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Mark D. Threeton
The Pennsylvania State University

Richard A. Walter
The Pennsylvania State University

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**The Relationship Between Personality Type And Learning
Style:
A Study Of Automotive Technology Students**

Mark D. Threeton
Richard A. Walter
The Pennsylvania State University

Abstract

In an effort to provide career and technical education (CTE) professionals with additional insight on how to better meet the individual education needs of the learner, this study (a) sought to identify the predominant personality type of postsecondary automotive technology students and (b) examined whether there was a relationship between the participants' predominant personality classifications and learning styles. The findings suggested that the majority of participants had a predominantly Realistic personality classification, and identified a relationship between personality type and learning style. Findings may be useful to CTE teachers and teacher educators interested in diversifying curriculum and instruction via strategies to enhance the educational experience for the student learner.

Mark D. Threeton, is an Assistant Professor of Education in the Learning and Performance Systems Department at The Pennsylvania State University. He can be reached at mdt177@psu.edu. Richard A. Walter, is an Associate Professor of Education in the Learning and Performance Systems Department at The Pennsylvania State University. He can be reached at raw18@psu.edu.

Introduction

Historical Perspectives

Throughout our educational pursuits, many have had a teacher from whom it was difficult to learn. It may have been trouble understanding an educational subject that didn't particularly correspond with one's personality, or it may have been a pedagogy related issue. According to Gardner, (1999) educators tend to teach the way they were taught. Moreover, Jonassen (1981) identified that a strong relationship exists between a teacher's learning style and preferred teaching style. Unfortunately, there is not a "one-size fits all" approach to teaching and or learning (Jorgensen, 2006). Thus, this creates a mismatch that requires attention.

"It is clear that a learning style body of knowledge has been accepted into the education literature and professional development agenda since the 1980s" (Hickcox, 2006, p. 4). A large portion of past research has focused on identifying learning styles, personality types, intelligence and adaptive strategies of teaching to meet the learning needs of students. Learning style research has also provided valuable insight regarding the relationship between personality type and learning style. However, this research does not in most cases specifically align with a CTE setting. For this reason, it may be difficult to fully comprehend the relevance of personality and learning style literature to CTE without highlighting the related research.

Over the years, a majority of studies have examined the relationship between personality and learning via the Myers-Briggs Type Indicator (MBTI). One such study by Fallan (2006) suggested that a student's personality type relates to the most effective form of learning and if ignored can present a conflict in the educational process. Another study conducted by Highhouse and Doverspike (1987) examined the

relationship between measures of cognitive style (i.e., learning style), occupational preference (i.e., personality type) and learning modes of 111 psychology students (48 males and 63 females) at the university level utilizing Kolb's Learning Style Inventory (LSI), the Group Embedded Figures Test (GEFT) and Holland's Vocational Preference Inventory (VPI). With the means, standard deviations, and intercorrelations measured, the results of this study revealed no significant correlations between the LSI and the GEFT. However, there were correlations found between Kolb's LSI and Holland's VPI which parallels the Self-Directed-Search (SDS) instrument. Kolb's Concrete Experience (CE) scale significantly correlated with Holland's Artistic (A) personality type. Kolb's Active Experimentation (AE) scale significantly correlated with Holland's Realistic (R), Social (S), Conventional (C) and Enterprising (E) personality types. Furthermore, Kolb's Reflective Observation (RO) scale significantly negatively correlated with Holland's R, C and E personality types. Finally, Kolb's Abstract Conceptualization (AC) did not correlate with any of Holland's personality types.

A similar study conducted by Penney and Cahill (2002) examined the work personality and learning style of 60 adult male correctional institution parolees on the Avalon Peninsula of Newfoundland utilizing Holland's SDS (Form E), Kolb's LSI and a Career Counseling Preferences Questionnaire (CCPQ). The results revealed: (a) a positive relationship between the LSI and the CCPQ Thinker score; (b) Holland's Investigative (I) personality type was positively correlated with Kolb's AC and AC - CE score; (c) Holland's I personality type was negatively correlated with Kolb's AE score; (d) Holland's A personality type was found to be negatively correlated with Kolb's RO score; and (e) Holland's C personality type was negatively correlated with Kolb's AE and AE - RO score. Penney and Cahill were forthcoming in identifying that "none

of the significant correlations found by Highhouse and Doverspike between the LSI styles and Holland type were replicated in this study” (p. 33).

Another noteworthy study, somewhat related to CTE, conducted by Ritchie (1975) sought to determine if there was a relationship between personality type and the learning style of nursing students and registered nurses via the MBTI and the Media Effectiveness Chart (MEC). The MEC instrument was utilized within this study to correlate preferred instructional media (learning style) with the Jungian personality types. The study findings suggested that there was a relationship between personality and learning and that nursing education programs should be structured to accommodate student development and educational needs. Moreover, Ritchie found that the majority of participants represented within this study were of the Sensing type. Thus, they were identified as needing specific objectives spelled out for learning and evaluation. The results of this study further suggested that the majority of nursing students and registered nurses preferred lecture, discussion, small group work, reading articles, and laboratory work as methods of teaching.

The aforementioned studies have served to highlight the research conducted on the relationship between personality and learning style. While the related literature does not specifically align with a CTE setting, educators within the profession should take this information seriously as comprehending learning style and personality type characteristics has the ability to enhance the educational experience for the learner. There are several themes that can be observed by examining the related personality and learning style literature. First, a relationship between personality and learning style has been identified in select educational settings. Second, the majority of studies, which found a relationship between personality and learning style, used the MBTI. Third, besides the study

conducted by Ritchie (1975) on nursing students and registered nurses, research on the relationship between personality and learning styles in CTE is virtually nonexistent. Thus, research on the relationship between personality and learning style within an educational setting such as the trade and industry sector of CTE could yield valuable data regarding how to better meet the educational needs of students in preparing them for the world-of-work.

Statement of the Problem

According to Gardner (1999), teachers tend to teach the way they were taught. Jonassen (1981) identified that a strong relationship exists between a teacher's learning style and preferred teaching style. These critical findings present a problem that requires attention as we do not all come from the same mold in regard to our specific learning style or personality. Hickcox (2006) suggested that all learning style research and application efforts need to stress the development of the individual and the whole learner. Learning styles, as well as personalities should be accounted for when considering the topic of curriculum development and instruction. With the overload of curricular assessment demands, and a vast amount of learning style models, educators may find themselves in a state of confusion regarding the use of learning style models in the classroom (Hickcox, 2006). This phenomenon creates a problem that requires attention.

While several studies have examined the relationship between learning style and personality type, few have examined the trade and industry sector of CTE. Thus, this study sought to determine whether a relationship exists between the personality type and learning style of postsecondary automotive technology students. This topic was examined for the purpose of providing more information

regarding how to better serve the educational needs in preparing this student population for the world-of-work. Thus, this study sought to answer the following questions:

1. What is the predominant personality type of postsecondary automotive technology students?
2. Is there a relationship between the postsecondary automotive technology student predominant personality type and their learning style?

Theoretical Framework

The theoretical framework that was used for this research study included Holland's Theory of Vocational Personalities and Environment and Kolb's Experiential Learning Theory (ELT). While most closely associated with the career development domain of education, John Holland's Theory of Vocational Personalities and Environments is one of the most popular and effective career development models to date. Holland's Theory (1997) explained that personalities and occupational environments can be classified into six different categories (Realistic (R), Investigative (I), Artistic (A), Social (S), Enterprising (E), and Conventional (C)) thus, individuals search for an environment in which to express their interest, abilities and values (see Figure 1).

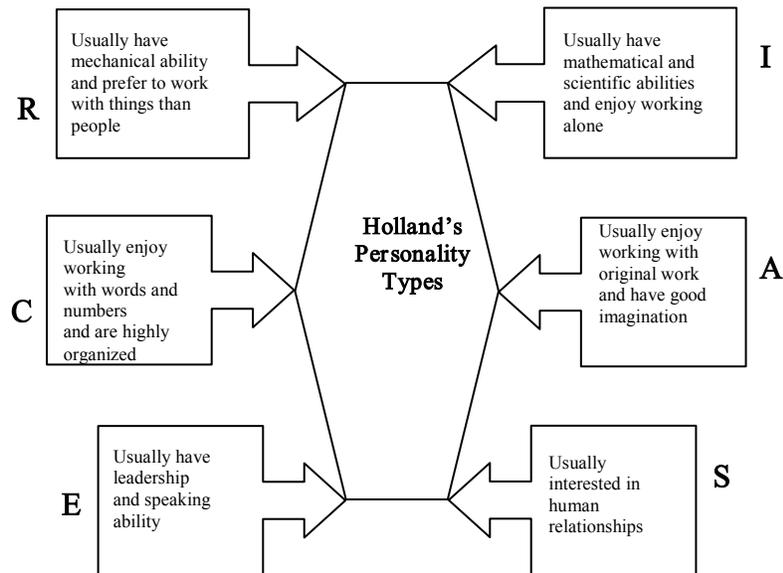


Figure 1. Holland's six personality classifications (1997)

Holland identified that people, in most cases, cannot be classified as a pure type but rather are a combination of two or three. Holland's Theory naturally aligned with this study as the research examined both an occupational area (i.e., automotive technology) and personality type. One of the most popular instruments used to identify an individual's personality and environmental type based on Holland's Theory is the Self-Directed-Search (SDS). The SDS is a self-administered, scored and interpreted educational assessment tool, which attempts to identify a three-letter code in order to determine the personality and environmental type which best represents interests, abilities and values of the individual (Holland, 1971).

The second theory that served as a foundation for this

research study was Kolb's ELT (1984). Kolb's ELT (2005b) identified two dialectically related modes of grasping experience: Concrete Experience (CE) and Abstract Conceptualization (AC) and two dialectically modes of transforming experience: Reflective Observation (RO), Active Experimentation (AE). Thus, based on the preferences for one of the polar opposites of each of the aforementioned modes appears four learning styles including: Converging, Diverging, Assimilating and Accommodating (Evans, Forney & Guido-Dibrito, 1998) (see Figure 2). Kolb's ELT naturally aligns with this study as the research focused on the learning style of postsecondary automotive technology students. Kolb's ETL uses an instrument known as the Learning Style Inventory (LSI) to assess individual learning style. The LSI is set up in a simple format, which usually provides an interesting self-examination, and discussion that identifies valuable information regarding the individual's approaches to learning (Kolb & Kolb, 2005b).

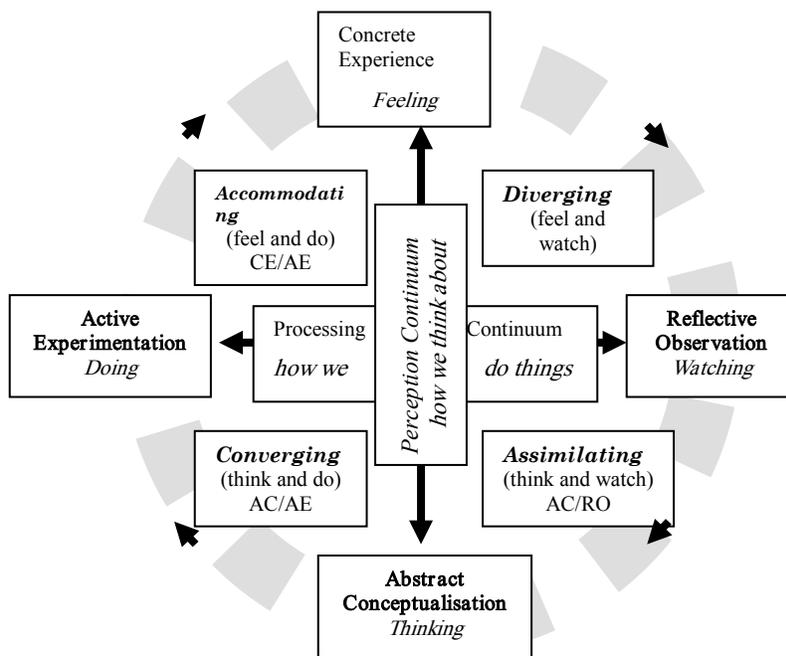


Figure 2. Kolb's learning styles (Chapman, 2006)

Methods

Target Population

Since there is a lack of research on the relationship between personality and learning style in CTE, the study examined this topic through the lens of the trade and industry sector of the profession. The target population for this study was postsecondary automotive technology students in the central region of Pennsylvania. Postsecondary automotive technology students eligible to participate in the study were defined as: (a) first or second year students currently enrolled in a postsecondary automotive technology program in central

Pennsylvania providing career preparation in the automotive technology field (i.e., general certificate programs, associate of applied science degree programs, and automotive manufacturer GM Asset programs); (b) students currently learning to repair automobiles, trucks, buses, and other vehicle repairs on virtually any part or system through a combination of classroom instruction and hands-on experience; and (c) currently enrolled students are at least 18 years of age or older.

During the data collection phase of this study, there were three public postsecondary colleges with automotive technology programs in the central region of Pennsylvania. According these institutions' registrar offices, during the spring semester 2008, there were a total of 310 postsecondary automotive technology students in central Pennsylvania. Thus, a minimum sample size of 172 was required for the study to represent the population with no more than a 5% margin of error with 95% confidence (Isaac & Michael, 1997). In order to obtain an acceptable sample size, postsecondary automotive technology students completed surveys administered by the primary investigator in the participants' classroom setting.

Instrumentation

A quantitative research methodology was used to conduct the study. The specific method chosen to investigate the research questions was a series of three paper form questionnaires. The first questionnaire was a participant background information survey, containing a series of questions relating to: gender, age, career plan, automotive work experience, secondary auto-tech course completion and program satisfaction. The remaining two questionnaires included the Self-Directed-Search (SDS) and Learning Style Inventory (LSI).

Validity and reliability for SDS

The SDS is available in several versions by age as well as for youth and adults (Holland, Powell & Fritzsche, 1994). This study utilized the adult Form R, 4th edition of the SDS since the sample is drawn from a population of adult postsecondary automotive technology students. Based on a sample of college males and females, Holland et al. (1994) identified the internal consistency reliabilities of the SDS as ranging from .90 to .93. Evans, Forney and Guido-Dibrito (1998) pointed out the test-retest reliabilities ranged from .76 to .89 over a four to twelve-week period for high school, college and adult respondents. According to Rayman and Atanasoff (1999), the SDS has well documented empirical validity. In fact, the SDS instrument is offered in several different languages and has reported similar results in different countries (Holland & Gottfredson, 1992). Concurrent validity is measured by “hits” that “equals the percentage of a sample whose high point code and one-letter aspirational or occupational code agree” (Holland, Fritzsche & Powell, 1997, p. 14). Average interest inventories have validity hit rates ranging from 40 to 55%. However, the most recent version of the SDS was found to be at the high end of this range (54.7%) (Holland et al. 1997).

With instrument validity concerns, and since the SDS is predominantly used for linking personality to career choice, the primary investigator sent Dr. John L. Holland a copy of the proposed research study along with a letter requesting his professional input. Dr. Holland responded with a personal phone call. When asked whether it appeared unwise to use the SDS as the personality instrument in this research study Dr. John L. Holland stated:

I've never seen any version of the SDS used for this purpose. However, given that your study is dealing with aspects of both personality and occupational

environment in automotive it seems very appropriate to use the SDS for this study. I have no reservations about my instrument being used for this purpose. I would however suggest using the Form R version since your participants are college students. In the past I saw a similar study on the relationship between personality and learning style. I think it used the MBTI as the personality assessment. The results suggested there was a relationship, but the correlation was very weak if I recall. I'll be interested to see the results of a similar study, which uses the SDS rather than the MBTI. (personal communication, November 28, 2007).

While the SDS has typically been used in linking personality to career choice, the six different personality and environmental types highlight specific characteristics, with the ability to identify the personality type of the adult postsecondary automotive technology students within this study.

Validity and reliability for LSI

Kolb's ELT uses a self-administered, scored and interpreted educational assessment instrument, the Learning Style Inventory (LSI), to assess individual learning style, which was utilized in the study (3.1 Version). Smith and Kolb (1986) identified the reliability Cronbach alpha coefficients of the LSI as ranging from .73 to .88. Watson and Bruckner (Evens et al., 1998) found the reliability Cronbach alpha coefficients of the LSI ranged from .76 to .85. While the LSI appears to be a reliable assessment tool yielding internally consistent scores, Kolb (1976) has suggested the best measure of his instrument is not reliability but rather construct validity. As an example, Ferrell (1983) conducted a factor-analytic comparison of four learning style instruments and determined a match was present between the factors and learning style on the original LSI contributing to construct validity. Furthermore, Evans et al.

(1998) noted construct and concurrent validity of the LSI have received several endorsements.

Data Collection

The data collection phase of this research study was conducted during the spring of 2008 at the three public postsecondary institutions in central Pennsylvania offering automotive technology as a program of study. The appropriate clearance was obtained from the Pennsylvania State University Office for Research Protections regarding the inclusion of human subjects in this research study. Access was also granted by the automotive technology faculty members at the participating institutions. These faculty members selected specific automotive technology classes to participate in this study for a total of 189 potential research participants. Faculty allotted 90 minutes of in-class time for data collection.

Beginning in January of 2008, thirteen face-to-face data collection sessions were conducted with automotive technology students at the three institutions. After a brief introduction and explanation of the research purpose, students were invited to participate in the study. The students were informed that participation was voluntary and their identity would be kept confidential. A signed informed consent form was obtained from each participating adult postsecondary automotive technology student prior to completing the survey instruments. First, the participants were instructed to complete the general background information survey. Second, students were asked to complete the SDS (Form R 4th Edition) instrument. Third, students were asked to complete the LSI (3.1 Version) instrument. Fourth, and finally, participants were extended a thank you and the primary investigator collected the survey packets from each student.

Rate of Return

The face-to-face data collection sessions yielded 188 participants/instruments (i.e., 99% response rate) or approximately 60% of the total population. However, twelve survey packets were removed from the study due to incomplete information. Thus the total count of usable instruments within this study was 176 or 56.7% of the target population. The usable response rate from the sample of 189 subjects was 93%.

Background of Participants

Demographic data were collected from participants via a background information survey asking six questions regarding gender, age, career plan, automotive work experience, secondary auto-tech course completion status and current program satisfaction. Table 1 summarizes the demographic data collected from the background information survey.

Table 1
Demographic Data of Participants (n=176)

	<i>n</i>	%
Gender		
Male	173	98
Female	3	2
Age of Participants		
18-20 yrs.	141	80
21-23 yrs.	24	14
24-26 yrs.	4	2
27-30 yrs.	2	1
31-45 yrs.	5	3
Plan to Pursue a Career in Auto-Tech		
Yes	166	94
No	10	6
Years of Auto-Tech Work Experience Since Age 16		
None	31	18
< 1 yrs.	43	24
1-5 yrs.	98	56
6-10 yrs.	2	1
11-15 yrs.	0	0
16 or > yrs.	2	1
Completed an Auto-Tech Course in High School		
Yes	55	31
No	121	69
Overall Satisfaction with Current Auto-Tech Program		
Very Satisfied	90	51
Moderately Satisfied	82	47
Low Satisfaction	4	2
No Satisfaction	0	0

Findings

Analysis of Data

In an effort to provide career and technical education (CTE) professionals with additional insight on how to better meet the individual educational needs of postsecondary

automotive technology students, this study focused on first identifying the predominant personality type of postsecondary automotive technology students and second examined whether there was a relationship between their predominant personality type and learning style.

This study first sought to determine the predominant personality type of the subjects. The first research question was answered by calculating the frequencies and percentages of the personality data collected from the completed SDS instruments. The personality type with the highest frequency and percentage was identified as predominant. Second, the study sought to identify whether there was a relationship between the respondent's personality and learning style. To answer the second research question, participants first completed the LSI to identify their learning style. Question two was specifically answered by examining the completed SDS and LSI data through a Chi-square analysis of association. Finally, the background information was analyzed by calculating the frequencies and percentages of the data collected from the background information survey. The data were analyzed using the Statistical Package for the Social Sciences (SPSS v16, 2008).

Research Question 1

What was the predominant personality type of postsecondary automotive technology students? The first research question was answered by calculating the frequencies and percentages of the personality type data collected via the SDS instrument. After calculating the results of the SDS, it was determined that the Realistic personality type was the predominant classification of 148 (84.1%) participants within this study (see Table 2).

Table 2
Distribution of Participant Personality Types (n = 176)

Personality Type	<i>n</i>	%
Realistic	148	84.1
Investigative	3	1.7
Artistic	6	3.4
Social	3	1.7
Enterprising	14	8
Conventional	2	1.1
Total	176	100

Note. (a) Realistic types usually have mechanical and athletic ability, (b) Investigative types usually have mathematical and scientific ability, (c) Artistic types usually enjoy creating original work, (d) Social types usually have strong social skills and enjoy working with people, (e) Enterprising types usually have leadership and speaking skills, (f) Conventional types usually enjoy working with words and numbers (Holland, 1997).

Personality Type and Learning Style Relationship

Research Question 2

The second research question sought to identify whether there was a relationship between the postsecondary automotive technology student's predominant personality type and learning style. To answer this question, participants first completed the LSI to identify their learning style. The results of the LSI were much more equally distributed than the personality classifications of the SDS. The Accommodating style was most highly represented (39.8%) while the Assimilating was the least (16.5%) suggesting that the sample of postsecondary automotive technology students was a diverse group of learners (see Table 3).

Table 3
Distribution of Participant Learning Styles (n = 176)

Learning Style	<i>n</i>	%
Accommodating	70	39.8
Diverging	37	21
Converging	40	22.7
Assimilating	29	16.5
Total	176	100

Note. (a) Accommodating people have the ability to learn primarily from hands-on experience, (b) Diverging people are best at viewing concrete situations from diverse points of view, (c) Converging people are best at finding practical uses for ideas and theories, and (d) Assimilating people are best at understanding information and putting it into logical form (Kolb & Kolb, 2005b).

Research question two was addressed by a 4x2 crosstabulation analysis conducted using the four learning styles with Realistic classification and an “all other type” personality category. The “all other type” personality category consisted of the five remaining personality types. This 4x2 Chi square analysis was conducted to correct for expected frequency cell counts of less than 5 exceeding the 20% criterion (Utts & Heckard, 2002, p. 460) observed within the learning style and personality distribution. The results of the 4x2 Chi square analysis revealed no statistically significant association between the personality types and learning styles. However, the basic descriptive statistics related to the distribution of learning style and personalities are still valid (see Table 4). This 4x2 Chi-square analysis revealed one cell (12.5%) with expected counts less than 5, which is within the acceptable range of less than 20% (Utts & Heckard, 2002, p. 460).

Table 4
Crosstabulation of Learning Style by Personality Type (n = 176)

Learning Style	Personality Type	
	Realistic	All Other Types
Accommodating	56 (31.8%)	14 (7.9%)
Diverging	30 (17%)	7 (4%)
Converging	36 (20.5%)	4 (2.3%)
Assimilating	26 (14.8%)	3 (1.7%)
Total	148 (84.1%)	28 (15.9%)

$\chi^2(3, N=176)=2.84, p < .417$.

Note. 1 cell (12.5%) has expected counts less than 5. The minimum expected count is 4.61.

Since the results displayed within Table 4 revealed no statistically significant association, a 4x1 Chi-square analysis was conducted between the four learning styles and the predominant Realistic personality type. The results of the second Chi-square analysis revealed that there was a statistically significant relationship between the predominant Realistic personality type and the Accommodating learning style of 56 participants (37.8%) (see Table 5). Holm's sequential bonferroni post-hoc (1979) method was used to control for type 1 error at $p < .05$ across all comparisons.

Table 5
Crosstabulation of Learning Style by Realistic Personality Type (n = 148)

Learning Style	Realistic Personality Type	
	<i>n</i>	%
Accommodating	56	37.8 _a
Diverging	30	20.3 _b
Converging	36	24.3 _b
Assimilating	26	17.6 _b
Total	148	100

$\chi^2(3, N=148)=14.38, p < .002.$

Note. Percentages with no subscript in common differ at $p < .05$ using Holm's sequential bonferroni post hoc comparisons.

Conclusions and Discussion

The majority of the postsecondary automotive technology students who participated in this study had a predominant Realistic personality type resembling the O-Net (2007) classification. While disproportionate, the personality distributions did represent all six categories of Holland's classifications. Thus, the answer to the first research question is, Realistic is the predominant personality type of postsecondary automotive technology students (see Table 2).

The results of the Learning Style Inventory (LSI) were much more equally distributed than the personality classifications of the SDS. The Accommodating style was most highly represented (39.8%) while the Assimilating was the least (16.5%) suggesting that the sample of postsecondary automotive technology students was a diverse group of learners. Care should be taken by postsecondary automotive technology faculty within central Pennsylvania to differentiate instructional techniques to align with all four learning styles as past research has shown that educators tend to teach the way they were taught (Gardner, 1999) and the sample of

postsecondary automotive technology students was identified as a diverse group of learners. While past research studies have examined the relationship between personality type and learning style, few have focused on the trade and industry sector of CTE. Contributing to the void of research in this area, the calculated results of the Chi-square analysis (i.e., Table 5) within the study revealed a statistically significant relationship between the Realistic personality type and the Accommodating learning style ($p=.002$) of 56 participants or 31.8% of the overall sample of postsecondary automotive technology students. Thus, the answer to the second research question was: yes, there was a relationship between the postsecondary automotive technology student predominant personality type and their learning style. However, the relationship between personality and learning style was not observed outside of the 31.8% of participants with both a Realistic personality type and Accommodating learning style classification.

It is difficult to compare the results of this study to past personality and learning style correlation studies as they utilized different instrumentation such as the Myers - Briggs Type Indicator (MBTI) and Kolb's LSI (i.e., the modes of grasping experience dimension). However, the results of this study indirectly resemble past research on this topic in that a relationship was found between personality type and learning style. The results further identified a very unique sample of Realistic and Accommodating participants who had the ability to learn primarily from hands-on experience, would rather work with things than people and had an aversion to academic and therapeutic activities (Holland, 1997; Kolb & Kolb, 2005b) (see Figure 3).

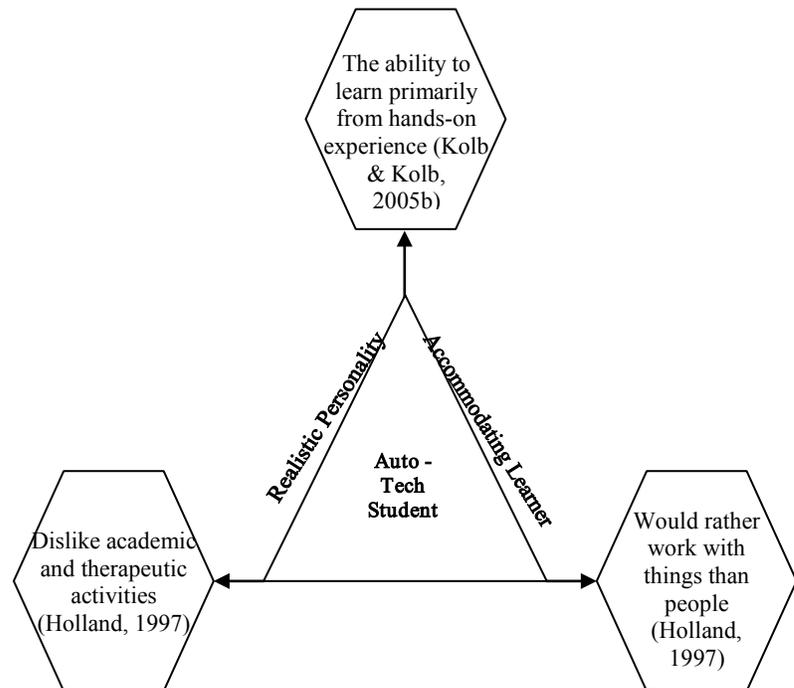


Figure 3. Characteristics of postsecondary automotive technology with an association between Realistic and Accommodating classifications.

Given the findings displayed within Figure 3, the educational specialization of automotive technology appears to be a natural fit. However, with these characteristics come some challenges within the automotive technology profession. For example, an automotive technician is expected to perform preventative maintenance and repairs on a daily basis within the automotive industry. If they would rather work with things than people, they may have a difficult time communicating effectively with a customer while attempting to pinpoint a vehicle drivability problem. Moreover, if they have an

aversion to academic activities, they may find it difficult to write a handwritten description of a completed vehicle repair for billing purposes, put forth the effort to read a technical service bulletin (TSB), or calculate their completed flat rate hours to protect themselves from employer fraud.

These examples highlight standard operating procedures within the automotive technology field, which may conflict with the characteristics of 31.8% of participants. The Realistic and Accommodating learners will not, in most cases, search for opportunities to develop/learn these skill sets without assistance. Therefore, postsecondary automotive technology faculty within central Pennsylvania should supply these students with hands-on experience in occupational specific reading, writing and verbal communication (i.e., TSB reading, writing repair descriptions on work orders and customer communication role plays) including specific training on calculating and documenting completed flat rate hours.

Given that the sample of participants statistically represents the population with 95% confidence at the $p < .05$ level, and since all four learning styles were collectively represented by the sample, postsecondary automotive technology faculty within central Pennsylvania should guard against disproportionately teaching to one learning style over another. A process of “adopting and adapting” instructional techniques and strategies for all learning styles seem more appropriate. This is particularly important since past research has shown that educators tend to teach the way they were taught (Gardner, 1999), and the sample of postsecondary automotive technology students was identified as a diverse group of learners. A process of adopting and adapting instructional techniques and strategies for all learning styles has the ability to enhance the educational experience for the student learners.

This process of adopting and adapting instructional

techniques and activities can vary greatly depending on the area of educational specialization. Sample auto-tech activities are shown for each of Kolb's learning styles in Figure 4 to assist automotive technology faculty. A process of adopting and adapting instructional lesson plans to align with the sample activities/strategies may enhance the educational experience of all four types of learners within the automotive technology program (see Figure 4).

<u>Accommodating</u>	<u>Diverging</u>
Open-ended vehicle problems	Class discussions
Student presentations	Group lab projects
Hands-on repair simulations	Field trips
<u>Converging</u>	<u>Assimilating</u>
Vehicle computer simulations	Lectures/Presentations
Individual lab assignments	Repair manual reading
Field trips	Repair demonstrations

Figure 4. Sample activities of Kolb's learning styles for auto-tech faculty.

A cautionary note regarding the personality and learning style results of this study: there are no right or wrong classifications and everyone uses each learning style and personality type to some degree. While the results do represent the population with no more than a 5% margin of error with 95% confidence, the findings of this study are limited in a sense because: (a) they are not generalizable outside of the target population; and (b) the instrumentation format was self-reporting in nature and could have been incorrectly reported by

participants. Thus the results should be viewed as a tool to assist in better understanding the population of postsecondary automotive technology students in central Pennsylvania. The results of the LSI and the SDS identified the strength of preference not the degree of personality and learning style use. Therefore, type biases and or negative stereotyping of this student population as a result of the findings within this study should be avoided at all costs.

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