for them to be able to do whatever needs to be done---instead of limiting them to brake work, tune-ups, and water pump replacements. If that were to happen, the work could flow a little bit better. So, the overall answer to that would be to combine the intermediate group of technicians with the major group of technicians.

4. If you could suggest something the individual employee could learn that would benefit them and your organization, what would it be?

(Please elaborate.)

The intermediate-level technicians could increase their skills to the point of being readily available to do the major repair and the intermediate repair.

5. After reviewing the list of courses required from the colleges, what are your thoughts?

(Please elaborate.)

After they graduate from the technical school, most of them don't want to go back to school to take other classes. We want them to keep up on ASE certification requirements---so any coursework that would contribute to that would be good. Knowledge of mathematics would be important, but it depends upon if the shop has a service writer. Then, that person would do the paperwork, so the technician doesn't do any math or addition. It all depends on the individual shop. Math is a good skill to know, and to have knowledge of operating a calculator, but it won't be something of direct benefit to the automobile technician.

You have to have a certain "knack" to do this job. You have to have the smarts and the intuitiveness to look at the job and say, "This is the wrong, and this is what I need to do."

Computer knowledge is something you have to keep up with all of the time. That's where the evening classes help the technician.

At this shop, the mechanics do sometimes talk to the customer---which is good because they are the ones who worked on the car and are knowledgeable of the car. So, a communications course could help the technician when they would have to talk to the customer---and don't want to sound too forceful.

Interview #28

Interview Questions for Automobile Technician Supervisors

1. What presently does your workforce do well---as far as their work is concerned?

(Please elaborate.)

They are good at following the procedures required by the company. There is a certain flow that they comply with. There is a specified work flow. As soon as the car comes into the shop, the technicians have to do an inspection on the vehicle within 15 minutes. The company feels that if the customer hears about something that their vehicle needs early in their visit, there's a better chance that they will buy something. If the customer is already here for an hour while they were here for an oil change, they are probably not going to want to wait another two hours for a brake job. The company requires that the technicians follow the process. On our paperwork, we have to record the time when we make the initial contact with the customer, then we record the time when we start checking the vehicle out---like if we check the alignment. Everything has to be recorded on the paperwork. We get audited on the paperwork to make sure that we did things like check out the condition of the brakes so that there's proof that we didn't pass up an opportunity to sell the customer a brake job. This inspection process is pretty much of a new thing. The technicians didn't like it at first, because if a car came in for a simple tire rotation, we still have to take micrometer measurements of the brake rotors to see if there is a problem in that area. But, it helps our sales because we're selling because we're taking the time to do a full inspection rather than just pulling the car in, doing the tire rotation, and sending the customer on his way. We're doing a full inspection and letting the customer know of any problems with their vehicle. The technicians don't like it that much, but in the end, they have more money that goes into their pocket because they get paid a commission---so they then make more money. They have to do a lot more work though. You figure that about one out of ten cars will result in additional work and sales.

2. What do they *not* do well?

(Please elaborate.)

There is varied staff out there. There are only three guys out there who have been here longer than a year. Everybody else has only been here for about three

months. There's a guy out there who has only been here for two weeks. This store has had a lot of activity within the past month. So, I'm dealing with a lot of new guys who aren't "up to speed" yet---like what the tire technicians should be doing. They should be able to change out four tires within an hour. We're taking an hour and a half to two hours. So, they are not working up to the time standards where they should be. That particularly applies to the newer equipment that we have here in the business. There's some really good machinery out in the shop area and they don't know how to use it properly to their advantage. I'm constantly having to tell them about little things that could be to their advantage. There are some procedures that are important they should be following, and don't---like applying the proper amount of torque when they are tightening something. I have to stay on them to make sure they follow the correct procedures.

3. What do you wish your employees could do or know---that they presently *can't* do or *don't* know?

(Please elaborate.)

I wish that they could go to the manufacturer of some of these machines so they could get better trained on them and get faster at them---especially these new guys here. Right now, they are getting trained by the other guys working here, and some of those guys have bad habits---so they're going to pick up those bad habits too. If they were able to go to the training center, it would probably only take a day, and then they would learn exactly what they should be doing. A lot of the newer vehicles require precision, and they could get the training that would apply to them. So, some additional hands-on training from the proper source would help them know what they need to know in order to do their job better. I've seen a mechanic take the ASE test and pass it---and still not know what they're doing. That doesn't necessarily mean that they could do the troubleshooting that they're supposed to be able to do---because they haven't had the hand-on training they need to do the job out in the shop.

4. If you could suggest something the individual employee could learn that would benefit them and your organization, *what would it be?*

(Please elaborate.)

Get the technicians to go to the manufacturer to be familiar with the equipment and be able to operate it better. I have training next month for two days that the manufacturer of some of the machinery here is sponsoring. It's going to focus on the equipment they make that we have here in the shop. I'm the service manager,

so I'm the overseer, but I'm not the one who is doing the repairs on a regular basis. There should be a class like that for the technicians. They should be able to go there for a day to see the equipment and work with the equipment so they're familiar with it. This could help them get faster at their job. The training could make them better, and faster.

5. After reviewing the list of courses required from the colleges, what are your thoughts?

(Please elaborate.)

I can see where English courses would be important because they have to be able to read the inspection sheets and write out what they find wrong with the vehicle--and I have to be able to read it. But, I know that I doubted the need for them when I was 18 years old and going to college. Now I understand the importance of courses like this. I know a mechanic who is now going to school to be a nurse because he didn't like turning a wrench. If they take these academic classes, and they either can't, or don't want to turn a wrench anymore, they have these courses as a background they can use for another program degree---so that time won't be wasted. I know that a lot of these guys think that they shouldn't have to take those courses and pay for them.

I also like the speech classes. It might be a hard sale for me to explain to a customer what's wrong with their vehicle since I'm the service manager in the office. I have a couple of good mechanics out there who can explain the service they do to a vehicle. Then, I have a couple who can fix almost anything, but they can't explain a darn thing that they're doing. So, if I have those guys (the ones who can't explain what they're doing) on duty, and I have a customer that requires a serious repair to their vehicle, I can explain the repair to the customer in my own terms---but they're not going to believe me as much as they're going to believe the mechanic who is doing the repair on their vehicle. I'd like for them to be able to talk to the customer and tell them, "Hey, this is what's going on with your car."

I noticed the area of mathematics on the list, and I feel that is an area that is very important. These guys have to use the micrometer on brake rotors and they need to know how to add and subtract. Also, on alignments, they need to use the computers that provide them with figures.

Computers are becoming more and more important every day on vehicles. They add computers to vehicles. Our alignment rack operates with a computer. Our emissions machine is done with a computer now. The wheel balancer is computerized. The technicians need to know at least basic math and be able to understand decimals for most of the machinery out there.

A first-aid course could help in case one of these guys get hurt.

The area of physics and science leads into being able to do things on alignments. They have to make sure that the angles are correct. The suspension is all about the geometry of the vehicle, so that course could help. The newer alignment machines basically tell you everything to do, but they still need to know in their

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head that if they were given a piece of paper with alignment information on it, they should know what to do.

Basic bookkeeping is important because of all of the stuff we have to do now that involves bookkeeping. The technicians play a part of every ticket that gets written up. They are responsible for making sure that they do a full vehicle inspection. They have to go back through their work and make sure that they sign off on every job they did. So the combination of bookkeeping and organization is very important because they have to keep the paperwork with them at all times. They have to look over the paperwork to see what they have to do on the vehicle, and report what they did.

I don't know how a history course could help the technician work on vehicles. It might help them understand about the past---like when an older vehicle comes in that doesn't have a computer. They have to understand how vehicles used to be put together.

Interview #29

Interview Questions for Automobile Technician Supervisors

1. What presently does your workforce do well---as far as their work is concerned?

(Please elaborate.)

The paintwork is done very well here. Everybody here has different skill levels. Some are better at some things than others. If you have a guy who is better at suspension work, he gets the suspension repair jobs. We also have a couple of guys who are better at straightening body panels, so they get those repair jobs. They are also good at frame straightening.

2. What do they *not* do well?

(Please elaborate.)

They do not read the estimates thoroughly. They don't spend enough time reviewing the repair order to note the parts that are required for the repair job. If a car is supposed to be out on a Friday, they may come to me on a Thursday and tell me that they also need another part to complete the job. They don't plan. Organization is the key to all of this---and most of these guys aren't organized. In some situations, they lack detail.

3. What do you wish your employees could do or know---that they presently *can't* do or *don't* know?

(Please elaborate.)

Be more organized and more thorough. That applies to some situations where the customer has to come back. An example would be where their air-conditioner isn't working when it left our shop. It is usually a situation where someone overlooked something---like they didn't tighten a fitting. Probably one of the biggest reasons this occurs is because the auto body repair technicians work on a "flat rate" basis. For example, if a job is supposed to take ten hours to complete, and the technician completes it in five hours, they still get paid for ten hours of work. Sometimes it is also referred to as piecework. So, when the technician wants to make more money, they work faster. If you'd be paid at an hourly wage, you could take your time to do the job, but here, we're involved with insurance companies----and the insurance companies want them in, and want them out.

4. If you could suggest something the individual employee could learn that would benefit them and your organization, *what would it be?*

(Please elaborate.)

Elevate their computer skills to a higher degree.

We have a computer program called "ALLDATA." Some of the technicians have a problem getting into the program, or finding things in the program. Most of the people here are older---who didn't grow up with the computer. So it can be a difficult job when the computer program is required. The measuring system for much of the repair depends on computer skills being used.

5. After reviewing the list of courses required from the colleges, *what are your thoughts?*

(Please elaborate.)

The areas of English and communications are very good to know. The technicians often have to communicate with people---in this case, the customers. They need to be able to get their point across.

The area of math is definitely something they need because on a car you're working with angles. You use geometry in the area of front-end alignments. Going back to dealing with customers, I can see where the "Social Behavior" class is good.

I disagree with a history course being a requirement.

Career management, human relations, occupational leadership; I can see where these courses could help the technician.

The importance of computer knowledge in cars is not going away; in fact, it's going to play a bigger role as time goes on. The cars are getting more complicated. There are scanners that you have to plug into cars. You have to be able to read them and understand them. There are scanners that connect to the air bag systems. There are also scanners for emissions that display a code. When it does that, you have to go to a computer and look that code up in the computer. You have to know your way around the computer and how to find things on it. Years ago, you didn't have to have as much computer knowledge, but now, the cars are getting much more sophisticated and complicated. You have to have training and education in the area of computers. The average person won't be able to fix even simple problems on their own cars due to the increasing level of technology on them.

Interview #30

Interview Questions for Automobile Technician Supervisors

1. What presently does your workforce do well---as far as their work is concerned?

(Please elaborate.)

Their quality of workmanship is very good.

They are good at time management.

They work well as a team.

Another thing that is important is that the group of guys that I have out in the shop will do whatever it takes to get the job done. The end result they believe in is to take care of the customer. They go above and beyond their duties. If they are fixing an area on a car where there is damage on one panel, and there is a prior ding in the area, they will go ahead and fix it because they want the end result to be nice because that is a reflection on their work. Maybe a lot of auto body technicians wouldn't do that, because they would want to charge for it. They are very concerned about what the result is.

2. What do they not do well?

(Please elaborate.)

That would be their communication skills.

There might be days when we're all busy, and communication from out there to in here, or from one of them to the next person, or from department to department doesn't happen smoothly. There are gaps sometimes. That would be my biggest frustration with them.

3. What do you wish your employees could do or know---that they presently can't do or don't know?

(Please elaborate.)

There is a line of work in this business called "paintless dent repair." Currently, we don't have anyone here who does that. I think that it would be nice to have somebody "in-house" because right now we have an outside vendor who comes in and does that. There's equipment issues involved with that too. We don't have the equipment to be able to do things like that---that we would want to do.

4. If you could suggest something the individual employee could learn that would benefit them and your organization, what would it be?

(Please elaborate.)

A lot of the things that would benefit them and the shop fall into the category of what is now required. They have to go to training every year. There are online courses that we have to do every year in order to maintain certification in various areas of auto body repair. It is an industry requirement.

Another thing would be to learn paintless dent repair and be familiar with the technology required in that field.

5. After reviewing the list of courses required from the colleges, what are your thoughts?

(Please elaborate.)

The areas of history would be irrelevant. I don't see where we would need anything from them that a history course would contribute to.

There are actually a lot of divisions in our field. Accounting and bookkeeping are areas that I don't think the technician needs knowledge of.

Salesmanship could be a good applicable course because anyone working out there in the shop has the potential ability to talk to the customer.

The study of chemicals and safety equipment would benefit them in this line of work.

Human relations---I can see where that could apply to them communicating.

As far as the area of composition, and the English, they really don't have to write much. They write up supplements. They take a car apart and they tell me what is needed on it, and that's pretty much the extent of having to write anything up. I don't even care if they don't spell the words right. The customer doesn't see what they write up. Basically, that's what our job is up here. We are the "go-between" between the customer and the shop. We do all the paperwork. The accounting and the communication all gets done up here. Here in the office area, we are the buffer. It's part of customer service.

As far as computers go, there are shops in this business where you need to access industry procedures. So computer knowledge could help in that area. The technician should have the general ability to be able to get around on the computer.

First-aid knowledge is definitely something good to have.

Math is useful. I don't know about calculus, but I think that a general mathematics course would be helpful. I don't think that physics is necessary.

In general, I think that courses from all of these areas would be beneficial---except that I can't really see where a history course could help them in any way.

(Note: I had an interview with people from a technical college. They asked us about their program because we've hired people who came from that college. They asked if what they were teaching was beneficial to what we do. I told them

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that a lot of it wasn't---because we had some of their graduates come in who quit because this was not what they thought it was. The college personnel assumed differently. I told them that it was due to the way the college taught the material. They came here, with a perception of what they thought they were getting themselves into---and the actual shop environment turned out to be very different. That gets into the occupational area---the hands-on kind of stuff.)

Interview #31

Interview Questions for Automobile Technician Supervisors

1. What presently does your workforce do well---as far as their work is concerned?

(Please elaborate.)

They are usually pretty good at the diagnosis and repair of the vehicles that come in here. Some of the vehicles require some in-depth diagnosis, and some don't. Thirty years ago, you spent 10% to 15% doing the diagnosing, and the rest of the time doing the repairing. In today's automotive technical environment, those percentages have flip-flopped. I suppose that if they're good at the diagnosing, you could say that they're good at critical thinking. Since they have to do it every day, they are honing their critical thinking skills---coming to conclusions. You could also say that they're very task-oriented.

I think that they have a high level to adapt because of the constant change in the industry. What you learned three years ago, won't fix today's cars. It's an ongoing challenge.

2. What do they *not* do well?

(Please elaborate.)

Sometimes, it's the simple problem of them not following instructions and communicating.

Another area would be that they are not as electrical-minded as they need to be. This is because vehicles today have more and more electrical components. They need to realize that they need to be completely knowledgeable of the industry as it is changing. It's a very difficult thing, but that's what the certification programs and training is intended to provide.

Maybe another area that they lack in is people skills---and communicating. Although it's not a direct requirement of the job, it is a benefit.

3. What do you wish your employees could do or know---that they presently *can't* do or *don't* know?

(Please elaborate.)

Well, everyone has their individual areas of weakness. One of the guys out there is lacking in the area of computer skills. He made choices 20 years ago that are

catching up with him. He didn't pursue the schooling then that he should have. He didn't get the training in that area he needed. He isn't knowledgeable enough of the electronics in automobiles.

They don't know enough about how the overall business is run---what it takes to make a profit. It's good for them to understand this if you expect them to work as a team. So, they need to be more knowledgeable of the importance of teamwork because that can contribute to the overall operating efficiency of the business. Sometimes the parts of operating this business can change on a month-to-month basis. The insurance costs, the taxes, or the price of parts could go up.

4. If you could suggest something the individual employee could learn that would benefit them and your organization, what would it be?

(Please elaborate.)

The first thing that comes to mind would be people skills. Another thing would be to understand the things that cause a lack of efficiency. It would help if they understood how to, and the importance in removing roadblocks so that efficiency can be improved upon. If they realized the importance of effectiveness and efficiency in their jobs it would make this place run smoother and be more profitable.

5. After reviewing the list of courses required from the colleges, what are your thoughts?

(Please elaborate.)

The thing that stands out to me is Core Values and Ethics---they should all have that.

I think that there is a lot of use for a general understanding of psychology.

I don't see much use for history or political science.

A social behavior course could probably contribute to their people skills.

Economics---I can see some benefits since that can apply to the operation of the business.

I don't think that College Orientation would be necessary.

An understanding of business and management would be good.

A communications course would be helpful---so I can see where the Interpersonal Communications course is meant to apply, as well as Oral Communications.

English Composition---I don't see where that is needed. The main thing that is required on the job here is to be able to read.

As I mentioned, computer-related courses are good and useful. I have an older technician here who struggled with that area.

A health and first-aid course could be good to have because the technicians work in an environment that could be dangerous at times.

I think that a basic mathematics course is sufficient for a technician to have.

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I can see where a basic physics course would be useful as it applies to vehicle electrical and vacuum systems. In general, I think that it could help them understand how a system works---so they can understand where their starting point is. Maybe the Technical Science course includes some of those things.

Interview #32

Interview Questions for Automobile Technician Supervisors

1. What presently does your workforce do well---as far as their work is concerned?

(Please elaborate.)

Well, they're all different individuals. Each individual has their personal strength in regard to what they do best. We have one who is very good at working on exhaust systems which often requires welding. We have another one who might be better at doing the diagnostics on vehicles. Then, I have one who does better than the others at working on brakes. Each one has their particular strength that they are best suited for. That's what you try to do as a manager---to get people who have at least one area of strength. Each one has to overlap into another area in order to learn additional skills. They have to learn the other skills that another one has. They are all cooperating at learning all the skills needed in the shop. Having a good attitude toward willing to learn is important and what I would say that they all have.

2. What do they *not* do well?

(Please elaborate.)

They are not the cleanest guys. I try to impress upon them that the appearance of the building and their personal appearance makes a difference on how the customer perceives the business. The customer who brings in a \$40,000 or \$50,000 car may sometimes walk out to the shop area to ask the technician a question. The customer may get the impression that unprofessional work is being done by a technician who is unprofessional looking. But, the technicians feel that it's not their job to communicate with the customer, so that would be something that they don't do well.

Another problem that I have here is that some of them either don't allocate the money to invest in tools, or they don't have the desire to invest in tools.

3. What do you wish your employees could do or know---that they presently *can't* do or *don't* know?

(Please elaborate.)

In general, most customers don't know exactly what their car needs or when to do certain things to it. So, the most important thing that I would like for them to do

is to educate the customer about those things. I would like for the technicians to be more concerned about the customer's "vehicle welfare."

4. If you could suggest something the individual employee could learn that would benefit them and your organization, what would it be?

(Please elaborate.)

Every technician should be cross-trained.

Every technician should also be customer-oriented.

5. After reviewing the list of courses required from the colleges, what are your thoughts?

(Please elaborate.)

They need to understand mathematics in order to do a proper diagnosis of the vehicles. They also need to be comfortable understanding math when they use a micrometer on brake rotors. Sometimes, they also deal with pounds and ounces when they service cars. Another item that comes into the work environment is with ohms and resistance---which ties in with math.

They also have to be computer-oriented in order to get information about a vehicle. The company also requires them to take tests that are online. They also like to promote technicians in this company, so as a technician would move up to a management position, there are different skills that are needed that various courses could help them with. Potential managers could benefit from taking courses in the area of communications because they will most certainly have to talk to the customers.

In this company, and other companies like this, those business courses on the list won't help them too much because the companies offer their own different classes throughout the year. A lot of the courses focus on areas like customer satisfaction, customer appreciation, and educating the customer about the things that are associated with their vehicle---like the benefits we can provide them by improving the vehicle's safety and ride with our service. Communications courses can play a big role in this area.

In the area of business courses, the technicians should realize the importance of maintaining inventory that is needed for servicing vehicles. If you have the items in stock, it can save you time---and that makes the shop run more efficiently.

There should be a course that focuses on the importance of inventory management. The efficiency of the technician can contribute to the gross profit of the business.

An important course area for potential managers in this business is human resources management. It costs money to hire a technician. It costs money to do any kind of training with them. Employee retention can save the company money which contributes to the bottom line. Employee turnover is a big expense.

Interview #33

Interview Questions for Automobile Technician Supervisors

1. What presently does your workforce do well---as far as their work is concerned?

(Please elaborate.)

We focus on transmissions, both automatic and manual. They are very good at working on either type. They can also work on differentials and transfer cases for four-wheel drive vehicles. One of the builders that I have here has been doing that type of work for a long time---and he is amazing. There are a lot of parts in a transmission, and he could identify any type of part and tell you what transmission it goes in. We also have specialists who do the R&R (remove and replace) work. They can go to a vehicle that they've never worked on before, and have the transmission out within an hour. They are both efficient and effective. You don't really have to tell them what to do. They work efficiently by themselves. They have a great work ethic. This place pretty much runs itself. A lot of times we test-drive a car, pull it in and scan it and be able to determine if the transmission will have to come out of a vehicle or if it can be fixed, or if it's something we can do inside the vehicle. If at all possible, the technicians try to fix the problem with the transmission still in the car so they can save the customer money. So, you could say that they're good at diagnosing the problem by test-driving the vehicle or by diagnosing the problem with a scan tool. They have a laptop that they can hook into the car which enables them to diagnose the problem that way, and reprogram the car's computer to fix the problem. They have good electronic and computer skills.

2. What do they *not* do well?

(Please elaborate.)

General repair work.

We don't really do some of the general repair to vehicles---like air-conditioning work and alignment. We don't have the proper equipment to be good at those areas.

3. What do you wish your employees could do or know---that they presently *can't* do or *don't* know?

(Please elaborate.)

Air-conditioning work, alignment work, and tire work---but a lot of that has to do with the fact that we don't have a lot of that type of equipment or stock parts for that type of repair.

One of them needs to be more experienced at rebuilding import vehicle transmissions.

4. If you could suggest something the individual employee could learn that would benefit them and your organization, what would it be?

(Please elaborate.)

More experience---because the more you know, the more you can do---and the easier your life becomes. A lot of the stuff, you learn by trial and error. Training can only give you a limited amount of overall knowledge.

ASE (Automotive Service Excellence) classes are a plus, or any additional kind of training you can get into can be of benefit. Even if it's something you're not going to use at the present time. It's better to know it and not have to use it than have to do something, and not know how to do it.

5. After reviewing the list of courses required from the colleges, what are your thoughts?

(Please elaborate.)

It helps to have business-related courses if you have any desire to ever become more than a technician. They can especially be useful for the possibility of running your own shop, and you really should want to know more about how things work with the aspects of business. Business knowledge can help you, depending upon the shop you go to. When I was working as a technician in a different repair shop, I ran the front area too. I talked to the customers too. That's how I started getting out of the technician role. Now, I'd rather be in the front area of the business talking to the customers. I feel that the more business classes a technician has, the better they are off. It's something that can help them manage their time too---by knowing how to multitask and get things done, you'll be able to be good in this business.

A common sense course would be helpful, but I don't think they teach that in colleges. Common sense can get you a long way in this business. I guess that courses that require critical thinking could contribute to that though.

English and communications are important areas for a lot of technicians. If you can't spell correctly or write correctly, you can't fill out a work order properly. Therefore, there's a communication problem with the person who is going to be writing the ticket up for the customer. At the interview process with a technician, some applicants would want to take the application with them so someone else could fill it out for them. I wouldn't let them do that because they have to know how to fill out a repair ticket because most of them are hand written. If I can't read or understand what a technician wrote down, I have to get up and go ask

them to explain it. So, communication is very important in this business. I personally didn't like it when I took it, but think that it's important for the technicians to have to take courses in this area. I can see where an oral communications course could help a technician where they would need to be able to explain a repair job to a customer. It involves taking something that's very technical, and how it works, and putting it into laymen's terms for a normal person to understand. Not to say anything derogatory about women, but men are usually a little more mechanically-inclined. They understand things like how a power steering pump works. It creates pressure, which can sometimes cause leaks. A woman might think along the lines of the power steering pump just naturally springs a leak on her car because it was making noise. They might not understand exactly what occurred that caused the leak. I feel that you should be able to explain to a customer what is wrong with their car if you have to work on it to fix a problem that you have to charge them for---so that they understand what is getting done. The last thing that I think should be in the mind of a customer is not knowing what was done to their car, or remorse for bringing it in here to have it fixed. I think that a customer wants to be informed and educated. Being a technician is hard---it's hard on your body, so if a technician thinks they ever might want to be in management, they will need good communication skills. My technicians often have to interact with customers. Sometimes, we have to ride with the customer in their car to determine what the problem is. It wouldn't help the situation if I rode with them because I'm not the one who will be doing the diagnosing that will eventually lead to knowing what and where the problem is. If the technician is good at communication, he can find out what the problem is with the customer, and also be able to explain it to me so I know about the repair parts and time involved.

In some cases, auto repair shops get a bad reputation because customers think that they're getting "ripped off"---and there are some shop that operate that way. It's important to have a reputation of being a good, honest shop. I believe that in order to have good customer relations, you have to instill a sense of trust and good ethics. At the previous business where I worked, the customers would ask for me--because I treated them in an ethical fashion. After I left, and they got "jerked around" with some of the people who replaced me, and they quit patronizing that business. They wanted someone they could trust.

Although most of the guys out there are pretty good at computers, sometimes they have to come to me. The more familiar a technician is with computers, the better they're going to be. Computers are not going to go away---you're going to need to always know more about them. If you're not interested in them, this is probably the wrong field for you to be in. The days of being able to fix a car with a wrench, socket, ratchet, and screwdriver are over.

I think that a basic math course is all that you need to be a good technician. Calculators, computers, and scanning tools can do most of the math for the technician. Although, there are a lot of ranges and numbers that a technician needs to be familiar with. It would help to have a photographic memory to be in this field. If you take a transmission out, and take it apart, you need to be able to

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remember where all the parts, nuts, and bolts belong, in order to fix it correctly. Then again, common sense can help out a lot there.

I can see where physics would be helpful because if you put a vehicle up on jacks, and take the transmission out, the balance of it is going to shift. This can be a dangerous job, and the car could fall on you if you don't understand some of the concepts of physics. I know of people who have gotten injured when working on vehicles when an unexpected accident (like it falling on them) occurred.

At the shop where I used to work, I was required to take first-aid training and know CPR. I feel that it's good to have that knowledge in the shop environment. If you have a "go-getter" attitude, you'll do well in this business.

Interview #34

Interview Questions for Automobile Technician Supervisors

1. What presently does your workforce do well---as far as their work is concerned?

(Please elaborate.)

They are able to work on all makes and models of vehicles. Their particular strengths would be in the area of working on the front-end suspension and steering components of vehicles that come in. They work good together as a team. That's one of the benefits of being able to keep employees working for you rather than dealing with turnover.

2. What do they *not* do well?

(Please elaborate.)

They don't keep the shop area clean. Cleanliness is one of their weak points. When a technician is busy, it's sometimes hard to keep up with that responsibility.

3. What do you wish your employees could do or know---that they presently *can't* do or *don't* know?

(Please elaborate.)

They should take additional schooling that covers new things happening on vehicles. They could take more classes in order to keep current with vehicle specifications and repairs that the industry demands.

4. If you could suggest something the individual employee could learn that would benefit them and your organization, *what would it be?*

(Please elaborate.)

I'd like for them to be able to communicate better with the customers. To learn how to really talk to a customer would be an asset. An important reason for this is because the customer is more willing to believe the technicians out there in shop rather than the front desk person. Whenever possible, I try to take the customer out there to the shop and show them the problem. It would be helpful to have the technician communicate with them directly about the problem.

5. After reviewing the list of courses required from the colleges, what are your thoughts?

(Please elaborate.)

Business courses are super-important. The technicians need to know what it costs to run this business. Also, the technician should be thinking about if they really want to be doing the manual labor on the cars for the rest of their life. They should give themselves chances to move up in a company. These business courses can help in that area. I realize though, that the technician is thinking about the time and money they are investing in courses that don't directly apply to them working on cars. I don't think that car dealers want the technician to talk to the customer. They just want the car in, and out as quickly as possible. Independent shops are different, and I think that is why a lot of people feel more comfortable dealing with them. In respect to the ability to talk to a customer, that's where I see how the Interpersonal Communications course could help a technician out.

The Personal Finance course could help the technician understand things like expenses on a personal basis, and then be able to relate that to how the business functions---but on a larger and different scale.

A psychology course would help technicians understand customers when they have to deal with them---especially problem customers. An example of this is that I have a guy who comes in here who is bipolar. He is the son of a business customer---which is a large account.

Interview #35

Interview Questions for Automobile Technician Supervisors

1. What presently does your workforce do well---as far as their work is concerned?

(Please elaborate.)

They fix cars very well.

They do a great job of providing a lot of the equipment that we use here at the business. Some of their own equipment that they bring in would be their advanced diagnostic equipment, and almost of the handheld tools they use in doing repair work. That's pretty common in this industry though.

They work extremely well as a team. I'm really proud of them for that attribute especially because of how technicians are paid. If they spend time to help other technicians, that might prevent them from getting the job done quicker than the one they're working on.

They look cars over very carefully---keeping our customers' safety in mind.

They are loyal and faithful employees. In looking at the technicians out there, everybody has been here at least seven years.

I have two really strong diagnosticians.

I have an older technician who has been in the business for a long time. He's an extremely efficient worker and is very knowledgeable of the older vehicles that come in here to be serviced.

2. What do they *not* do well?

(Please elaborate.)

Attention to detail is lacking. That would be in regard to their write-ups on the automobile repair orders.

3. What do you wish your employees could do or know---that they presently *can't* do or *don't* know?

(Please elaborate.)

They could all be more detail-oriented.

I wish they could compose, and write better. If they could envision themselves in my position, and realize what I need to know to feel confident enough to speak to

my customer, they might better understand the importance of being more thorough and complete with what they write on the repair orders.

They could be better at the advanced diagnosis that is required on later model European cars. The European cars are harder to diagnose. In some aspects, they are very unique. We are willing to pay for any training that they want to go to. (Note: In Europe, technicians are respected as much as medical professionals) It would help if the older employee would be more familiar with Internet related tools and repairs.

4. If you could suggest something the individual employee could learn that would benefit them and your organization, *what would it be?*

(Please elaborate.)

For two of my technicians, a typing class would help them be more proficient on the computer.

For two other technicians, some type of a writing course would be helpful.

Due to some of the immigrant customers we have, it would be great if even one of the technicians would take a Spanish class. Another language proficiency that would benefit our business would be Bosnian.

5. After reviewing the list of courses required from the colleges, *what are your thoughts?*

(Please elaborate.)

I don't understand why a technician should have to take any type of history or political science course.

I can absolutely see where a psychology course in the behavioral science area would be helpful because it can help them communicate with the customers.

Core values and ethical decision-making is very important in this business.

Anything that relates to ASE (Automotive Service Excellence) is definitely important because all of our technicians are ASE certified.

If my technicians were wanting to go into business for themselves, or if I wanted them to be part of the front-end operations, I would consider some of these business courses to be important. I think that a lot of people who go into an automotive technology program might be thinking about eventually owning their own shop. In that case, all of these business courses would be very important. If they were only going to work for some business, then courses in this area wouldn't be that important. If the situation would be where the student is going to have to spend a lot of money taking these types of courses, and doesn't really need them, then I don't think that he should have to take them---unless he was going into business for himself or with a partner.

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I think that a technician should be able to spell and write a sentence, and translate their thoughts into a sentence. They should at least take College Composition I, or some form of first-year English, and Career Communications.

The “Writing for Industry” course sounds like it applies to people working in the technical field and could be beneficial.

I don’t feel that someone who gets out of a technical college with a certificate, instead of an associate degree, isn’t ready to start working on cars. I had a couple of technicians who were previously employed here who exemplified that.

The “Computer Applications for Technicians,” or “Computer Literacy” courses sound like they would be awesome and applicable courses for automobile technicians. For the purpose of taking courses online, the “Introduction to Online Learning” course would be good.

In this business, I think that the area of first-aid and lifesaving is very important---as well as the area of lifetime wellness is too.

An applied math or technical math course is needed for technicians. My people out there are probably using math more than I’m aware of. I don’t think that calculus or trigonometry is necessary. Business Math wouldn’t be either unless you were going to be an owner or a partner in this type of business.

I can see where physical science knowledge would come in handy because of the need to see the relationship between something like the outside temperature and the inside temperature when you need to do a proper diagnosis of an air-conditioning system. Air-conditioning may be harder to diagnose in the winter time versus the summer time.

An environmental technology course is a good offering, since we’re emissions inspectors, so I can see where that would apply.

Appendix B

Appendix B

Interview Responses for Each Interview Question

(Note: Possible identifying information has been replaced with XXXX.)

Interview Question Number One

What presently does your workforce do well---as far as their work is concerned?

- 1.** Fix it right the first time. It's something that the car manufacturer grades us on. Our 12-month score is 85%. The top 10 dealers in the nation are at 90%. So, were five percentage points below the top 10 dealers in the nation. It's a pretty good score. The reason why we don't get a better score is because if we have to order a part, and the customer has to bring it back, they don't consider that it was fixed right...---and we take a hit on that. Or, if a customer has a concern that only happens sometimes, if they come in, and the car is not doing it, or we can't verify it, we take a hit on that. Or, sometimes the customer has a concern that is characteristic of the vehicle, or it's a normal condition that they're not happy about---something that it does that they don't like.
- 2.** The actual repair of the vehicle, they do very well.
- 3.** They do a quality job. These guys are well-trained in the automobile manufacturer's product. They know what to look for as far as maintenance needs, repair needs, and what kind of problems the vehicle is coming in for. They have a good idea of what repairs are needed to get the car back out on the road again. My guys are on time, and they put in a good day's work. They also, if I need extra time out of them, a lot of guys volunteer to stay late and do other stuff that I need them to do. I have a very good core of guys out there that respond well. I don't get any guff out of them. I don't overtax them or ask too many things of them, so I think that it's fair on both ends.
- 4.** They effectively work together as a team.
What I mean by that is that is two or more techs putting their heads together for a diagnosis to talk about unusual concerns that we run into. We

brainstorm together to help improve processes on ways to strengthen customer satisfaction and loyalty. One of the things that I found out that works really well is if I let them study and train together, whereas if I put one guy in a room by himself he might complete only one task. But, if I put a couple of guys in there together, they can bounce ideas off of each other and they'll get through a whole lot more training and they'll come out looking like they absorbed some of it rather than looking like they were stunned.

At other shops where I worked, there's a lot of individualism, and then there's a lot of little cliques. But here, we have ten to thirteen guys that basically, where some guys are stronger. You're always going to have some guys that are stronger in some areas than others. Some guys are going to be good with electrical, some guys are going to be good with transmissions, some are going to be good with drivability. I think that most of my guys are master techs. That means that they are trained all the way across the board in everything. The reason this works well this way is because I can give them any job. I know of people that go to a smaller town to a small dealership and their transmission guy is on vacation---and nobody can touch their car for a week. So this way, I still think that the best thing that we do is working together. So, if someone gets stuck on something, they can turn to somebody else, or another guy. Everybody in the shop knows when you've got a troubled problem in the shop. Our program is continuously at or near 100%---and I believe that is why---because everybody does care about getting the car fixed, and they put aside whatever they've got going on to help each other. I think that's what makes us so successful.

5. They're good at teamwork.

They definitely help each other out in hard diagnosis with complicated problems. The advisors work well with the technicians in the area of communication in every aspect.

I think that the group that I have generally cares if it's fixed right or not. They don't try to shortcut. They don't try to rig something. It just doesn't happen.

6. In my workforce, there are a number of areas. There's service advisors, there's technicians, porters, but I assume that we're mainly focusing on technicians. They do a good job at repairing vehicles---fixing cars, and most of that is attributable to their training and their skillset. My particular group has been trained on everything. There's no specialization---other than by franchise---we do that. Some techs receive training on one manufacturer's vehicles, and other techs are trained on the other manufacturer's vehicles. But each technician is trained "all-around" to be able to work on an engine, a

transmission, the interior, air-conditioning---and so on. They're not just specialized. We don't have anyone who just does transmissions, or just heavy engine work.

7. They understand their job completely and they communicate well with customers. They interact well with other people. They repair the vehicle right the first time.

8. Ethics---they are my number one priority.

I can deal with a guy who may not be the best technician in the world which may result in comebacks to the dealership because they have not done well with the XXXX being documented properly, because I can train in these areas. That is pretty much a priority in this business. You have to document everything you do. We live in a litigious society. People want to sue because you worked on their car. People will try to take advantage of you if you're not good at documenting---not everybody, but there are a lot of people like that. So, ethics are truly my number one priority. I don't feel that this type of business can be a lucrative business if you don't have your ethics. My motto is ... So I would have to say that my workforce is very knowledgeable about their ethical practices.

9. I will answer that with a question. When I look at my work force, I have three components in the work force. I have technicians, I have service writers (or advisors)---people that you talk to most of the time, and then I have parts people. Those three hubs make up the primary workforce in the service department. So, if you're asking what do we do well, if you're talking about the technicians, I guess that we want to focus on that part of the equation. I think that what they do well, and what I really like about this organization, and what I want to interject at this point is that I'm fairly new here. ... I also went to Ranken Technical College, and I also went to University of Missouri-St. Louis, so there's a little bit of my background. But what I really think that they do well is to work together as a team. I think that they communicate well as a team, I think that they have good energy. I think that they do an overall good job of keeping consistent on their training, and the quality of workmanship that they provide. The specific thing that I might mention is that they use online methods to do more than get computer-based information. We use a computer-based multi-point inspection form. I think that they do a very good job at completing that. We use that tool to do two things with the customer:

- a) Educate them about the status of their vehicle in a very simplistic green, yellow, red, sort of notation. Green is good, yellow is cautionary, and red means that we have an issue.
- b) Then, their documentation of that with some quantitative information such as measurements or tread depths. In this area, they do a very good job.

10. We repair body parts, replace body parts, refinish body parts, assemble and disassemble cars. They have a particular strength in repairing things. It takes an art to repair things to the point of where they were before they were in the accident—from being bent up.

11. Hands-on stuff---as far as actually repairing the car and getting things done, and scheduling their time---for the most part---except for a few of them. They also do their job to the utmost of what they can do---as far as skill and ability. We do have guys at different pay scales, so you can expect different levels of efficiency from each guy---due to their pay scale and their skillset---what you would expect for their pay level. If you're paying a guy $\frac{3}{4}$ of what the general journeyman scale is, which is what the top guys are making, so, if you're paying a guy $\frac{3}{4}$ of that, you can only rightfully expect $\frac{3}{4}$ of that amount of work from him--and quality also.

12. They are always able to get along real well, and help each other out. They are pretty good about staying on task, and doing what they need to do. Their quality of work is generally pretty good. We're a little different here. I basically go through the work and quality control everything that goes through the shop to make sure that we don't have any issues that could arise.

13. I'm not sure what to tell you about that question. I'm upset with them most of the time. But, I guess that if I had to tell you something definite, I'd say that they follow the information that I put on the repair orders.

14. I hope that they do everything well. They are very good listeners. The common sense thing goes a long way when you're working in this business. You have to take what a customer is trying to tell you and roll it into what the problem is with the vehicle. I have several guys working here who are full master technicians who are very good. I also have light-duty technicians, and a lot of those guys are actually doing very well also. The majority of my work force is good at pretty much everything. They are good at listening to the customers, diagnosing the problem, and performing the needed repair on the vehicle.

- 15.** All areas---everybody in the workforce does their job well. They are all competent and experienced.
- 16.** The majority of the workforce is experienced enough to handle any of the work that comes into the shop. They can handle jobs that range from tune-ups all the way to engine rebuilding. They are experienced with all aspects of mechanical work. Their experience allows them to handle the entire gamut of work required.
- 17.** They are very detail-oriented---and that's because the tasks require it. They are also thorough in their evaluations of the repair needed for the vehicles. They understand that the work they do is important. So when the customer brings their car in, they realize that this business would not be in operation if we didn't have customers. By and large, most of them work exceedingly hard. That means that some of them are willing to work 14-hour days. If someone needs their car on Saturday night, and we normally close at 7:00, most of them would be willing to stay until 9:00. They are dedicated and devoted to the job they do. They're all committed to accepting the fact that they don't have all of the answers. If they don't know the answers, they ask for help. That, I think, is the largest part of their success. They are not so arrogant that they think that they know the answer to every repair problem.
- 18.** I kind of think that they do everything well. Otherwise, they wouldn't work here. Three of them are ASE certified. The fourth guy, the youngest one, he went to Ranken. He doesn't have his certification yet but he doesn't do as much as the other guys. The other three have been here quite awhile. ... But really, they're all three very well-trained. My youngest one---he's good. I just kind of keep him busy with services and brake jobs and front end work. He doesn't do much of the diagnostics, but what he's done up to this point, he's done fine. Some of them preceded me. They were keyed into this job before I came along, so they're all very good. They take care of what they do. We have no employee issues in here in the way that the business is run. It's nice. They complement each other. I believe that they could get a job any dealership if they chose to. That's actually a little easier in some ways because a dealership is geared to one type of car. The guys in the shop like ours have one of the tougher jobs there is---as far as being a technician. They work together pretty well. We stay away from some of the higher end cars. There are certain cars we don't work on like Audis or Jaguars. We might change oil on them. In fact, practically every car make out there has been

through our doors at one time or another. But some of them I try to steer away from. You can't do everything to all of them anymore. I would say that they are versatile because they all do a variety of things. They are willing to go to the computer to resolve problems that come up on cars.

- 19.** Some of them are very detailed. Obviously, I have some people who I have to work with to get more "dialed in" as far as detail goes. Most of the guys are very good about that because in this business, you have to be very thorough. Some of them are very thorough with paperwork, and with others, you have to keep working with those things. As far as their use of English, these reports don't have SpellCheck on them so it's interesting with the spelling and grammar that ends up on some of them that we have to go through and clean up. They're brilliant on cars. I wouldn't want anyone else working on them, but if the customer sees the way the ticket is written out, it wouldn't be good.

They're very knowledgeable about what they're working on. We hire a lot of people with a lot of experience. We pay a little bit more than most dealerships. All of our guys have a lot of experience, so as far as that goes, we're good. So, the pay scale and longevity---being at the same place and doing what they expect from each other is a plus. They support each other. They know each other very well, so they support each other in terms of their strengths and weaknesses. When there's a lot of turnover, you're always trying to figure what you've got, and who's working next to you, and what to expect from them. They communicate well. With most of our guys, I'd feel very comfortable with them coming up and talking with our customers. I'd have no problem with that. Some of them would be better face-to-face than writing their English, but that's something we have to clean up.

- 20.** Any kind of mechanical work---from computer diagnostics to rebuilt engines and rebuilt transmissions---you name it, we pretty much do it. We don't get into body work---other than bolt on a mirror or a headlight assembly or taillight assembly---stuff like that---door hinges, maybe. We pretty much all go to classes all of the time---several times a year, really. There's a lot of new technology out there, and we have to stay up with it. They stay up with current technology. I have certain guys who do certain things, but as far as the general jobs, we all do it all. I have one guy who does computer diagnostics, and another guy is better at doing ball joints and engines and the heavier work. The workforce complements each other's skills. We have access to online diagnostics for repair data---which you almost have to have. They use diagnostic data to their advantage. I have a diagnostic guy who

knows a lot about computers.

- 21.** They usually work well together---as far as helping each other out who have different skill levels. The older guys are willing to help the younger guys, and want to see them improve. In general, they complement each other's skill level.
- 22.** They do a broad range of auto repair such as brakes, exhaust, tires, alignment, tune-up, fuel system work, steering, suspension---practically every type of maintenance and repair that a vehicle needs. We specialize in brakes and exhaust systems---custom and factory. We also do catalytic converter replacements. We also do fluid changes. We're good at alignments because we have an alignment machine. We also do engine diagnostics. We don't do rebuilding, but other than that, we're a full-service shop, and I think that we do all of those things I mentioned pretty good.
- 23.** Well, I have technicians who would rank in the category of being elite, and also technicians who rank in the category of basic. But overall the trait that applies to them on an overall basis is that they try to be thorough by trying to get to the root of the problem rather than just analyzing the surface of the problem. In regards to the actual hands-on aspect of their work, I have two technicians who are very good at the automobile electrical systems. Then, I have two technicians who are good at the basic mechanical jobs. We are above average, in fact leaders in the area of diagnostics. We can do major as well as minor repairs. We have a job out there right now where we're pulling an engine out of a car. So, we can handle engines and transmissions that require major and minor repair. We can cover the areas of routine services, major mechanical repair, and we are heavy into diagnostics.
- 24.** Our shop is definitely known for the quality and satisfaction we put into our repair jobs. Our goal is to have zero "comebacks" or customer returns---and we're very close to achieving that. It's very rare that we have any issues. Most jobs that are of any size at all get detailed before the vehicle leaves the shop. We provide an extra little service like that to make sure that it's what it needs to be before it's delivered. My employees go above and beyond the normal job responsibilities of an auto collision repair shop. We strive to achieve the "wow factor" when a customer get their vehicle back. My employees have a strong belief in high quality standards in all aspects of auto body repair. They are highly trained. If there is something that they need to take or even want to take, I provide for it.

- 25.** Our shop has a lifetime transferrable warranty on the auto body work that we do so I would say that the main thing we do well is to be attentive to detail. All of our staff is ICAR (Inter-industry Conference on Auto-collision Repair) certified. Our employees are well-trained in the technology that is required in this industry. They are familiar with the qualities that high-strength steel has and also of the alloys. It's an evolving industry and our employees are dedicated to doing their best to evolve along with it. I would also add that they do their utmost to do each job perfectly.
- 26.** They are all certified technicians and they specialize in the dealership's manufacturer's vehicles product line. They are also able to work on all kinds of vehicles. They can perform duties that range from general maintenance to certified warranty repairs. They are good at performing diagnostics on mechanical or electrical problems.
- 27.** In general, the amount of work that they are required do on any given day, and the quality of it, and the low number of comebacks is a pretty good indication that they perform their jobs well.
To do the repair work here, we break the repair jobs down into three groups. We have the major technicians who do the heavier engine work. Then, we have another group that does the intermediate work such as brake work, tune-up work, and water pump replacement---lighter work like that. By doing it this way, if we have a guy who is stuck doing heavier engine repair work, the other jobs that come in don't fall behind. Then, we have a group of guys who do nothing but oil changes. At some of the other shops, the technicians do everything.
- 28.** They are good at following the procedures required by the company. There is a certain flow that they comply with. There is a specified work flow. As soon as the car comes into the shop, the technicians have to do an inspection on the vehicle within 15 minutes. The company feels that if the customer hears about something that their vehicle needs early in their visit, there's a better chance that they will buy something. If the customer is already here for an hour while they were here for an oil change, they are probably not going to want to wait another two hours for a brake job. The company requires that the technicians follow the process. On our paperwork, we have to record the time when we make the initial contact with the customer, then we record the time when we start checking the vehicle out---like if we check the alignment. Everything has to be recorded on the paperwork. We get audited on the

paperwork to make sure that we did things like check out the condition of the brakes so that there's proof that we didn't pass up an opportunity to sell the customer a brake job. This inspection process is pretty much of a new thing. The technicians didn't like it at first, because if a car came in for a simple tire rotation, we still have to take micrometer measurements of the brake rotors to see if there is a problem in that area. But, it helps our sales because we're selling because we're taking the time to do a full inspection rather than just pulling the car in, doing the tire rotation, and sending the customer on his way. We're doing a full inspection and letting the customer know of any problems with their vehicle. The technicians don't like it that much, but in the end, they have more money that goes into their pocket because they get paid a commission---so they then make more money. They have to do a lot more work though. You figure that about one out of ten cars will result in additional work and sales.

29. The paintwork is done very well here. Everybody here has different skill levels. Some are better at some things than others. If you have a guy who is better at suspension work, he gets the suspension repair jobs. We also have a couple of guys who are better at straightening body panels, so they get those repair jobs. They are also good at frame straightening.

30. Their quality of workmanship is very good.

They are good at time management.

They work well as a team.

Another thing that is important is that the group of guys that I have out in the shop will do whatever it takes to get the job done. The end result they believe in is to take care of the customer. They go above and beyond their duties. If they are fixing an area on a car where there is damage on one panel, and there is a prior ding in the area, they will go ahead and fix it because they want the end result to be nice because that is a reflection on their work. Maybe a lot of auto body technicians wouldn't do that, because they would want to charge for it. They are very concerned about what the result is.

31. They are usually pretty good at the diagnosis and repair of the vehicles that come in here. Some of the vehicles require some in-depth diagnosis, and some don't. Thirty years ago, you spent 10% to 15% doing the diagnosing, and the rest of the time doing the repairing. In today's automotive technical environment, those percentages have flip-flopped. I suppose that if they're good at the diagnosing, you could say that they're good at critical thinking. Since they have to do it every day, they are honing their critical thinking

skills---coming to conclusions. You could also say that they're very task-oriented.

I think that they have a high level to adapt because of the constant change in the industry. What you learned three years ago, won't fix today's cars. It's an ongoing challenge.

32. Well, they're all different individuals. Each individual has their personal strength in regard to what they do best. We have one who is very good at working on exhaust systems which often requires welding. We have another one who might be better at doing the diagnostics on vehicles. Then, I have one who does better than the others at working on brakes. Each one has their particular strength that they are best suited for. That's what you try to do as a manager---to get people who have at least one area of strength. Each one has to overlap into another area in order to learn additional skills. They have to learn the other skills that another one has. They are all cooperating at learning all the skills needed in the shop. Having a good attitude toward willing to learn is important and what I would say that they all have.

33. We focus on transmissions, both automatic and manual. They are very good at working on either type. They can also work on differentials and transfer cases for four-wheel drive vehicles. One of the builders that I have here has been doing that type of work for a long time---and he is amazing. There are a lot of parts in a transmission, and he could identify any type of part and tell you what transmission it goes in. We also have specialists who do the R&R (remove and replace) work. They can go to a vehicle that they've never worked on before, and have the transmission out within an hour. They are both efficient and effective.

You don't really have to tell them what to do. They work efficiently by themselves. They have a great work ethic. This place pretty much runs itself. A lot of times we test-drive a car, pull it in and scan it and be able to determine if the transmission will have to come out of a vehicle or if it can be fixed, or if it's something we can do inside the vehicle. If at all possible, the technicians try to fix the problem with the transmission still in the car so they can save the customer money. So, you could say that they're good at diagnosing the problem by test-driving the vehicle or by diagnosing the problem with a scan tool. They have a laptop that they can hook into the car which enables them to diagnose the problem that way, and reprogram the car's computer to fix the problem. They have good electronic and computer skills.

34. They are able to work on all makes and models of vehicles.

Their particular strengths would be in the area of working on the front-end suspension and steering components of vehicles that come in.

They work good together as a team. That's one of the benefits of being able to keep employees working for you rather than dealing with turnover.

35. They fix cars very well.

They do a great job of providing a lot of the equipment that we use here at the business. Some of their own equipment that they bring in would be their advanced diagnostic equipment, and almost of the handheld tools they use in doing repair work. That's pretty common in this industry though.

They work extremely well as a team. I'm really proud of them for that attribute especially because of how technicians are paid. If they spend time to help other technicians, that might prevent them from getting the job done quicker than the one they're working on.

They look cars over very carefully---keeping our customers' safety in mind.

They are loyal and faithful employees. In looking at the technicians out there, everybody has been here at least seven years.

I have two really strong diagnosticians.

I have an older technician who has been in the business for a long time. He's an extremely efficient worker and is very knowledgeable of the older vehicles that come in here to be serviced.

Interview Question Number Two

What do they *not* do well?

- 1.** Sometimes the technicians talk in language that the customers don't understand--if that makes sense. Sometimes they talk in technical terms or acronyms that people don't understand. I think that they'd do better if they talked in more laymen's terms. There are some of the guys that are pretty good at it, but most of them---it's like talking to a doctor.
Around here, they don't always tell us if they get a customer's car dirty. Then we don't know that until you're standing out front with the customer. But, if they would have let us know that, we could have gotten it cleaned up before they came to pick it up. It's inevitable that it's going to happen because the guys are always working in grease and oil and they're more worried about fixing the car and not small things like that.
- 2.** Communication---which is necessary to do the answer to job one. And in communication, they lack their skill in spelling and English.
- 3.** Well, sometimes, you feel like you have to be a "babysitter." They kind of "cherry-pick" the jobs where they try to avoid a particular job so another guy will get it. One guy might want a "gravy job" versus one that will "tax" them a little bit. Rather than taking the next job that's supposed to be theirs, they might try to find a way to get around it. They're supposed to go to the computer that displays the jobs, and take what it gives you. That's the only way to be fair to everybody.
- 4.** What I think is worthwhile pointing out in this area, is that the workforce is getting older. So, probably what we don't do well is to keep ourselves in shape. I've noticed a lot more physical fatigue, doctor's appointments, people straining this, and pulling that, so I would say that fitness is something that we could do a better job at.
Some of them don't test well. I can remember that one of the very first master technicians that I ever met, wasn't one of the best techs I've ever had working for me, but he was really good at taking tests. So, some of them don't test well, and some of that may be due to not picking up good study habits when they were in school. This is a generation of technicians that has probably seen the biggest amount of change in the last twenty years. When they started out, they didn't have to know how to type and they didn't have to know how to run a computer. It's a lot harder for them now. It's changing so much every day--to keep up. They don't have basic computer skills or keyboard ability.

There's a lot of times when I have to go around out in the shop trying to help guys with basic functions of computer programs---not so much as testing and diagnostic systems, but how to use the management system of the computer that they're on.

- 5.** Computer skills---as far as the basic computer pc's and stuff like that---Windows, Microsoft---they feel like that's for the younger generation. The younger generation, you'll find, will have more computer skills. They're the ones with the I-Phones and stuff like that and know how to work every application there is. The report-writing and documentation---documentation skills.
- 6.** Well, nothing singularly holds true for all of them, but the biggest issue related to their jobs is proper documentation of their work---especially for warranty work situations where we have to document, complaint, cause, and correction. We have to document what resources were used to lead us to the repair. We have to document the proof of what we fixed with some of the equipment we have... To sum things up, not following all of the steps would be something important that they do not do well.
- 7.** Sometimes we have little issues with time management. We actually have a great group of guys, but I'd have to say that the main issue is time management. Everyone is well organized, but time management would be the main thing that we have to work on.
- 8.** That is a two-fold question. I try to keep my employees here a long time. If you got fired, it's because you weren't ethical, or you got caught lying, cheating, or stealing---violating the basic principles of ethics. If we practice the motto of doing the job, and doing it right, we can work around any issue. But, let's take a technician who graduated from high school in 1980. Back in the 80's, guys couldn't usually go to college unless their parents were paying for it. There was no such thing as a student loan. There were personal loans, and you couldn't get a personal loan unless you had collateral. Most of the guys that are here, and have been here since the 1980's, don't have a degree, and barely have a high school education. They may be fairly good technicians, but they're not very good in the area of reading, writing, and spelling---which has become very important. Now, in 1985, one of these guys could overhaul a carburetor. He could overhaul what was called a computer command control carburetor. You had a computer, and you had a carburetor. The computer built the carburetor. That was the technology then---and that

was really tricky. But, I can't give a 1985 car to a kid who went to school in 2010. He doesn't even know what a carburetor is. I'd have that kid (who has all the current training under the sun) open the hood of that 1985 car. He would probably say, "What do you want me to do with this?" He would have no idea---so I have to have people with a variety of skills. One guy would be good at one thing, and another would be good at another thing. The older guys tend to be good with the older technology cars, as well as the new because you learn through fruition. In other words you learn what comes along, so it's not overwhelming. So in reference to what they don't do well, they might be phenomenal technicians, and be great with the wrenches, but they don't have good literacy skills. It's an issue---not everybody though. I'm not saying that applies to everybody. I'm not saying that they can't read or write, but if you ever read what some of these guys wrote, you'd understand what I'm talking about. We'll now get that kid who graduated in 2010, and he's all on the computer aspect of it, but he's not so well versed on the internal parts of the motor which gets back to the basics of what the technicians learned in 1980---such as the valves, pistons, and rings. They can do the work. All the technicians can do the mechanical work that comes into the shop area. I'm just saying that the strengths and weaknesses tend to apply to these areas. Some---I can't say everybody, but overall, that's what you see.

- 9.** I think that some of the things that we don't do well would be that I think that we could do a better job at confirming, which is where I sometimes see a breakdown. That's why I mentioned our parts department. Sometimes we have a challenge in getting the right part ordered. And where I've not fully diagnosed that shortfall involves the question concerning whether it's from the technicians who say, "I'm looking at this part, and this is what I need." Or, is it from the parts side, but either way, we, as a business model could do a better job at confirming, "I needed this particular switch, and I ordered the correct switch. Part of that could come from slowing the process down a little and really looking at the schematic in the parts department to see that it's the part that I surely need. It boils down to an accurate confirmation of parts ordered, because it is specific to that. It's actually a double-edged sword when I think of the thing that we don't do well is to kind of "stop the presses" in a timely fashion. What I mean by that is that sometimes I really appreciate our guys' desire to fix a car by "diving in" to get it fixed, but sometimes we have to stop and re-evaluate our diagnosis for two reasons:
- a) Are we going south, when we should be going north? In other words, could we be misdiagnosing the car, but more so on the side of keeping the customer in the loop.

b) The technician will get so engaged in trying to fix the car; he will forget that we've got to update the service writer, who then updates the customer as to the status of what's going on.

So, that's what I mean by the double-edged sword. They care wonderfully about fixing the car. You're here until 6:00 to fix the car, but the customer is out there looking at their watch wondering what is taking so long. That's not really a bad problem, but it is something that's a communication issue. The other thing we do that involves a communication issue is that we don't use the computers. I'm not talking about the multi-point form, I'm actually talking about industry-specific software that they don't fully utilize. We use a program called Reynolds & Reynolds or ERA. They should do a better job of putting their stories in the computer. That's a little bit of a different level of documentation. Not to be speaking out of both sides, but I think that they do a good job of checking, but I think that we need to do a little bit better of a job of telling our story in the typing. I think that part of that comes from typing skills, or the lack thereof.

10. They don't communicate with the office well at all---when the car is going to be done, what they're doing to the car, or what stage of the repair the vehicle is in. I have numerous meetings where I feel like I'm talking to myself.

11. A couple of them have slight communication problems insofar as relaying to me what they need, or what they need to get a car done. In reference to computer skills, I don't think that anyone in here has good computer skills from the schools they went to, and it does come into play here on the frame rack. I have to go out and help some of them with the equipment. I was in the shop just a year ago, so I've been on both ends of the situation. Also important is managing their time sometimes---as far as the process of repairing a vehicle. It's a step-by-step process. Multi-tasking would be another thing that some of them don't do well---working on more than one car at a time efficiently.

12. It varies from person to person. As a general group, they don't really push. We're not a flat-rate type of shop, so we're a little more lax than other places--industry-wise. So, productivity probably isn't where it should be. There is a lack of knowledge in some cases in the areas of computers and electronics. My guys do a lot of wiring stuff, so a couple of them could be better at it.

13. The main thing that I would have to say about that question is that they lack a decent work ethic. One time I was really busy with customers at lunch time

and I asked one of them to get something for me, and he said, “I still have three minutes left on my lunch break.”

Another problem I have with them is that they don't keep an eye open for extra services or parts that a customer's vehicle might need. They should be doing that when they are working on the vehicle. Even if the customer brought the vehicle in to get something else fixed, they should inspect the vehicle to see if there is something else that needs attending to. It's something that we could at least let the customer know about---even if they don't want us to fix it at the time.

In general, they don't keep busy enough to get enough vehicles finished throughout the working day.

They also don't provide complete information about what they did on the vehicle, and what the vehicle might need now, or in the future. It would help if they did that because I could let the customer know that, and possibly get more repair business.

They don't use the diagnostic equipment enough. I've got thousands of dollars invested in diagnostic equipment and computer software that could help with the repair job, but it usually sits around collecting dust.

14. The lube technicians, which are the younger generation---I have a heck of a time getting them to work---to concentrate, to be here every day, and to show up on time. I'm about as easy-going as you can get as a manager. All I expect for the most part with these guys is to be here on time, give the company the eight hours that it deserves---and then go home. That is sometimes the biggest feat---just getting somebody who really wants to work. It primarily applies to the lube technician area---getting somebody who wants to show up and work the full day. They want to take ten smoke breaks a day, and be the first one out the door, show up late, or leave early---or overextend their lunch break. That's probably the biggest problem area that I have. It could be defined as personal discipline---or a sense of self-worth. When comparing them to my older guys, you can tell that there is a complete “night and day” difference.

15. Sometimes they don't show up---and don't call in when they're going to miss work.

A few of the technicians don't interact with the computer enough for their benefit and the company's benefit. I guess that a couple of them just don't understand it good enough.

16. Speed of service would be the main issue there. Most of them don't work with enough intensity. They don't care if the job that they are working on takes all day to complete. In this business, managing time, and being efficient is what is necessary to grow the business. We need to grow the business to make more money for them and for the company.

They don't work well together as a team.

It's not really an issue of time management—they just don't care about how long it takes to do a job.

17. They don't always present a professional appearance---whether it's themselves, their work area, or their tools.

They're not always good time managers.

I would also have to say that they don't always possess critical thinking skills that will help them get to the right conclusion about the necessary repairs for the vehicles.

18. As far as the mechanical aspects of their jobs, there isn't really much that I can respond to that question. I think that they're all really good. There's not much I would want to change. I think that the couple of guys who have been here longer aren't as interested in going to training classes anymore--- I think that's a natural thing as you get older. They still do the ASE tests and that sort of thing. We also get a class through CarQuest that they'll go through. The younger guys are more geared to going through AC/DELCO training, and as I said, CarQuest has quite a few classes they offer us. One of the guys could be better personality-wise because he's not really good at talking to customers. He really doesn't care to, but the way our shop runs, the guys mainly work on the cars, and I really handle all of the customer stuff---like making appointments and everything beyond working on them much. But I suppose that's not real critical. So, I guess that you could boil it down to that I'd like them to be more customer-oriented. He wouldn't work out well in a shop where there is more customer contact. But, that all goes through me, so it doesn't matter.

19. Written communication---areas such as English, punctuation, and spelling would be an area. Some of the guys need to be a little bit more thorough, but I've got one guy who is probably overly thorough. He'll do a battery service, and I think that there will probably never be corrosion on the battery again--- it'll be better than new. When he does a diagnosis, he'll check everything to a certain point, and then he'll go back over the vehicle just in case he may have missed anything. I have a higher amount of respect for the guys here when I see some of the guys at other dealerships and when I do interviewing.

20. One of my employees does diagnostics better than the other one. One of them is better at manual labor than the other one. One is lacking in computer skills.

21. There's too much gathering in the morning. The first thing, they go through a ritual of getting their coffee and socializing---especially on Monday when they talk about what they did over the weekend. It's kind of the same scenario after lunch---getting them to get back into the work mode. Along with that would be the parts counter. When they go up to get a part, they'll sit there and chat, or lean on the parts counter for awhile. We're trying to modify that as well. In general, there's a problem with having conversations with co-workers instead of doing their job.

In reference to the area of skill level, in trying to figure stuff out, they will spend too much time on something. Then, they might end up putting a part on that doesn't fix the problem. In doing the test drive, they don't drive it far enough to make sure it's fixed. Then the customer will come back a day or two later. Then we'll end up "eating" some of the repairs. That results in our expenses going up. That type of problem could be called inexperience---that occurs with some of the younger guys usually. I've asked them to ask some of the older guys to drive the vehicle for them to make sure that the customer's complaint was verified and repaired.

22. I would say that the worst problem they have is their time management in the bays. To elaborate on that; the technician may have 2 or 3 different cars they are looking at and working on at the same time, and then choosing which car to start on, when to walk away from it to start or finish another job to get that car out. So the problem would be in their area of multitasking. I have to stay on top of that situation very intensely for them to do that. In my opinion, I think that technicians that have been in the same shop for "x" amount of years (2, 3, or 4-plus years) should have a better idea of how things need to move. That's probably the main thing I would say is their downfall. I continue to have to go out there and coach them and tell them which car needs to be worked on when and where and how, and for what reason it needs to be done first, second, or third. So, I'd say that is the worst problem area. They're all pretty much on time for work, but prioritizing seems to be their problem.

23. My technicians are marginal on their housekeeping responsibilities. I have to watch them and prod them to keep their areas straightened up and organized. But, I have to admit that I take the housekeeping duties in my shop a notch higher than most shops.

I also have a technician whom I have to push to attend continuing education classes.

- 24.** As a team, they need to be better at being organized---knowing where every tool is. I'd like them to buy into the concept of "continuous improvement." Due to time constraints that we're often faced with, they are not as efficient in applying procedures that could save time. It's kind of a "Catch 22" situation. Every aspect of the business could be improved if we strengthened our shop organization principles. Our paperwork processing could also benefit.
- 25.** I don't think that they empathize in their jobs enough. They don't meet the customer, so there's a disconnect. They need to be more of the mindset that they should put as much detail and attention into the repair of the customer's vehicle as they would do to their own. They all possess a high degree of workmanship, but there's still that disconnect. It needs to be more important to them to think of the customer. Sometimes I detect a militant attitude in the shop environment with some employees.
- 26.** They all have about the same strengths, but maybe something that they might not do as well at would be when they are working on vehicles that aren't part of the dealership's product line. General repairs aren't a problem, but if there would be a computer programming issue on the vehicle, they might not have access to the other manufacturer's software. Although, that's pretty common in most shops.
- 27.** A lot of them don't like to take the extra training classes---because they're offered after working hours. It requires them to go to class from 6 p.m. to 10 p.m. in order to keep up with current information in their field. They don't want to get involved enough with after-working hours classes.
- 28.** There is varied staff out there. There are only three guys out there who have been here longer than a year. Everybody else has only been here for about three months. There's a guy out there who has only been here for two weeks. This store has had a lot of activity within the past month. So, I'm dealing with a lot of new guys who aren't "up to speed" yet---like what the tire technicians should be doing. They should be able to change out four tires within an hour. We're taking an hour and a half to two hours. So, they are not working up to the time standards where they should be. That particularly applies to the newer equipment that we have here in the business. There's some really good machinery out in the shop area and they don't know how to use it properly to

their advantage. I'm constantly having to tell them about little things that could be to their advantage. There are some procedures that are important they should be following, and don't---like applying the proper amount of torque when they are tightening something. I have to stay on them to make sure they follow the correct procedures.

29. They do not read the estimates thoroughly. They don't spend enough time reviewing the repair order to note the parts that are required for the repair job. If a car is supposed to be out on a Friday, they may come to me on a Thursday and tell me that they also need another part to complete the job. They don't plan. Organization is the key to all of this---and most of these guys aren't organized. In some situations, they lack detail.

30. That would be their communication skills.

There might be days when we're all busy, and communication from out there to in here, or from one of them to the next person, or from department to department doesn't happen smoothly. There are gaps sometimes. That would be my biggest frustration with them.

31. Sometimes, it's the simple problem of them not following instructions and communicating.

Another area would be that they are not as electrical-minded as they need to be. This is because vehicles today have more and more electrical components. They need to realize that they need to be completely knowledgeable of the industry as it is changing. It's a very difficult thing, but that's what the certification programs and training is intended to provide.

Maybe another area that they lack in is people skills---and communicating. Although it's not a direct requirement of the job, it is a benefit.

32. They are not the cleanest guys. I try to impress upon them that the appearance of the building and their personal appearance makes a difference on how the customer perceives the business. The customer who brings in a \$40,000 or \$50,000 car may sometimes walk out to the shop area to ask the technician a question. The customer may get the impression that unprofessional work is being done by a technician who is unprofessional looking. But, the technicians feel that it's not their job to communicate with the customer, so that would be something that they don't do well. Another problem that I have here is that some of them either don't allocate the money to invest in tools, or they don't have the desire to invest in tools.

33. General repair work.

We don't really do some of the general repair to vehicles---like air-conditioning work and alignment. We don't have the proper equipment to be good at those areas.

34. They don't keep the shop area clean. Cleanliness is one of their weak points. When a technician is busy, it's sometimes hard to keep up with that responsibility.

35. Attention to detail is lacking. That would be in regard to their write-ups on the automobile repair orders.

Interview Question Number Three

What do you wish your employees could do or know---that they presently *can't* do or *don't* know?

1. There are times that they don't go to look to see if there is a known problem before they work on the car. There are times that they don't utilize all of the avenues they have. Most of that kind of stuff is on line now and you can go to the car manufacturer's website and search for a symptom or something like that and it will tell you if there is any known problem. There have been times when we've gotten far into a deal, and then they go to look at that---which they're supposed to do first. The first thing they're supposed to do is to verify the concern, and then they're supposed to check to see if there are any known issues---and sometimes they forget that step. It's something that they could actually discover online because they have access to computers. Everything is computers these days.
2. To be able to communicate better what they actually did to perform the repairs, and also to communicate better (both the technicians and the service writer) what they did to get to the core problem. The service writer needs to be able to go to the customer and ask exactly what it is in order to have the knowledge of what we're looking for. They need to be able communicate that to the technician, and then the technician needs to be able to communicate back that this is what it was that we did to resolve the problem.
3. Most of them can read and write good. With a couple of them, I wouldn't mind if they could write a little better---you know, legibly. But most of the stuff is done through the computer so they communicate through the computer and make notes in the computer, so it's eliminated a lot of that. I have a veteran core of guys out there so when it comes to their job, most of them know how to do that. They need to keep up with their routine training from the automobile manufacturer. Part of their daily routine is to put down what they did, what the job entails, how they came to the conclusion they came to--such as diagnostic codes. They start there and they have a "diagnostic tree" and follow that tree down until they find the problem. I actually have a very good crew of guys.
4. Well, that kind of comes back on what we don't do well---and that's the computer. They don't have the basic skills of keyboarding. They get stuck when they're trying to set parameters or deal with firewalls on the computers. They're not sure how to set up the connections or download the software that

they need, or set up a parameter when something goes wrong---and it's frustrating for me because we have a laptop shared by two guys. Every day, there's an issue with half of them. We have an IT guy, but he's not always able to be spread out enough.

It's important to be able to set up the parameters. A lot of the stuff we do now is with USB ports and laptops. We download information from the car, put it in the computer, upload new stuff, and there are times when you have to know how to get around some of the firewall stuff, set up some of the commands that are needed, and go back in and change it for the next type because they don't all work the same way.

5. Basic business skills and knowledge---sales minus expenses equals the bottom line, not sales minus their pay. They get confused in that area.
6. I think that they all do know what is expected of them. They know how to do the proper job. I guess that the one thing that I wish is that they truly understood how the customer sees the whole process from their point of view. When the customer pulls in here with their car, the start of the whole process is that if there is an issue with their vehicle, there's a problem that brought them here to start with, so the customer is in a "problem" frame of mind to start with. The service advisors who work up front can understand that, but the technicians are separated from them. To them, it's just another car they work on. It's another car that's broke. Sometimes they just look at it as a big piece of metal. They don't realize that the young man, or young woman who owns the vehicle is taking the better part of their disposable income to make the monthly payment on it. I guess that the one thing that I wish that the technicians understood better would be the customer's perspective---that whole process.
7. Well, we have a lot of pretty slick computer guys, but some of the guys could improve some of their English skills, and spelling skills---stuff like that. They have to be able to tell the story about the repair, so creative writing would be helpful. Some of my guys could be a little better at their typing skills.
8. I don't think that they understand the legalities of the business or the costs involved in the business.
9. I think that if they could type better (and I'm a victim of that myself), better typing skills combined with grammar and spelling. There are documents that we would type up to produce and give to a client so we shouldn't misspell the

word “alignment” or “diagnosis.” I don’t think that would present a professional image. Even though they fixed the vehicle properly, the customer reading that piece of paper might think, “Hmmmmm,” so it doesn’t look very good.

10. I wish that they could communicate with customers better than they do because when they use the terms that they refer to when they repair the car, and try to explain it to the customer, the customer has no clue as to what they are talking about. Communication with the customer is definitely an issue.

11. Obviously, their computer skills need to be a little better, but nobody has been sent to training---which would make a difference. In the body shop industry, estimates are written off of estimating systems such as Mitchell, Autotext, CCC. A lot of times there are aspects of the repair that aren’t included, and for them and for the shop, it would make it more profitable if they would know some of those things. For example, if you change a tailgate on an SUV, they’re not going to include putting the glass in it unless you put it down there. Essentially, they need to include the operations needed to get the most time and profit out of the repair job would help. So, they need to include all of the operations that are involved in the process of repairing the vehicle for the application that they are doing. There are different applications for different vehicles. Documentation fits in there too somewhat. A lot of that comes as time progresses. I had a technician tell me a long time ago that you’re going to make as much money with your pen as you will with your hands. So, a lot of it refers to the idea of working smarter, not harder.

12. Generally, in this industry, you have problems with electrical areas and electronics. It’s really hard to find somebody who is a good drivability technician. Drivability refers to situations such as if you’re driving down the road, and the car “chugs” a little bit, or the “check engine” light comes on, and being able to diagnose the problem. It basically boils down to the problem of the situation where a technician experiences the situation of the “check engine” light coming on, so they just not a code, and put a part on it and hope that it fixes it---instead of actually doing the full diagnostic work and finding out what it needs---or doesn’t need.

- 13.** This might sound overly sarcastic, but they need to use their common sense more to figure things out when they're working on a car. This goes back to your last question about using the equipment. They need to really use the equipment to their advantage. It would actually make their job easier, and make this place run more efficiently.
- 14.** I guess that at this point, I wish that I had guys that were a little better at diagnostic work. That goes along with the fact that I only have two diagnostic guys here. . . . Besides the two diagnostic technicians, the other guys are mediocre. So I'd like for them to take more classes---and learn as much as they can learn. You can never know too much. That's kind of the philosophy that I live by---take advantage of everything that's out there. They're only going to better themselves. Some of them have the attitude that if they have to take training classes, they want to be paid. I try to explain to them that they are bettering themselves when they take classes sponsored by the automobile manufacturer. But you can't get some of them to buy into that idea. I did everything possible when I was working as a technician---all the way up until now. I believed that anything you can do to better yourself is going to help you be way ahead of the game.
- 15.** Computer literacy---more basic knowledge of computer operations would be a good thing. It would be a good thing to study up on the body shop oriented programs. It's not just the Internet type of usage, it would also apply to estimating and frame-pulling types of programs.
- 16.** Perform repairs on a more efficient basis.
- 17.** Of course, that varies by the individual---in all honesty. There's not one thing in particular that stands out from one to the next.
Write legibly. As basic of a requirement as that is, they all don't always do that.
Another thing would be the ability to follow directions. They should know the parts that they need for the repairs, and make a list of the parts required before they start working on the car. Make sure that you have all the parts that you need before you start. Make sure that you know the full scope of work that is required so that you don't get into the job, and then realize that you're missing something.
- 18.** Well, it's all stuff that I have control over, and I run the shop the same way XXXX (the previous owner) always did. It would probably make my life

easier if I would have the guys more involved in looking up parts and running the shop a little bit. I put so much on myself that it's hard for me to keep up with four guys, and I guess that it would be nice if I had the guys doing more stuff, instead of just doing the technical stuff. But, I guess that I probably wouldn't change the way things work right now.

19. Most of the people who are “turning the wrenches” are not understanding the business as a whole. They don't understand that a simple half-hour job translates into income. They don't translate the dollars very well so they don't always understand why it's such a big deal when you deal with an extra hour or two of work that you're dealing with an extra 200 to 300 dollars. They're used to what they deal with and they're used to their environment and don't always understand what it means on the other end. So, because of the labor rate, we have to give some stuff away to make the customer happy and sometimes we have to give some of the automobile manufacturer's assistance which hurts their pay. They don't always understand the business part of it. In summation, they don't always understand the business and customer side of things. There's a lot of other stuff. I don't hire a lot of new people, so not a lot of people are breaking into the business. As far as what most of my guys know, I'm blessed in that area because I don't have a ton of training to do. If you're constantly breaking in a new crew, or starting a new dealership, it's painful. There's a lot you wish they would know.

20. I would like for XXXX, who is my brother, to do some of my business functions. He is the main mechanic here. If he could do more of what I do, I wouldn't have to be here as much. I would like just for XXXX to be more involved in the business end of things---but not the rest of the employees.

21. I'd like for them to try to be more efficient by being able to work on two cars at once---to develop the ability to multitask. It's like some of them have blinders on and can only do one thing at a time. They can have two cars, and be draining the oil on one car while they're doing something else on the other car. Or, they could be flushing the transmission on one car while they're putting a radiator in another car. That depends on if we have the room in the shop. For the most part, there's some of them that can do it, but there's some that obviously can't.

22. That would have to refer to the time in which they do their jobs. My technicians know how to work on the vehicles, it's just that the labor times that the guide calls for. Sometimes they cannot meet or beat the average

amount of time indicated. It sometimes takes them a longer amount of time to finish a particular job. They just need to be able to maybe be able to step back and take a look at the big picture because sometimes they get involved in something---and get lost in it. You could call it the need to be able to conceptualize---they need to be able to stand back, take a look, and be able to walk back to it. If they did this, I think that they would be able to improve in this area.

In the area of analyzing the problem, one of my technicians is very good at that, but another technician is not as good at it. As a diagnostic technician, one of my guys would barely be up to par. I would like for him to increase his knowledge of the scanning equipment that we use to diagnose a vehicle and know what to look at on the vehicle that correlates with the problem he is trying to figure out. He may have to ask another technician, “What am I looking for?” To sum it up, he needs to be skillful at a higher level.

- 23.** In general, I want them to continue the areas of continuing education coursework out of their own desire instead of my mandate. In this business, you either move forward, or fall behind. There is no standing still.
- 24.** Sometimes it’s difficult to keep up with the changing technology of the vehicles. There are some changes to the vehicles every year, so sometimes technology gets ahead of the technicians.
- 25.** They don’t have extensive knowledge of the mechanicals of the vehicles. They aren’t trained and certified mechanics so they aren’t able to do much when a vehicle comes in that requires mechanical attention. It would nice if we could offer that service in the shop to the customer. They have basic experience in the area of troubleshooting where the problem area is, but they aren’t experienced in deeper diagnosis of the mechanical issues of vehicles. If we had an employee that was certified in engine repair, we could perform the repair. So I’d like for them to have education in that area too.
- 26.** Being able to diagnose problems in other manufacturer’s vehicles in regards to software training---so if we were able to do that, we could do more with the vehicles in that respect. For more in-depth repairs on those vehicles, we aren’t able to service them.
- 27.** What I’d like for them to do is to work themselves up to the point where they are all in the top-level mechanic category. Initially, I’d like to get rid of the intermediate category of technicians. Eventually they could learn enough to be to be top-level technicians. I’d like for them to be able to do whatever needs to be done---instead of limiting them to brake work, tune-ups, and water

pump replacements. If that were to happen, the work could flow a little bit better. So, the overall answer to that would be to combine the intermediate group of technicians with the major group of technicians.

- 28.** I wish that they could go to the manufacturer of some of these machines so they could get better trained on them and get faster at them---especially these new guys here. Right now, they are getting trained by the other guys working here, and some of those guys have bad habits---so they're going to pick up those bad habits too. If they were able to go to the training center, it would probably only take a day, and then they would learn exactly what they should be doing. A lot of the newer vehicles require precision, and they could get the training that would apply to them. So, some additional hands-on training from the proper source would help them know what they need to know in order to do their job better. I've seen a mechanic take the ASE test and pass it---and still not know what they're doing. That doesn't necessarily mean that they could do the troubleshooting that they're supposed to be able to do---because they haven't had the hand-on training they need to do the job out in the shop.
- 29.** Be more organized and more thorough. That applies to some situations where the customer has to come back. An example would be where their air-conditioner isn't working when it left our shop. It is usually a situation where someone overlooked something---like they didn't tighten a fitting. Probably one of the biggest reasons this occurs is because the auto body repair technicians work on a "flat rate" basis. For example, if a job is supposed to take ten hours to complete, and the technician completes it in five hours, they still get paid for ten hours of work. Sometimes it is also referred to as piecework. So, when the technician wants to make more money, they work faster. If you'd be paid at an hourly wage, you could take your time to do the job, but here, we're involved with insurance companies----and the insurance companies want them in, and want them out.
- 30.** There is a line of work in this business called "paintless dent repair." Currently, we don't have anyone here who does that. I think that it would be nice to have somebody "in-house" because right now we have an outside vendor who comes in and does that. There's equipment issues involved with that too. We don't have the equipment to be able to do things like that---that we would want to do.
- 31.** Well, everyone has their individual areas of weakness. One of the guys out there is lacking in the area of computer skills. He made choices 20 years ago

that are catching up with him. He didn't pursue the schooling then that he should have. He didn't get the training in that area he needed. He isn't knowledgeable enough of the electronics in automobiles.

They don't know enough about how the overall business is run---what it takes to make a profit. It's good for them to understand this if you expect them to work as a team. So, they need to be more knowledgeable of the importance of teamwork because that can contribute to the overall operating efficiency of the business. Sometimes the parts of operating this business can change on a month-to-month basis. The insurance costs, the taxes, or the price of parts could go up.

32. In general, most customers don't know exactly what their car needs or when to do certain things to it. So, the most important thing that I would like for them to do is to educate the customer about those things. I would like for the technicians to be more concerned about the customer's "vehicle welfare."

33. Air-conditioning work, alignment work, and tire work---but a lot of that has to do with the fact that we don't have a lot of that type of equipment or stock parts for that type of repair.

One of them needs to be more experienced at rebuilding import vehicle transmissions.

34. They should take additional schooling that covers new things happening on vehicles. They could take more classes in order to keep current with vehicle specifications and repairs that the industry demands.

35. They could all be more detail-oriented.

I wish they could compose, and write better. If they could envision themselves in my position, and realize what I need to know to feel confident enough to speak to my customer, they might better understand the importance of being more thorough and complete with what they write on the repair orders.

They could be better at the advanced diagnosis that is required on later model European cars. The European cars are harder to diagnose. In some aspects, they are very unique. We are willing to pay for any training that they want to go to.

(Note: In Europe, technicians are respected as much as medical professionals.) It would help if the older employee would be more familiar with Internet related tools and repairs.

Interview Question Number Four

If you could suggest something the individual employee could learn that would benefit them and your organization, *what would it be?*

1. More computer skills.

These cars have voice control and touch control. They're really moving fast with all of that technology. I think that some of the guys are having trouble keeping a grasp of that and just keeping up with that because it's happening so fast. Your car can be tied in with your cell phone. Some of the new car dashes have touch screens on them and voice command programs. The technology is moving pretty fast and we don't always have the time to keep up with that. They took the mandatory classes, but there's only so much they can do and they probably need more hands-on training. A lot of the training nowadays is rote training so they go on the computers and take a test but it's not actually going through the programs and touching the stuff.

2. I would have to say that the academics part of the job more than the skill part. I think that we're learning the skill part of it, and I think that we're getting to the core issues. I think that if the technicians could improve in the area of communication and mathematics, they could get to it faster. Then, the technicians could relate to us (service managers and service writers) exactly what the issue was. So much of it anymore is the electrical part of the job---electrical diagrams---being able to read the schematics. That is such a big part of it. Half of the guys back there have trouble doing that. They drift toward the top three or four guys we have, and ask them which diagnostic chart to follow---and how far to follow it---what "shortcuts and stuff." The flowcharts we have are very good. (It says) CHECK THIS CIRCUIT---is it above five ohms or below five ohms? If it's below, go to step three. It's so academic and so in order, and they still have trouble doing that. Following directions, I guess. Seek the key things we always look for, and if you do, you'll get to the right answer---99.9% of the time. You need to be able to follow those charts, and I think that is something we need to do a better job of teaching---follow it--make it happen. Technology is there. It has far and away outpaced everything else.

3. I guess that maybe when it comes to the electronics of the vehicle, some of the guys need to be able to follow the schematics better. They need to get familiar with them so they can learn to read them a little bit easier. They should be sure to use some of the resources they have at hand, and use the technical support team. Sometimes I think that they don't think further when

they come across some potential problem. If they'd follow the schematics, they might find the answers they're looking for. They could learn if they use these tools they have at hand more often.

- 4.** Well, for that, I think that it's to learn to think logically, and methodically. In the old days, you used to be able to pop the hood open, find the broken part, and replace it. But now, you have to be able to pinpoint the problem. You have to be able to do that by eliminating some possibilities, understanding how the whole system works, what the flow and the progression of everything is because to make money in this business, you have to be able to do that in a timely and accurate fashion.
- 5.** Well, they do pretty good with teamwork---maybe not 100%, but nobody does. But, maybe to have more respect with the other positions they are working with. You have advisors, you have porters, you have technicians. If you've never been in the other person's shoes, then you don't understand what they go through. People take things for granted sometimes without knowing what that other person actually does. If the advisor is facing the customer who is screaming because they had to bring it back because it wasn't fixed right the first time, they need to be a little more sympathetic to the other guys. It's the same thing with the guys who are washing the cars. They shouldn't be treated like they're a nobody because their job is important too---even though it's just washing a car. If we didn't need it, it wouldn't be a job.
- 6.** I guess that you could call it the psychology of understanding the customer---to try to figure out and understand where the "customer's head is."
- 7.** Maybe they could benefit from having their communication skills improved upon. Their tone and attitude could always stand to be improved on too. This would apply to communication with customers and other employees.
- 8.** I would love to have the technicians write service orders, and have the writers become technicians for about a week. The ideal thing would be to switch various different job functions throughout the dealership because some people think that they have it harder than the other guy. If I could give that guy a week doing this job, a week doing another, and a week doing yet another job, I think that they would have an appreciation for other people's jobs. They could even have my job for a week---not to exclude myself from the idea. I think that it would give them a good overall appreciation of what goes on. They know it, they just don't see it per se. They just don't realize the extent

of what a person does. I also feel that there should be constant training in order to stay abreast of the technological changes that come about.

- 9.** Focusing back to item number three, it would be better keyboarding skills. That right there relates to the fact that technicians all work on the idea of time. Time is money. They might not like to type in a story because it takes time because they're not proficient at keyboarding. We need to start emphasizing to our technicians that the keyboard is a tool like the screwdriver, but they don't make that connection, but they're getting there. It's interesting when you see things from my point of view...when you see a guy who is 45 years old and working on a car, and you see a guy who is 22 years old and working on a car, and even some of the guys who are in the 30's, you'll see that many of their keyboarding skills are much better because they are used to it. They've been on computers. They grew up around them in high school, and many of them have some college where they gained experience with different computer applications. Another thing I think that they could use that would make them better would be an understanding of the business model of what goes on---such as what do we do. We are a service department. We fix cars, but ultimately, we are serving consumers. And again, that's not a rampant issue, it's just a general overview from a guy who has seen 60 different technicians from three different locations in my career---probably more technicians than that. I was a technician myself for about six years at a dealership, so I actually did that end of the job. Although many of them do, but if more of the technicians could just sometimes see the concept better of really what we're doing. Yes, they produce hours for their income to put bread on the table, but we serve customers, and sometimes that isn't clear enough. The ultimate goal is to serve more customers, and the better we serve them, the more bread we'll have on the table.
- 10.** Be upfront more about what's going on in the shop because it's a communication thing. They need to help keep us informed. We have a cycle time that we have to repair cars by. They don't look at the cycle times to make sure that everything is getting done the way it's supposed to be done. The cycle time is very important to the insurance industry. Cycle time refers to an example of a situation of a car coming in on a Monday, and if it's a 4-day job, it should be done on Thursday. We write that on the outside of the repair order jacket---that it needs to be done by Thursday. If they would take a little more time to look at that it would benefit us because the cycle time is something that we get graded on by the insurance companies. If the car is written up as a 20-hour job, it needs to be out of here in four days or five days.

They determine the number of days by the amount of hours that is written up on the vehicle.

- 11.** A lot of that goes along with what I was saying about learning more about the operations of the shop---learning more and getting a better understanding of how long it's going to take you to do a job, and what they're going to pay you to do a job. Sometimes you're going to ask for four hours to fix a dent, and they're only going to pay you three, and it's only going to take you two, so that's the whole point. Try to get whatever you can out of the insurance company. Being able to explain to the insurance company or adjuster the reasoning behind why you're asking for what you are---as far as time-wise to repair this or replace that, and breaking that down into simpler terms for someone.
- 12.** Time management---that's one of the biggest things. Obviously, with an increase in productivity, there's more work that can get done, so everybody will be better off.
- 13.** I would want them to learn to use the power equipment more. Although I have air-powered wrenches that would make the job go easier and faster, I caught one of them the other day using a hand wrench instead---which was slower and harder to work with. They could also familiarize themselves with the computers and diagnostic equipment.
They could also try to be more efficient in getting the repair jobs done so they don't have to spend so much time on one job.
- 14.** Learn everything that you can learn.
Take advantage of everything out there that you could possibly learn. There's more than enough manufacturer training, and there's more than enough of other kinds of training that could provide the opportunity to better yourself. It's worth it---and it's priceless.
- 15.** It would help to have a higher level of computer literacy and become more knowledgeable of measurements and provide a higher quality of input about the repair that is needed for the customers' cars.
- 16.** Teamwork.
- 17.** Better communication skills would be the main answer to that question. They should be able to convey their thoughts in a manner that makes sense and is logical.

- 18.** The main thing I guess would be that training benefits the employees, and obviously the shop. If the older one was a little more interested in computer training and stuff like that. The older ones who have been here the longest aren't looking to be doing much of that stuff. They don't take the ASE test anymore, and there's a lot of value to having the ASE certification. That doesn't necessarily make them a good mechanic. That's the way they feel. They're both competent mechanics, and they don't place much stock in what's on paper---and stuff like that, but that stuff is so important. The younger guys---they're eager in doing whatever I ask---as long as there is training . We do have to get XXXX to do his ASE stuff. I have to push him to do that a little bit.
- 19.** Everybody wants to pick on the service advisors. They don't think that they do their job well. They think that they make too much money, but none of the technicians want to do the service advisor's job. They kind of generally understand, but if you could actually put the technicians in the advisor position for about a week, I think that they'd have a better understanding and appreciation of what all goes into it. We all get used to what we do, and we don't think outside of the parameters---the other things that go along with our jobs. So I'd have to say that the employee and the organization would benefit if the technicians had a better understanding of all of the facets of the business.
- 20.** More managerial skills---when I'm up in the front end of the business (the office area), XXXX does a pretty good job of keeping the guys in the shop going, but if I could get him up front to do some of the write-ups, I wouldn't have to be here quite as much. I'm not able to take a 4-week vacation. A week off is about as much as I can get. XXXX doesn't like to work in the front end of the business, but he'll do it when I'm gone because I ask him to.
- 21.** Learn to multitask. It would increase their efficiency and thereby increase their paycheck, and increase our hours---which equates to labor dollars. It would also be beneficial to the customer too because it would get them in and out quicker. More training would help. There's some specific training such as emissions-related repairs, evaporative training that involves fuel systems. There's also the electrical area---and a lot of that is tricky, which the younger guys don't always have the training or knowledge. The evaporative/emissions area of a vehicle requires a lot of knowledge, so extra training would help out there.

22. Take training courses that are offered by our affiliated vendors and the company sponsored courses. They offer specialized classes for air-conditioning, suspension, diagnostics, and new systems that might be coming out on the market for newer vehicles---such as air-bag systems. I think that if they were to take these classes and try to learn about new systems, I think that they would have a better understanding of them in the real-world shop. Knowing about the basics of problems would help them diagnose the vehicles correctly. If they would do that, they could help themselves which would enable them to make more money---which would help the shop make more money. Another thing that they need to work on is written communication---reading, writing, spelling, and proper grammar.

23. The general answer to that would be “anything that would make them more effective at their job.” Continuing education would be the primary thing that would benefit them and this organization.

I currently have a technician who should be more proficient with using computers. We are now fixing cars over the Internet. We had a vehicle that couldn't pass the emissions test because the check engine light was on. It was on because of a code for an oxygen sensor. But, the oxygen sensor was not the problem, it was the software in the vehicle's computer. It was set too tight. It was necessary to rewrite the software in the computer in order to loosen up the test parameters. We accomplished this by plugging into the Internet, taking a credit card and buying a flash file (just like you can buy a music download---we buy an information download). This gives us access to the website. This gives us the manufacturer's approved repair in the form of an electronic flash file. We then download that from the Internet through the interface modules into the diagnostic plug of the vehicle which is under the dashboard. It then goes into the vehicle's computer and rewrites the calibrations in the computer. That then stops the false code triggering, that then keeps the light off, and that allows the vehicle to pass the emissions test. We fixed this car without raising the hood. If you have a technician who is good with a hammer, wrench, and a screwdriver, but doesn't know enough about a computer, he won't be able to fix a vehicle such as this one. Electrical knowledge is important for an automotive technician to have. Speedometers and brake systems on cars are now dependent on electrical systems.

24. I believe in cross-training, so even my paint technicians are learning to do estimating. When you learn estimating, you can go into customer service. That's one of the most important steps in being able to take care of a customer

when they come in the door. The main auto body technician I have already does estimating and does deal with the customers. He could learn more on the suspension and alignment side of the business.

- 25.** If the employees would have ASE (Automotive Service Excellence) certification in the area of automobile mechanics it would help. But to take advantage of that knowledge, we would also need equipment and space to attend to that potential problem area. We would have to expand to be able to do that and we don't have the ability to do that because we're "landlocked" at this location. My attitude toward doing work in the area of mechanical repair is that if we can't do it properly, we shouldn't do it at all. They need to understand the complete mindset that we can't leave them work to their own standards. There has to be a system of "checks and balances" for the shop's standards.
- 26.** Cross-train into other manufacturer's products. That would apply to every shop technician.
- 27.** The intermediate-level technicians could increase their skills to the point of being readily available to do the major repair and the intermediate repair.
- 28.** Get the technicians to go to the manufacturer to be familiar with the equipment and be able to operate it better. I have training next month for two days that the manufacturer of some of the machinery here is sponsoring. It's going to focus on the equipment they make that we have here in the shop. I'm the service manager, so I'm the overseer, but I'm not the one who is doing the repairs on a regular basis. There should be a class like that for the technicians. They should be able to go there for a day to see the equipment and work with the equipment so they're familiar with it. This could help them get faster at their job. The training could make them better, and faster.
- 29.** Elevate their computer skills to a higher degree.
We have a computer program called "ALLDATA." Some of the technicians have a problem getting into the program, or finding things in the program. Most of the people here are older---who didn't grow up with the computer. So it can be a difficult job when the computer program is required. The measuring system for much of the repair depends on computer skills being used.
- 30.** A lot of the things that would benefit them and the shop fall into the category of what is now required. They have to go to training every year. There are

online courses that we have to do every year in order to maintain certification in various areas of auto body repair. It is an industry requirement.

Another thing would be to learn paintless dent repair and be familiar with the technology required in that field.

31. The first thing that comes to mind would be people skills. Another thing would be to understand the things that cause a lack of efficiency. It would help if they understood how to, and the importance in removing roadblocks so that efficiency can be improved upon. If they realized the importance of effectiveness and efficiency in their jobs it would make this place run smoother and be more profitable.

32. Every technician should be cross-trained.
Every technician should also be customer-oriented.

33. More experience---because the more you know, the more you can do---and the easier your life becomes. A lot of the stuff, you learn by trial and error. Training can only give you a limited amount of overall knowledge. ASE (Automotive Service Excellence) classes are a plus, or any additional kind of training you can get into can be of benefit. Even if it's something you're not going to use at the present time. It's better to know it and not have to use it than have to do something, and not know how to do it.

34. I'd like for them to be able to communicate better with the customers. To learn how to really talk to a customer would be an asset. An important reason for this is because the customer is more willing to believe the technicians out there in shop rather than the front desk person. Whenever possible, I try to take the customer out there to the shop and show them the problem. It would be helpful to have the technician communicate with them directly about the problem.

35. For two of my technicians, a typing class would help them be more proficient on the computer.

For two other technicians, some type of a writing course would be helpful. Due to some of the immigrant customers we have, it would be great if even one of the technicians would take a Spanish class. Another language proficiency that would benefit our business would be Bosnian.

Interview Question Number Five

After reviewing the list of courses required from the colleges, *what are your thoughts?*

1. Well, first of all, they should be well-rounded. There's no doubt about that. I just kind of made a list of what I consider to be important:

- * social classes
- * accounting classes
- * business classes
- * leadership classes
- * composition classes
- * big emphasis on computer classes
- * health & first aid classes
- *some math classes

2. The most obvious is health. With today's environmental conditions, especially in the automotive field, that is something that should probably be touched on. It hadn't come to mind until I saw that. It doesn't appear to be something they dwell on, but we're working around a lot of chemicals and there are hazards just in the operation of automotive engines---emissions and so forth---so that's something. I think that the math definitely needs to be addressed, and anything that relates to communication. I think that the electronics is a huge, huge, interest. Everything on these cars now is electronic controlled---everything. I think that's something I should have dwelled on---but that goes without saying, but it's extremely important.

3. With the guys, what I'd be looking for is technical training, maintenance training, and what it takes to keep a car going, and how to perform general maintenance on a vehicle. When I'm looking for a technician, of course, I want someone that scores high on their technical training and I'm usually looking for someone that has gone to Ranken Technical College. Ranken is my main source. Part of that reason is because I've been down to Ranken for training courses when I was a technician and I was pretty impressed with what they've got down there and with what they do and how they specialize in our automobile manufacturer's product.

I can also see where English courses, as far as being able to communicate with the customer is a good idea. I know that Ranken does a lot of that with their training courses and with ASM (Acceleration Simulation Mode) training and maybe some of the basics that are very helpful. They can understand what you're talking about and the customer has an idea of what's going on. I mean that all of the techs are pretty good about being able to talk with the customer. Most of my guys, or the core of my guys have been here ten years, or more, so I have a very good group of guys here.

- 4.** Courses that help with test-taking are important because some of the guys are intimidated by that. They know the information, but they can't seem to get it across in some of the tests they have to take.
I think that Introduction to Business and Business Management is a good idea because they do need to understand what is expected of them and why and how it relates to the real world. Because, they often come in here, and it's not so much now, but I think that some of the guys who have been around awhile seem to think that we're making money, this is a company, and the company makes money, and the guys in the back just work---but there's a lot more to it though.
- 5.** Well, I didn't know that some of these courses even existed, so I'm kind of shocked by some of it. But, some of these things can be pinpointed, and make sense---like the thought concept of Understanding Business.
Psychology--- could relate to communication coming from that area.
I understand general education to be important to relate to the basics of the car industry.
Is history necessary? If you're going to school to be a technician, I don't understand how that's going to benefit you. What's history have to do with working on cars? The only way I can see where that could benefit you is if you happen to have a conversation at the coffee machine. So, I don't understand some of the usefulness of the courses, but some of it I do. So right now, I'm running about 50-50 on it---I guess.
Basic computer courses, and the management course area, and human relations, maybe accounting, and business management. Is there anything on here about resumes---because these are the things that I would recommend for someone who wants to be a technician I'm already familiar with your mechanical side. Your personal side is what's going to get you the job. What's on the paper, and your personality is getting you the job. You'll be able to show me your skills later. You'll be amazed at how many people don't do that. I mean, I give them some slack, because that's the mindset of a lot of technicians that get hired---but it doesn't have to be that way. It's all about personal presentation.
- 6.** I can understand the relevancy of all of the courses on here, especially if the end result is an associate degree. I do believe that a technician that comes out of an associate degree program is a better technician than someone who goes to a technical college and gets strictly the mechanical repair training. Part of that refers to what I said earlier about the documentation that is required on the job, the understanding of technical documents such as wiring and schematics, and the ability to use electronic test equipment. All of these things cross over into automotive repair. They've got to be able to use a computer to draw the next job, and to look up service bulletins for electronic service information. Most of these courses listed here are good general studies classes that someone needs to be a well-rounded person. I noticed the first-aid classes. We periodically do some first aid training here. We've also had CPR

classes before and other first-aid classes. We need to always have someone in the place who has an understanding of first-aid. I don't see anything that I would consider to be unnecessary. I see a general need for all of it. I saw that there were a couple of psychology courses on the list.

- 7.** In our line of work, mathematics is very important. English skills are very important. A well-rounded education helps these guys to communicate with other people. They've got to know measurements. They've got to know communication skills. They've got to know all of that stuff to make it. I don't realistically see the need for history. As far as the rest of the list goes, accounting---the technicians do some work with that area. It applies to keeping track of the time they spend working on cars. But as far as the rest of this list goes, other than the history courses, I would agree that they help in making a well-rounded technician. I can see where a physics course can be beneficial too because hybrid and electric cars will require an understanding of the proper handling of them or else they can encounter some serious problems. It will help the technician in being able to communicate these areas to service advisors and customers.
- 8.** Obviously, you have to have all of the technical courses. Obviously, the area of math is important, and obviously there is a need for computer courses. That area is bigger than you'd think. Now, I do not need science, psychology, humanities, or fine arts classes. Political science would not help, and history would be a waste of time in this business. I would really feel the need for one of the classes listed here which is "Core Values and Ethical Decision-Making. I think that is absolutely number one because this can be a phenomenal business, but it can be a seedy business if you let it become that---does that make sense? For me that's a big issue. I've got good people working here--- but it's taken a long time. There isn't anybody here that I wouldn't let work on my mom and dad's car. That's just the way I feel. If you don't mind them working on your mom and dad's car, then they're okay. If I would have concerns about someone working on their car, then I don't need them. I don't want them in the shop at all.
- 9.** I didn't fully understand this, but I think that I did. I can just give you the general pros and cons. Overall, it's good when we think about a technician. I went to Ranken Technical College, but I did not go through their two-year program. I did their night-time program because I worked full-time during the day, so I earned the certificate in automotive maintenance---not a degree per se. But I did earn my four-year degree at the University of Missouri-St. Louis. Business was actually my major. I look over these, and the courses are good. As I was looking at the list and going over them, I think that the courses are good, and again when we look at courses like Introduction to Accounting and Introduction to Business, I think that it helps round out their understanding of business. I'm not trying to say that they don't "get it," but

I've dealt with technicians who are 65 and technicians who are 16, and I've seen a lot of skill levels between those ages.

The Human Relations course "jumped out" at me when I think about the dynamics of working with service writers, and serving customers. I kind of tell the guys that they are on stage every minute they are here. You have to realize that somebody could be watching what you're doing, or observing you, and I think that is important to understand. In the words of Walt Disney, "everything speaks."

As I continue to go through these courses on the list, and they all looked pretty good, and I got to the computer-related areas, and I guess that maybe I passed them up because I already covered keyboarding, spelling, and grammar, then as I continued to go through the list, I realized that the composition classes were in the back part of the list. Those kind of jumped out at me. With computer applications, when you get into the mega-shops when the technicians are 200 or 300 yards away from the service manager, so the ability to communicate without being face-to-face is huge. Whether that communication is by phone, or by text, and more often now, it's becoming more and more prevalent for the communication to be coming through the computer. Here, these guys aren't exposed to that because they are about twenty feet away. But, I have been in a shop where a guy is 200 feet away, so you have to use technology for efficiency, and use that technology productively and correctly so that somebody else doesn't have to fix grammatical issues or spelling issues so that you can properly get your information to the next party so that they can do what they need to do. And again, all industries are going to be computer-based. Even the diagnostics on the automotive side, you are using laptop computers, and something that I hadn't noted on here is that you have to understand the "dos" and "don'ts" of computers. If you hook up a computer the wrong way on a car now, you can "fry out" a computer---not your computer, but the car's computer. Obviously, that would be a bad thing.

With the general rounding out of the courses as I went through them, I kind of wondered about trigonometry. That, and calculus for a technician, but they are obviously good classes. Again, you're dealing with some mathematics. It isn't the days of yesteryear where we used to overhaul a lot of stuff.

Component replacement is the more preferred method today versus overhauling transmission where you had to measure down to hundredths or thousandths of an inch, but that goes more along the diagnostics side of things. So, that's kind of my "rounded out" view of the list, so I hope that's what you were looking for.

- 10.** The key thing I can point out here is that my bodymen are older, so they didn't grow up in the computer age. Everything we do in the shop now is computer-based. Taking computer classes now to get into our industry is very important. We used to estimate by hand, but now everything is computerized--from estimating the job, to repairing the job, to mixing the paint for the job. So everything is computerized. Nothing is done by hand anymore. I was glad

to see that area about computers, because a lot of people in our age bracket didn't really know what computers were. Although I had typing in high school, we had manual typewriters. We didn't even have electric typewriters. But now, I use a keyboard all day long. My bodymen use a keyboard, but they struggle, because they never had the keyboard to use before. We use computers, and math---because everything we use today is in the metric system. We pull measurements on the frame, we pull measurements on the unibody, and everything is metric system referenced. English is something they will never use.

- 11.** One of the things that I see that surprises me is that there is a lot of geometry involved in auto body. There are a lot of angles and measurements required, and I don't see any geometry classes listed---or maybe trigonometry. I do see the Survey of Calculus though. There's a lot of geometry required in the body shop side of the business. Now, mechanical-wise, there's a lot math involved there too because you're dealing with a lot of electrical issues as far as ohms, and how far to push one---that fits into the body shop area too. Computer courses should be required. With a lot of the guys out there now, to check on certain repair procedures, you have to go online a lot of times to get specifications or certain repair procedures. A lot of that is involved. Also, you need to have a good base of communication because that's obviously the basis of what we do. Business and management is good because you should be able to know what it takes to do in the office, to an extent---along with what goes on in the shop. As I mentioned, I've been on both sides. Psychology and sociology is very good also because you have to relate to a customer, or an insurance adjuster. If you're a mechanic, you have to relate to a service writer to relate to the customer aspects of the job that need to be repaired---to put it into terms that they can understand in order to justify what you're trying to sell them. In reference to the area of health and wellness, you need to be in shape because we do a lot of manual labor. Even mechanics do a lot of manual labor. I've seen a lot of them struggle, and they'll end up with bad backs or on the job injuries from being overweight and out of shape. It does affect a lot of them. Not that it's a requirement, but it would definitely help every worker to be in better shape. I think that it would help every company also. It could help keep their health insurance down.
- 12.** I suppose that a history course helps "round out" the employee. I think that the courses could be improved if they were a little more directly related to the technical aspects. I'd like to see a core curriculum focused on the automotive field. If the courses could relate more directly to the automotive technical field they could be a lot better.
- 13.** I don't see any reason why a mechanic needs a history course. A psychology course might be helpful when it comes to dealing with the customer and trying to figure out how to find and correct a problem.

There needs to be a common sense course listed on here.

Some extra emphasis on being able to use, and be comfortable with diagnostics would help them on the job.

They need to learn what a proper work ethic is.

They need to learn business principles to better understand what I have to go through as the owner of this place. It costs me \$800 every day I'm in business. If I only take in \$750, I lost \$50 that day.

- 14.** It looks like all of the courses could be helpful, and they're designed to better the technician.

I'd say that any of the sciences would be helpful, although I don't know if they'd be able to get much out of history or government. But, business, bookkeeping, leadership---that's all good to know.

You need communications skills, writing skills, English skills, interpersonal communication. But come to think of it, I guess that maybe history and government courses could play into the whole area of beneficial educational courses. I suppose that there isn't anything on the list that isn't a good idea. Physics is a fantastic idea. It's one of the classes that I took at Ranken Technical College. It was an awesome class. What that course does is to get your brain working and gets you thinking about how doing one thing affects another.

NOTE: This interviewee has an Associate of Applied Science degree in Automotive Technology from Ranken Technical College.

- 15.** It would be a good thing to learn at least a little about salesmanship, accounting, and bookkeeping. That goes along with the business concept of "it takes money to make money."

I would strongly recommend a course like "Introduction to Computers." In general, I would suggest more computer classes than any other area. I know that St. Louis Community College at Florissant Valley offers a computerized estimating class. A lot of my guys know how to write estimates. They just don't know how to put the material into the computer the right way. The way that most of them learned how to do estimates was to refer to a book. They'd look up the car, and the repair needed in a book, and it would tell you how much to charge for each operation. Now, you just put the information in the computer, and click on what you want it to do. Maybe it's just too simple for them.

- 16.** Actually, I'm not a big "fan" of those college courses. My feeling is that hands-on experience is more important. I'd rather have a technician who comes to me who has had ten years of previous experience than someone fresh out of Ranken Technical College. When it comes to the technical knowledge that is needed to perform diagnostics on a vehicle, that is something that can be gotten from taking seminar classes that are offered by the company that supplied us with the equipment. Previous experience is critical. There are some situations where they need to go to a computer, but

they don't have to be experts at it. In general, they can function well with very little computer knowledge.

I don't think that teamwork is something that can be learned in a course---and that is what I really need.

- 17.** We don't really need deep thinkers here, but we do need good communication skills.

I don't see a lot of reasons why sociology, history, or political science are important to a technician.

I don't think that a college composition class is really necessary because most of the information that they need to convey can be done in single sentences.

Communications classes would be good, but not necessarily college composition classes. The information that they need to know to do their job is on the repair orders.

They should be very computer literate. They should be able to access the Internet to be able to get information that can help them to diagnose and understand the repair that is needed. So, the computer courses need to be good, specific courses designed for the technician to use in their work environment. With today's cars, you can't get by without a good understanding of how computers interact with the cars.

Health and first-aid courses are a good idea because I've seen technicians develop back problems due to being bent over the car throughout the day to perform the repairs needed.

- 18.** Well, I think that they help make the technician a well-rounded individual. I know that Ranken is the college that I have a little experience with. They run you through a little bit of everything. They require some math and some English and all that. I was a graduate of Bailey Tech years ago, and I took straight automotive courses, and I think that it served me okay. But there's some stuff here---like I can't see that spending time going through history and those sort of classes would be worthwhile. Definitely computer stuff is good now---which you didn't have when I was going through. English is good to have. It helps them communicate. Any kind of communication class is probably good. Anything that pertains to automotive repair is good. So English and some math classes are good. There's some math involved in some of the stuff that you have to do, but not much. And computer classes are good. Even a typing class is helpful. In my position it makes me wish that I would have taken typing when I was in school. I never thought that I'd have a job where I'd have to type. Now, that's one of the hang-ups in the flow of the shop. It's me---when it comes time to make out the ticket for the customer. I think that a school like Ranken that requires other stuff, rather than straight automotive is a good thing for the individual---especially nowadays. It still helps if you're a well-rounded individual. It helps in the way that you work in your job and the way you can relate to other people. Anything in the area of communication is good, but I don't know how much science stuff can help---or history.

19. I can see where some things might not seem like they would fit in that well for technicians, but I find that the colleges that seem to require more, well their people seem to be at a different level. I've got a person that was here that we hired who went to Ranken, and I've got another one who went to a technical school in Chicago, and there's definitely a world of difference between the two. I've interviewed people from the Chicago school, and I've interviewed people from Ranken and you can tell that there is a big difference. I don't know that if it's because the reputation that's out there or if it's that people understand that at Ranken, you're going to have to do a lot more to get through it. So, some people choose other options, but some of the people who were from this area, went to the Chicago school, and then came back to this area. So, I don't know if they didn't go to Ranken because there's some of these things that they might not have been able to get through---so they went to the other school. I don't know what their thoughts were.

I think that an English course is a good thing for some of these people because the technicians write the story on the computer. It's sort of a legal document. Those who couldn't punctuate and spell made my job a lot harder when I was an advisor. I worked out there for years. I'd have to re-do the whole story because you don't want the customer to see what they wrote. I can see where an English composition course makes you able to put thoughts into words and punctuate correctly.

In reference to computer knowledge, there's not a whole lot that they have to do. They have to be able to navigate through three or four screens, but then, all of your diagnostic equipment and all of your books these days are all on the computer. So, you have to be able to navigate through all of that stuff. The higher the level of computer skills the technicians have, the more efficient, and the better they will be.

Mathematics may have been a little more critical than it is now. Everything is on the computer now. They provide so much information. You can check voltage and things like that, but there's not a lot of conversion. The computer does most of those kinds of things.

With the English composition, you're also doing a lot more reading than you used to have to do. You have to make sure that you're understanding everything that you're reading. So, reading and writing is important to the technician's job.

20. Computer courses would be very helpful. None of us in the shop are really experienced at computers. So, I can see where some of these computer-related courses would definitely be helpful. We're an AC/DELCO shop---what they call a TSS (Total Service Support) shop. In regard to automobile technician training---we get all of that for free. We can go to as many courses as we can handle throughout the year. They probably offer 25 courses a year. They do have some managerial courses too---bookkeeping related---as part of their program. I've been to a few of those.

I'm not so sure about the usefulness of history, but I would think that mathematics would be good. Computer courses would definitely be useful.

Everything is on the computer nowadays. There are some cars that have eight to ten computers on them.

The main areas of the list that I think would be beneficial would be computers and math.

21. The first ones I see that would help would be:

Preparation for Employment

Occupational Leadership.

Introduction to Business would give them a little bit of a foundation of what goes on in a dealership. Fundamentals of Speech would also be good for them. Interpersonal Communications would also be helpful, or Oral Communications. I think that these types of courses would help them in their job as a technician. Almost any computer course would help because a lot of the stuff on cars is computer-related nowadays---even simply being able to use e-mail. Accessing websites and some of the basic computer applications depend on computer knowledge. A little psychology probably wouldn't hurt them. Some courses in the social/behavioral science area would probably also help them to be able to communicate with the customer better and understand the repair order and what they need to accomplish. For example, it would be important that they would understand that the customer has been hearing noises, and it's their second time back---and they're getting frustrated because they just bought the car. The technician should understand that they need to take a little extra time to find the problem---or find somebody who can help them find it.

Preparation for Employment would be a good course that could improve their work ethic a little, and they'd have a better idea of what the owners and bosses of a business are looking for.

There can be mathematical applications in the technician's job. I don't think that there's a need for a course as deep as calculus, but there are definitely some mathematics involved.

Anything that is related to the electrical area---such as being able to read electrical diagram would be important to know. They need to know how to work with electronics so they know how to measure and read ohms and use different test equipment.

22. Computer-related courses are definitely important because the technicians use the personal computers all the time for things such as diagnostics, or for looking up any kind of issues that the customer conveys to us that they have experienced. Computers, in today's day and age are probably important for just about any job. There's probably not a single job where computers are at least not semi-important.

In regards to the English and communications area; reading, writing, speaking---those are all very important because the technicians' job involves all of those things. It involves being able to fill out a ticket properly, legibly, and correctly, and being able to spell the words of the parts and labors that the job requires---and being able to elaborate on those issues when they come up.

I as the service manager, need to have those skills to be able to sell the job, and a lot of times I have my technicians speak to the customer. They don't do that all of the time, but there are times when they do speak directly to the customer. So, for them to speak clearly, make sense, and use proper grammar would obviously be a very good thing in that situation so they don't look at us like we're a bunch of dummies. So, I would say that English and communications would be very important. Now, getting into the higher levels of it---to where you're worrying about every detail of how the English language works (such as adverbs, adjectives, and all that kind of stuff), I don't think that it's that important for them to understand things at that level, but to be able to speak and communicate what they're trying to get across is definitely a must. Also, having knowledge of English Composition is important for reading and writing reasons is important because I've noticed that you can have a technician that can work on almost any car and diagnose any problem, but you're usually hard pressed to get a technician who is good in that area who can also read and write good and legibly and who can communicate exactly what they're trying to get across when they're trying to explain something to you. I can show you some of the write-ups that my technicians have done, and there are many examples of where they can't spell some basic words---even the word "basic" would probably be spelled "basik." I think that a lot of the people who become technicians are those who didn't do the best in high school or college, but they learned how to use their hands--and that led them into becoming adults who aren't the best at reading, writing, and speaking. I have a technician who can hardly read and write. But, I don't think that there's a single car that he can't fix. But, if he could read and write, the issues that I have with him would go away. I have to spend time asking him a lot of questions because I'll give him a simple item to fill out, and either I can't read it, I can't understand it, or it's not filled out correctly. That causes me to spend time going over the item when I needed to spend time putting together an estimate and speaking to the customer, but instead, I have to spend time with the technician so he can "decipher" everything he wrote down. That's why English Composition caught my attention---because of that specific reason. I've worked at two other shops before, and I have to say that the technicians that I work with here don't measure up in that category. Often, if there's something that they have to write down, if it's important, I'll write it down for them. When they do have to write something down, they will ask me how to spell words, so I'll spell words for them so they can write them down correctly. This is definitely an area where I wish they knew things like this. It would make things much easier and smoother for me.

If, you asked me about these courses being important for a service manager, I would say that every area would be important to be successful and wanted to learn and know the most that they could know to do their job. There's no way that a technician could become a good service manager---especially with all of the bookwork that I have to do, the numbers that I have to deal with, and

dealing with the customers. You have to have an idea of how to do all of those things in the first place, and how to manage your time doing it. The area of accounting and bookkeeping is something that I learned how to do here, but that wouldn't necessarily be something that would be beneficial to the technician. Accounting would be helpful if the owners asked me for my help in doing the books. It would be something that as a service manager, I'd be able to point out things such as, "we spent too much here," or "we need to level this number out here."

An understanding of the economy or economics would be beneficial for anyone who might become a salesman or even represent any kind of business. A Career Management course would be a course that might not be important to someone who just wants to be a technician, but for someone like me, who wants to be a leader in the business---a person who handles the sales and the customers, the books, the numbers, the money---I would say that this would be something more in the area that I do. The technicians---I don't care if they know how to keep track of money. That's not their job. I don't really care if they know how to "crunch numbers" or know how to start their own business, or manage a business because they don't have anything to do with any of that. But, if they aspire to be a shop owner, a shop manager, or even a service writer, these things would be important to know to be able to do the job that I do---to do the job at a higher level like I do---or the owners who do the accounting for the business at home---to keep the books straight.

For technicians, I don't think that the Behavioral Sciences, Social Sciences, Humanities, and Fine Arts areas are nearly as important for their jobs. Although, I can't say that I would completely rule them out because I would want somebody who can understand how it is to be a person who has to deal with other people and deal with (and understand) society the way it is. But, as far as the specifics of History, Government, and Political Science---that doesn't really come into play in their job very often---or even at all. I don't see many times where knowing about U.S. History would help them, or knowing something about politics or political science would really help them. I would say that these areas are probably pretty low on importance.

I would say that the areas of psychology and sociology could be useful. I would say that computer-related courses could definitely benefit a technician because they do use a personal computer. Anytime that a car comes in where they have to diagnose a situation where the "check engine" light is on, they are on the computer. They have to go through the system, they have to get on the Internet and pull up different sites, they have to type in what they need and what they're looking for, and be able to navigate through the different pages of information because you can type in one code for a "check engine" light, and you can come up with 20 pages of information that you may have to read through and test on the vehicle so being able to correlate that to the shop would be extremely important, so I think that computer literacy is important---without a doubt.

Anything under the first-aid category is definitely important. We obviously work in a potentially dangerous environment with a lot of tools, equipment,

fluids, and open flames from torches and welding. So, anything that has to do with first-aid, safety, physical well-being---I would think to definitely be important. If the technicians knew first-aid, and one of them got hurt, another technician could go and help that person, so that would be an important thing. An Introduction to Health & Safety course would be extremely beneficial---considering the environment. I guess that the Lifetime Wellness course could also apply to a technician because they work a lot with their hands and their backs. They're lifting, pulling, and tugging, so I guess that anything that would help them help their physical well-being would be a good idea. In general, anything in the first-aid category looks like it would be something that could benefit a technician.

As far as the area of mathematics is concerned, that does apply to a technician. Numbers are a major thing. I don't think that they have to know calculus or geometry, but a basic understanding of math would be helpful because if they're trying to crunch numbers out there, as in a situation where they're trying to measure the distance between a certain part and another part---and trying to figure out if it's right or not---so I would say that basic mathematics would be a must. In regards to college algebra, I took the course, and I can't think of how it could relate to be directly beneficial to a technician. We do deal with fractions and tape measures, so I suppose that algebra could come into play. If the industrial math course deals with things such as micrometers, that would probably be the most important math course for the technician to take. I don't think that anything requires trigonometry or calculus though. We use ball joint micrometers, which aren't the easiest thing to read and figure out, so if you don't have a good understanding of fractions, you won't really understand how to read these types of micrometers. When I went to Ranken, we spent a whole day working with and reading micrometers. They felt that was something important.

A lot of the fluids that we work with apply to physics---like the physical makeup of the fluids. The question might arise about why automotive coolant isn't good anymore---as in what is preventing the temperature level of the coolant from going down to negative 20 degrees. Although they don't have to have a full understanding of physics, but if they did, it might help them figure out what the problems to the vehicle may have been caused by the coolant being bad. So, the Technical Shop Physics course would seem like it would apply directly to a situation like anti-freeze. It sounds like it is a course that could help the technician in the diagnostic process and could help him explain to the customer why their water pump failed prematurely. He could refer to the coolant and hydrocarbons; so I could see where that could benefit the technician.

- 23.** The automobile repair industry needs people who are literate and proficient in areas like mathematics and computers because that's what the industry needs. Some of the past practices of the education system were to put people in auto shop who were almost illiterate---who couldn't read or do math. (This was detailed in an article titled, "Stop Dumping On Us.")

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I don't see where an American Government or American History class would help an automobile technician.

I do see where anything related to the ASE (Automotive Service Excellence) would be beneficial.

The area of core values and ethical decision making is very broad---so it's hard to say if that would be helpful. Maybe somewhere along the way in a technician's career it would be important, but not initially. Come to think of it, I had a very talented mechanic who after four years, I sent him on his way. He was a very talented mechanic, but he was short on core values and ethical decision-making. He would try to do things where he didn't care if it cost the customer money---as long as it worked out to be beneficial for him. That didn't agree with my ethical values. I got tired of overseeing that situation... I can see where all of these courses would be of benefit to make someone a well-rounded person, but I don't think that they are high priority to the competency of an automobile technician.

I feel that you can overwhelm a technician who is going to college if you make them take a lot of extra courses to the point that they don't have time to learn the main area of what they went to learn---which is automotive technology.

I think that the business courses listed are too broad.

Everyone needs effective communication. I had a technician that I had in my employment for five years. He was one of the hardest working persons you would ever meet, but his reading and writing skills were very low. He managed to keep his job with the attitude of "I will do anything you want me to do as best as I can." However, you couldn't have him go over and plug a diagnostic tool into a car. He was an "old school" mechanic. You have to match the work required to the skills that the technician has.

If you are going to come into this industry as a technician who wants to make a good wage, and if you can't do computers, you are definitely out of the "game." If you can't do computer-related applications, you will always be at the lower end of the pay scale, and you will always be a follower---and never a leader. My experience and knowledge in that area has enabled me to work primarily in the office. That is important since much of the technician's work is physically demanding---and I'm getting too old for that. I have one fellow is working on his situation, but he allowed his education to get behind and his body to get too large, so he had problems working on some auto repair jobs---especially when he needed to do something under the dashboard. So that is where I see where a Lifetime Wellness type of course could help.

In regard to a physics course, there's probably not too many situations where someone can walk out to a car and say, "that class I took in physics is going to help me fix this car." But, that's also like trying to determine when a hammer will pay for itself. I don't know the exact answer to that question, but I know that you can't work without one. In my opinion, physics can be something that can help you figure out a problem that the other guy couldn't figure out. You can apply physics to the speed of a car, the ratio speed of the wheel, and that the drive shaft is turning three times faster than the wheels, so you can

apply the frequency of the noise and determine if the problem is coming from the driveshaft or the wheels.

The use of mathematics can apply to the electrical load of a vehicle. It can also apply to the gear ratio and driveshaft speed. It can help you determine what the gear ratio the differential has. Knowledge of algebra can help you determine a vehicle's gas mileage. I think that calculus and trigonometry is more useful for engineers---rather than technicians. But I think that basic algebra and basic math can make a difference in a technician. It can separate the technicians from the one who has to ask the questions from the one who can answer the questions.

- 24.** I had a technician who had a hard time in the area with human relations. He wasn't a very good people person. The interpersonal communications course could have benefited him.

I can see where these introductory courses in the business areas could help a technician to understand what makes a business successful. If they wanted to become a manager at some point, the Occupational Leadership course would help.

A composition course is a lot about writing, and if you know composition, it can help you understand writing too.

Critical thinking is real important in our business.

Every technician in this business needs to know how to use a computer.

Practically all of the information we use to repair a vehicle comes from computers now. You need to know how to use a computer.

Anything in the area of first aid, health, or safety is important in this business.

I know that in the SWIC auto body program, a lot of the first month of the coursework is dedicated to safety.

Math is important, but not necessarily calculus. A technical math course would be good---especially if it was designed to fit the occupation.

Physics can be more important than math. Again, if the course was structured to involve auto body applications, it could definitely help the technician.

At least a Fundamentals of Chemistry course would be important to the painter to understand the paint products that he is using. It was a real eye-opener to me when I learned the difference between "high solids" and "low solids" paint. A "high solids" paint has larger molecules. It involves the chemical properties of the paint that we use.

- 25.** They need to have common sense of what's required to work in the auto body repair and paint environment.

They need to have an understanding of how to perform the basic mathematical calculations for measuring.

They also need a basic understanding of science to understand chemical reactions in paints and solvents---to understand what is happening and why there are reactions. These are both important factors to be proficient in this job.

In the area of communications, a course in Interpersonal Communications would be the most beneficial. The employees out there in the shop are blue collar guys and they tend to speak what's on their mind, so I think that it would be helpful if they knew the importance of using a little tact in their communication.

I think that an understanding of computer technology would be good for them to be able to understand the functions of the systems on the vehicles. They also need to access the Internet to get information on the repairs needed to some vehicles.

Knowledge of first-aid would be good because you'd want someone to know how to help someone who experienced an accident in the shop.

A common sense course would definitely help---if that would be possible.

- 26.** Communications in general is an excellent skill to have---no matter what part of the business you're in. It can be a benefit when you're dealing with customers or another business situation. Interpersonal communication would be applicable. I don't see where public speaking would be needed though. Computers are definitely a necessity because the technician needs to get information about the vehicles from different manufacturers in order to properly perform the repairs. There are computers inside the cars, and a lot of times the technician has to hook up a laptop directly to the computer in the car to obtain information. So, the technician at least needs basic skills to be able to do that.

Everybody here needs to know first aid---especially when you're dealing with machinery or working with operating parts.

I don't think that you really need college algebra or calculus because I don't see where it would really apply to the shop environment here. I don't see where any of the work that is done here would require college algebra. I do see where a basic math course or a math course that is geared toward the shop work would be helpful---if that's what the vocational-technical math course is. I want to say that a course in core values and ethical decision-making would strongly apply to the shop technician's duties. When they are working on the customers' cars and performing the repairs, the customer is trusting the car when it's in their hands.

It wouldn't hurt to have a little chemistry because the technicians deal with solvents and cleaners so it would be good to have a general knowledge of what they do.

- 27.** After they graduate from the technical school, most of them don't want to go back to school to take other classes. We want them to keep up on ASE certification requirements---so any coursework that would contribute to that would be good.

Knowledge of mathematics would be important, but it depends upon if the shop has a service writer. Then, that person would do the paperwork, so the technician doesn't do any math or addition. It all depends on the individual shop. Math is a good skill to know, and to have knowledge of operating a

calculator, but it won't be something of direct benefit to the automobile technician.

You have to have a certain "knack" to do this job. You have to have the smarts and the intuitiveness to look at the job and say, "This is the wrong, and this is what I need to do."

Computer knowledge is something you have to keep up with all of the time. That's where the evening classes help the technician.

At this shop, the mechanics do sometimes talk to the customer---which is good because they are the ones who worked on the car and are knowledgeable of the car. So, a communications course could help the technician when they would have to talk to the customer---and don't want to sound too forceful.

28. I can see where English courses would be important because they have to be able to read the inspection sheets and write out what they find wrong with the vehicle---and I have to be able to read it. But, I know that I doubted the need for them when I was 18 years old and going to college. Now I understand the importance of courses like this. I know a mechanic who is now going to school to be a nurse because he didn't like turning a wrench. If they take these academic classes, and they either can't, or don't want to turn a wrench anymore, they have these courses as a background they can use for another program degree---so that time won't be wasted. I know that a lot of these guys think that they shouldn't have to take those courses and pay for them. I also like the speech classes. It might be a hard sale for me to explain to a customer what's wrong with their vehicle since I'm the service manager in the office. I have a couple of good mechanics out there who can explain the service they do to a vehicle. Then, I have a couple who can fix almost anything, but they can't explain a darn thing that they're doing. So, if I have those guys (the ones who can't explain what they're doing) on duty, and I have a customer that requires a serious repair to their vehicle, I can explain the repair to the customer in my own terms---but they're not going to believe me as much as they're going to believe the mechanic who is doing the repair on their vehicle. I'd like for them to be able to talk to the customer and tell them, "Hey, this is what's going on with your car."

I noticed the area of mathematics on the list, and I feel that is an area that is very important. These guys have to use the micrometer on brake rotors and they need to know how to add and subtract. Also, on alignments, they need to use the computers that provide them with figures.

Computers are becoming more and more important every day on vehicles. They add computers to vehicles. Our alignment rack operates with a computer. Our emissions machine is done with a computer now. The wheel balancer is computerized. The technicians need to know at least basic math and be able to understand decimals for most of the machinery out there.

A first-aid course could help in case one of these guys get hurt.

The area of physics and science leads into being able to do things on alignments. They have to make sure that the angles are correct. The suspension is all about the geometry of the vehicle, so that course could help.

The newer alignment machines basically tell you everything to do, but they still need to know in their head that if they were given a piece of paper with alignment information on it, they should know what to do.

Basic bookkeeping is important because of all of the stuff we have to do now that involves bookkeeping. The technicians play a part of every ticket that gets written up. They are responsible for making sure that they do a full vehicle inspection. They have to go back through their work and make sure that they sign off on every job they did. So the combination of bookkeeping and organization is very important because they have to keep the paperwork with them at all times. They have to look over the paperwork to see what they have to do on the vehicle, and report what they did.

I don't know how a history course could help the technician work on vehicles. It might help them understand about the past---like when an older vehicle comes in that doesn't have a computer. They have to understand how vehicles used to be put together.

29. The areas of English and communications are very good to know. The technicians often have to communicate with people---in this case, the customers. They need to be able to get their point across.

The area of math is definitely something they need because on a car you're working with angles. You use geometry in the area of front-end alignments. Going back to dealing with customers, I can see where the "Social Behavior" class is good.

I disagree with a history course being a requirement.

Career management, human relations, occupational leadership; I can see where these courses could help the technician.

The importance of computer knowledge in cars is not going away; in fact, it's going to play a bigger role as time goes on. The cars are getting more complicated. There are scanners that you have to plug into cars. You have to be able to read them and understand them. There are scanners that connect to the air bag systems. There are also scanners for emissions that display a code. When it does that, you have to go to a computer and look that code up in the computer. You have to know your way around the computer and how to find things on it. Years ago, you didn't have to have as much computer knowledge, but now, the cars are getting much more sophisticated and complicated. You have to have training and education in the area of computers. The average person won't be able to fix even simple problems on their own cars due to the increasing level of technology on them.

30. The areas of history would be irrelevant. I don't see where we would need anything from them that a history course would contribute to.

There are actually a lot of divisions in our field. Accounting and bookkeeping are areas that I don't think the technician needs knowledge of.

Salesmanship could be a good applicable course because anyone working out there in the shop has the potential ability to talk to the customer.

The study of chemicals and safety equipment would benefit them in this line of work.

Human relations---I can see where that could apply to them communicating. As far as the area of composition, and the English, they really don't have to write much. They write up supplements. They take a car apart and they tell me what is needed on it, and that's pretty much the extent of having to write anything up. I don't even care if they don't spell the words right. The customer doesn't see what they write up. Basically, that's what our job is up here. We are the "go-between" between the customer and the shop. We do all the paperwork. The accounting and the communication all gets done up here. Here in the office area, we are the buffer. It's part of customer service. As far as computers go, there are shops in this business where you need to access industry procedures. So computer knowledge could help in that area. The technician should have the general ability to be able to get around on the computer.

First-aid knowledge is definitely something good to have.

Math is useful. I don't know about calculus, but I think that a general mathematics course would be helpful. I don't think that physics is necessary. In general, I think that courses from all of these areas would be beneficial---except that I can't really see where a history course could help them in any way.

(Note: I had an interview with people from a technical college. They asked us about their program because we've hired people who came from that college. They asked if what they were teaching was beneficial to what we do. I told them that a lot of it wasn't---because we had some of their graduates come in who quit because this was not what they thought it was. The college personnel assumed differently. I told them that it was due to the way the college taught the material. They came here, with a perception of what they thought they were getting themselves into---and the actual shop environment turned out to be very different. That gets into the occupational area---the hands-on kind of stuff.)

31. The thing that stands out to me is Core Values and Ethics---they should all have that.

I think that there is a lot of use for a general understanding of psychology. I don't see much use for history or political science.

A social behavior course could probably contribute to their people skills.

Economics---I can see some benefits since that can apply to the operation of the business.

I don't think that College Orientation would be necessary.

An understanding of business and management would be good.

A communications course would be helpful---so I can see where the Interpersonal Communications course is meant to apply, as well as Oral Communications.

English Composition---I don't see where that is needed. The main thing that is required on the job here is to be able to read.

As I mentioned, computer-related courses are good and useful. I have an older technician here who struggled with that area.

A health and first-aid course could be good to have because the technicians work in an environment that could be dangerous at times.

I think that a basic mathematics course is sufficient for a technician to have.

I can see where a basic physics course would be useful as it applies to vehicle electrical and vacuum systems. In general, I think that it could help them understand how a system works---so they can understand where their starting point is. Maybe the Technical Science course includes some of those things.

32. They need to understand mathematics in order to do a proper diagnosis of the vehicles. They also need to be comfortable understanding math when they use a micrometer on brake rotors. Sometimes, they also deal with pounds and ounces when they service cars. Another item that comes into the work environment is with ohms and resistance---which ties in with math.

They also have to be computer-oriented in order to get information about a vehicle. The company also requires them to take tests that are online. They also like to promote technicians in this company, so as a technician would move up to a management position, there are different skills that are needed that various courses could help them with. Potential managers could benefit from taking courses in the area of communications because they will most certainly have to talk to the customers.

In this company, and other companies like this, those business courses on the list won't help them too much because the companies offer their own different classes throughout the year. A lot of the courses focus on areas like customer satisfaction, customer appreciation, and educating the customer about the things that are associated with their vehicle---like the benefits we can provide them by improving the vehicle's safety and ride with our service.

Communications courses can play a big role in this area.

In the area of business courses, the technicians should realize the importance of maintaining inventory that is needed for servicing vehicles. If you have the items in stock, it can save you time---and that makes the shop run more efficiently. There should be a course that focuses on the importance of inventory management. The efficiency of the technician can contribute to the gross profit of the business.

An important course area for potential managers in this business is human resources management. It costs money to hire a technician. It costs money to do any kind of training with them. Employee retention can save the company money which contributes to the bottom line. Employee turnover is a big expense.

33. It helps to have business-related courses if you have any desire to ever become more than a technician. They can especially be useful for the possibility of running your own shop, and you really should want to know more about how things work with the aspects of business. Business knowledge can help you, depending upon the shop you go to. When I was

working as a technician in a different repair shop, I ran the front area too. I talked to the customers too. That's how I started getting out of the technician role. Now, I'd rather be in the front area of the business talking to the customers. I feel that the more business classes a technician has, the better they are off. It's something that can help them manage their time too---by knowing how to multitask and get things done, you'll be able to be good in this business.

A common sense course would be helpful, but I don't think they teach that in colleges. Common sense can get you a long way in this business. I guess that courses that require critical thinking could contribute to that though.

English and communications are important areas for a lot of technicians. If you can't spell correctly or write correctly, you can't fill out a work order properly. Therefore, there's a communication problem with the person who is going to be writing the ticket up for the customer. At the interview process with a technician, some applicants would want to take the application with them so someone else could fill it out for them. I wouldn't let them do that because they have to know how to fill out a repair ticket because most of them are hand written. If I can't read or understand what a technician wrote down, I have to get up and go ask them to explain it. So, communication is very important in this business. I personally didn't like it when I took it, but think that it's important for the technicians to have to take courses in this area. I can see where an oral communications course could help a technician where they would need to be able to explain a repair job to a customer. It involves taking something that's very technical, and how it works, and putting it into laymen's terms for a normal person to understand. Not to say anything derogatory about women, but men are usually a little more mechanically-inclined. They understand things like how a power steering pump works. It creates pressure, which can sometimes cause leaks. A woman might think along the lines of the power steering pump just naturally springs a leak on her car because it was making noise. They might not understand exactly what occurred that caused the leak. I feel that you should be able to explain to a customer what is wrong with their car if you have to work on it to fix a problem that you have to charge them for---so that they understand what is getting done. The last thing that I think should be in the mind of a customer is not knowing what was done to their car, or remorse for bringing it in here to have it fixed. I think that a customer wants to be informed and educated. Being a technician is hard--it's hard on your body, so if a technician thinks they ever might want to be in management, they will need good communication skills. My technicians often have to interact with customers. Sometimes, we have to ride with the customer in their car to determine what the problem is. It wouldn't help the situation if I rode with them because I'm not the one who will be doing the diagnosing that will eventually lead to knowing what and where the problem is. If the technician is good at communication, he can find out what the problem is with the customer, and also be able to explain it to me so I know about the repair parts and time involved.

In some cases, auto repair shops get a bad reputation because customers think that they're getting "ripped off"---and there are some shop that operate that way. It's important to have a reputation of being a good, honest shop. I believe that in order to have good customer relations, you have to instill a sense of trust and good ethics. At the previous business where I worked, the customers would ask for me---because I treated them in an ethical fashion. After I left, and they got "jerked around" with some of the people who replaced me, and they quit patronizing that business. They wanted someone they could trust.

Although most of the guys out there are pretty good at computers, sometimes they have to come to me. The more familiar a technician is with computers, the better they're going to be. Computers are not going to go away---you're going to need to always know more about them. If you're not interested in them, this is probably the wrong field for you to be in. The days of being able to fix a car with a wrench, socket, ratchet, and screwdriver are over.

I think that a basic math course is all that you need to be a good technician. Calculators, computers, and scanning tools can do most of the math for the technician. Although, there are a lot of ranges and numbers that a technician needs to be familiar with. It would help to have a photographic memory to be in this field. If you take a transmission out, and take it apart, you need to be able to remember where all the parts, nuts, and bolts belong, in order to fix it correctly. Then again, common sense can help out a lot there.

I can see where physics would be helpful because if you put a vehicle up on jacks, and take the transmission out, the balance of it is going to shift. This can be a dangerous job, and the car could fall on you if you don't understand some of the concepts of physics. I know of people who have gotten injured when working on vehicles when an unexpected accident (like it falling on them) occurred.

At the shop where I used to work, I was required to take first-aid training and know CPR. I feel that it's good to have that knowledge in the shop environment.

If you have a "go-getter" attitude, you'll do well in this business.

- 34.** Business courses are super-important. The technicians need to know what it costs to run this business. Also, the technician should be thinking about if they really want to be doing the manual labor on the cars for the rest of their life. They should give themselves chances to move up in a company. These business courses can help in that area. I realize though, that the technician is thinking about the time and money they are investing in courses that don't directly apply to them working on cars. I don't think that car dealers want the technician to talk to the customer. They just want the car in, and out as quickly as possible. Independent shops are different, and I think that is why a lot of people feel more comfortable dealing with them. In respect to the ability to talk to a customer, that's where I see how the Interpersonal Communications course could help a technician out.

The Personal Finance course could help the technician understand things like expenses on a personal basis, and then be able to relate that to how the business functions---but on a larger and different scale.

A psychology course would help technicians understand customers when they have to deal with them---especially problem customers. An example of this is that I have a guy who comes in here who is bipolar. He is the son of a business customer---which is a large account.

35. I don't understand why a technician should have to take any type of history or political science course.

I can absolutely see where a psychology course in the behavioral science area would be helpful because it can help them communicate with the customers. Core values and ethical decision-making is very important in this business. Anything that relates to ASE (Automotive Service Excellence) is definitely important because all of our technicians are ASE certified.

If my technicians were wanting to go into business for themselves, or if I wanted them to be part of the front-end operations, I would consider some of these business courses to be important. I think that a lot of people who go into an automotive technology program might be thinking about eventually owning their own shop. In that case, all of these business courses would be very important. If they were only going to work for some business, then courses in this area wouldn't be that important. If the situation would be where the student is going to have to spend a lot of money taking these types of courses, and doesn't really need them, then I don't think that he should have to take them---unless he was going into business for himself or with a partner.

I think that a technician should be able to spell and write a sentence, and translate their thoughts into a sentence. They should at least take College Composition I, or some form of first-year English, and Career Communications.

The "Writing for Industry" course sounds like it applies to people working in the technical field and could be beneficial.

I don't feel that someone who gets out of a technical college with a certificate, instead of an associate degree, isn't ready to start working on cars. I had a couple of technicians who were previously employed here who exemplified that.

The "Computer Applications for Technicians," or "Computer Literacy" courses sound like they would be awesome and applicable courses for automobile technicians. For the purpose of taking courses online, the "Introduction to Online Learning" course would be good.

In this business, I think that the area of first-aid and lifesaving is very important---as well as the area of lifetime wellness is too.

An applied math or technical math course is needed for technicians. My people out there are probably using math more than I'm aware of. I don't think that calculus or trigonometry is necessary. Business Math wouldn't be

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either unless you were going to be an owner or a partner in this type of business.

I can see where physical science knowledge would come in handy because of the need to see the relationship between something like the outside temperature and the inside temperature when you need to do a proper diagnosis of an air-conditioning system. Air-conditioning may be harder to diagnose in the winter time versus the summer time.

An environmental technology course is a good offering, since we're emissions inspectors, so I can see where that would apply.

Appendix C

Introductory Algebra

9th Edition

Margaret Lial, John Hornsby, Terry McGinnis

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Study Skills: Your Brain Can Learn Mathematics

(This list is the table of contents.)

R. Prealgebra Review

R.1 Fractions

R.2 Decimals and Percents

Study Skills: Using Your Textbook

1. The Real Number System

1.1 Exponents, Order of Operations, and Inequality

Study Skills: Homework: How, Why, When

1.2 Variables, Expressions, and Equations

Study Skills: Taking Lecture Notes

1.3 Real Numbers and the Number Line

Study Skills: Using Study Cards

1.4 Adding Real Numbers

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1.5 Subtracting Real Numbers

1.6 Multiplying and Dividing Real Numbers

Summary Exercises on Operations with Real Numbers

1.7 Properties of Real Numbers

1.8 Simplifying Expressions

Study Skills: Reviewing a Chapter

Summary ~ Review Exercises ~ Test

Study Skills: Preparing for Tests

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2.4 An Introduction to Applications of Linear Equations

2.5 Formulas and Additional Applications from Geometry

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Study Skills: Managing Your Time

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3.2 Graphing Linear Equations in Two Variables

3.3 Slope of a Line

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9.5 Introduction to Functions

Summary ~ Review Exercises ~ Test ~ Cumulative Review Exercises

Appendix A. Strategies for Problem Solving

Appendix B. Factoring Sums and Differences of Cubes

Answers to Selected Exercises

Solutions to Selected Exercises

Appendix D

Tables

Table 2

Educational Institutions

Name	Abbreviation	Location
Crowder College	CC	Neosho, MO
East Central College	ECC	Union, MO
Frontier Community College	FCC	Fairfield, IL
Jefferson College	JEFFCO	Hillsboro, MO
John A. Logan College	JALC	Carterville, IL
Kaskaskia College	KC	Centralia, IL
Lake Land College	LLC	Mattoon, IL
Lewis & Clark Community College	LCCC	Godfrey, IL
Lincoln Land Community College	LLCC	Springfield, IL
Metropolitan Community College	MCCCKC	Kansas City, MO
Mineral Area College	MAC	Park Hills, MO
Ozarks Technical Community College	OTC	Springfield, MO
Parkland College	PC	Champaign, IL
Ranken Technical College	RTC	St. Louis, MO
Rend Lake College	RLC	Ina, IL
St. Louis Community College	STLCC	St. Louis, MO
Shawnee Community College	SCC	Metropolis, IL
Southwestern Illinois College	SWIC	Belleville, IL
State Fair Community College	SFCC	Sedalia, MO

Table 3

General Education Academic Courses – Behavioral Science/Social Science/Humanities/Fine Arts

Name of Course	Educational Institution Requiring
<u>Behavioral/Social Science/ Humanities/Fine Arts</u>	
American Government or U.S. History I or U.S. History II	JALC
American History or American Government or Political Systems - 1 Required	MAC
Automotive Service Excellence Test Review (Psychology of Test Taking)	LLC
Core Values and Ethical Decision Making	KC
General Education Elective – 2 Required	RLC
General Psychology	JALC
History/Political Science Elective – 1 Required	JEFFCO
Humanities or Communications Elective – 1 Required	JEFFCO
Humanities/Fine Arts Elective – 1 Required	LCCC
Introduction to American Politics or State and Local Government	LLCC
Introduction to Psychology or Practical Psychology	SCC
Missouri State Requirement	STLCC
Principles of Sociology or Introduction to Psychology	RTC
Social Science Elective – 1 Required	KC, SWIC
Social Science Electives – 2 Required (1 Must Include Constitution)	OTC
Social/Behavioral Science or Humanities/Fine Arts Electives – 2 Required	PC
Social/Behavioral Science Elective – 1 Required	JEFFCO, LCCC
Sociology	KC
Sociology or Psychology Elective – 1 Required	MAC, STLCC
Strategies for Success or Introduction to Psychology	LLC
U.S. History I or Political Science: National, State, Local Government	CC
U.S. History or American/National Government	SFCC
U.S. History or Political Science or American Politics or State/Local Politics	MCCCK
U.S. History or U.S. Government I: National/State or State/Local Government	ECC

Table 4

General Education Academic Courses – Business/Human Relations

Name of Course	Educational Institution Requiring
<u>Business/Human Relations</u>	
Accounting and Bookkeeping or Salesmanship	PC
American Economy or Principles of Economics I	LLC
Applied Accounting or Introduction to Business Administration	STLCC
Applied Shop Computations (Study of Chemicals, Safety, Equipment, Careers)	LLC
Career Management	ECC
College Orientation	SCC
Foundation Seminar or Foundation Seminar Success Skills (College Transition)	ECC
Human Relations	SWIC
Introduction to Accounting	MCCCKC
Introduction to Business	CC
Introduction to Business and Management	RTC
Introduction to Business or Introduction to Entrepreneurship or Principles of Management	PC
Introduction to College or Mastering the College Experience	JEFFCO
Job Search Success	RTC
Occupational Leadership Development I	MAC
Occupational Leadership Development II	MAC
Preparation for Employment	MAC
Principles of Supervision	MCCCKC

Table 5

General Education Academic Courses - Communications

Name of Course	Educational Institution Requiring
<u>Communications</u>	
Career Communications I or Composition I	LLCC
Career Communications II or Composition II	LLCC
College Composition I/Composition I/ English Composition/English Composition I	ECC, JEFCCO, KC, OTC, PC, RTC, STLCC
College Composition II	RTC
Communications Elective – 1 Required	OTC
Communications or Composition I	FCC
Composition and Reading I	MCCCKC
Composition and Reading II or Technical Writing	MCCCKC
Composition or Advanced Composition or Technical Writing – 2 Required	CC
English Composition I or Professional Technical Writing	JALC
Composition or Public Speaking or Interpersonal Communications or Technical Writing – 2 Required	MAC
English Composition I or Technical Writing	SFCC
First – Year English I (Writing, Critical Thinking)	LCCC
First – Year English II (Writing Improvement)	LCCC
Fundamentals of Speech	CC, KC, MCCCKC
Interpersonal Communication	SCC, SWIC
Interpersonal Communications or Fundamentals of Effective Speaking	FCC
Introduction to Speech Communications/Public Speaking/ Speech	JALC, LLC, LCCC
Introductory Speech or Interpersonal Communication or Composition II	PC
Oral Communication I/Oral Communications	RTC, STLCC
Oral Communications or Public Speaking	ECC
Principles of Effective Speaking	RLC
Rhetoric and Composition I	RLC
Technical Communication I or English Composition	SCC
Technical Communication II	SCC
Technical Writing (Communication Used in Business, Science, and Industry	ECC
Writing for Industry	LLC

Table 6

General Education Academic Courses - Computer-Related

Name of Course	Educational Institution Requiring
<u>Computer Related</u>	
Computer Applications for Technicians	PC
Computer Applications or Business Computer Applications	CC
Computer Literacy (Use of Information Systems)	JEFFCO
Computer Literacy Elective – 1 Required	RTC
Introduction to Computers	JALC
Introduction to Computers or Microcomputer Applications	MAC
Introduction to Online Learning	FCC
Introduction to the PC (Windows)	SWIC
Operating Systems Basics (Windows)	SWIC
Technical Elective – 1 Required	LLC

Table 7

General Education Academic Courses - Health/First Aid

Health/First Aid

First Aid	KC
Health Education or Basic First Aid	RLC
Health or First Aid-Medical Self Help	SWIC
Introduction to Environmental Health and Safety	MCKC
Lifetime Wellness	OTC
Physical Education Activity	ECC, STLCC
Responding to Emergencies	LLC
Wellness Course (Health or Physical Education)	SFCC

Table 8

General Education Academic Courses - Mathematics

Name of Course	Educational Institution Requiring
<u>Mathematics</u>	
Applied Mathematics	PC
Business Mathematics or Technical Mathematics	CC, KC
College Algebra	RTC
College Algebra or Higher Level Mathematics	SWIC
Elementary and Intermediate Algebra – 2 courses or	RTC
Elementary/Intermediate Algebra – 1 course	
Industrial Mathematics	JEFFCO
Introductory Algebra	ECC
Mathematics Elective – 1 Required	OTC, RLC
Mathematics Electives – 2 Required from 1 Discipline	MAC
Mathematics for Business	MCCKC
Mathematics or Natural Science Elective – 1 Required	JEFFCO, KC
Survey of Calculus	RTC
Technical Mathematics/Technical Mathematics I	FCC, JALC, STLCC, SCC, SFCC
Technical Mathematics II	SFCC
Technology – Integrated Mathematics or Technical	LCCC
Mathematics	
Trigonometry	RTC
Vocational – Technical Mathematics	LLCC

Table 9

General Education Academic Courses - Physical Science

Name of Course	Educational Institution Requiring
<u>Physical Science</u>	
Applied Physics or Concepts of Physics	LCCC
Conceptual Physics or College Physics	RTC
Environmental Technology	JALC
Foundations of Physical Science or Introductory Physics	MCCKC
Introduction Life Science or Fundamentals of Chemistry	ECC
Introduction to Physics Laboratory	ECC
Introduction to Physics Lecture	ECC
Principles to Physical Science	OTC, STLCC
Science Elective – 1 Required	OTC, MAC
Technical Physics I or Survey of Physics	FCC
Technical Science	SFCC
Technical Shop Physics	LLCC

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Table 10. Relationship between research questions and interview questions

	Interview Question 1	Interview Question 2	Interview Question 3	Interview Question 4	Interview Question 5
Research Question 1				X	X
Research Question 2	X				X
Research Question 3		X	X		

Vitae

Stephen H. Freund is currently an independent financial advisor affiliated with Nicol Financial Services in Granite City, Illinois. He holds Series 7 and Series 63 securities licenses as well as life and health insurance licenses in the states of Missouri and Illinois. His past automotive-related employment includes experience as a zone manager for the Ford Motor Company at the St. Louis District Sales Office.

Mr. Freund is currently an adjunct business and management instructor at Jefferson College in Hillsboro, Missouri and has also been employed there as an academic advisor. He has also been an adjunct instructor at Southwestern Illinois College in Belleville, Illinois where he taught business, marketing, management, and finance courses. In addition, he served as the faculty advisor for the college's chapter of Phi Beta Lambda, which is a national student business organization.

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