AN ANALYSIS OF TECHNICAL COLLEGE STUDENT MOTIVATION TO PURSUE A

HIGHER GRADE IN CORE ACADEMIC CLASSES

by

Jeffrey Charles Hoffman

Liberty University

A Dissertation Presented in Partial Fulfillment

Of the Requirements for the Degree

Doctor of Education

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APPROVED BY:

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ABSTRACT

The purpose of this predictive correlational study was to investigate the motivation of students seeking a vocation in the technical college setting. The study used Vroom's expectancy theory as it relates to students' beliefs in their ability to attain a higher grade (expectancy) and their desire for that grade (valence) to the effect on student academic effort (motivational force). The study's participants were selected from degree seeking students at a technical college in the Middle Georgia area. For the correlational element of the study, Hierarchical Multiple Regressions models were used and a statistically significant correlation was found, $p < 0.05$, thus supporting the use of the expectancy theory as an effective model for predicting student motivation resulting in a mean adjusted $R^2 = .66$. Further analysis from this data found that the predictors −valence and expectancy- can predict effort levels of motivation in the technical college degree student with near identical ($p = .942$) squared semi-partial correlation coefficients of .325 and.324 respectively. This correlational design, employing a within-persons decision-modeling research approach is an attempt to fill the gap in the research in the area of student motivation as it relates to technical college students, whose academics are designed for the sole purpose of preparing the student for employment in areas as diverse as accounting and welding.

 Keywords: expectancy, valence, effort, motivation

Dedication

This dissertation is dedicated to my wife, Jeni. If it hadn't been for her encouragement, I never would have finished. I love you!

To my children: Adrien and Sarah, Natasha and Keith, Amber, and Matt!

To my grandchildren: Adrien (17), Brian (15), Hayden (3), and Silas (.056).

To my Mom, who once told me, "Jeffrey, not everyone is cut out for college."

To my Dad, who calls me his "favorite son" when I'm his only son, and he asks me how I'm coming on finishing this dissertation every time I talk to him.

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List of Abbreviations

Grade Point Average (GPA)

Hierarchical Multiple Regression (HMR)

National Assessment of Career and Technical Education (NACTE)

Technical College Student Motivation Survey (TCSMS)

Valence-Instrumentality-Expectancy (VIE)

CHAPTER ONE: INTRODUCTION

The National Assessment of Career and Technical Education (NACTE) report of 2013 indicated that community and technical colleges for vocational education are viewed as the place to attend to receive the knowledge and skills required for employment. The individual enrolling in a community or technical college chooses a certain program of study, which that individual finds appealing, based on a plethora of reasons ranging from monetary rewards to simple interest in the subject matter (Marcus, 2013). Knowing or hearing of students who have graduated from a certain program of study and found employment in high salary positions, may encourage enrollment in such programs by those who desire the same outcome.

Technical or vocational education is considered to be the *modus operandi* for the student population with the desire to reach goals, which require specific technical knowledge and skills. This study will investigate the motivation of students seeking a vocation in the technical college setting. In this study, the phrase *technical education* is synonymous with *vocational education* as seen in an academic setting of a technical college where core courses such as college algebra and college-level English are part of the required program of study along with specific skill sets. It is important to note the distinction between *technical education* as a set of competencies gained to perform a task related to work or a job and *technical education* as seen through the lens of the technical college community offering college degrees with core academic classes comparable to the liberal arts and Board of Regents colleges. In that context and in this study, college algebra or an English composition class is considered technical education or vocational education. Throughout this study the terms *vocational* and *technical* are used interchangeably with regards to education and the adult learner.

Background

The purpose of this study was to examine Vroom's expectancy theory relating to a students' belief in the possibility in achieving a higher grade (expectancy) and the desire for that grade (valence) with the effect on student academic effort (motivational force) among degree students at a technical college in the Middle Georgia area. Students in this study were enrolled in one of five degree divisions: (a) Aerospace, Trade, and Industry, (b) Business and Computer Technologies, (c) Health Sciences, (d) Public Safety and Professional Services, and (e) Technical Studies at the technical college. The motivation levels of this student population in a growing economy is very important as vocational programs are becoming more collaborative with degree studies traditionally the providence of the two-year and four-year academic colleges. Student motivation studies historically have focused on college and university students and found that achievement goals and motivation were tied together (Campbell, Baronina, & Reider, 2003; Geiger & Cooper, 1996; Geiger et al., 1998; Harrell, Caldwell, & Doty, 1985).

The problem, however, is that very little literature exists on student motivation in vocational training in the technical college system, and what literature does exist points to a lack of motivation (Hsieh, Hwang, & Liu, 2003; Liao & Wang, 2008; Su, 2005; Wu, 2005). This left a gap in the literature relating to a large population of students enrolled in technical colleges in the United States.

Therefore, this study looked at motivation by examining the relationship between vocational students' learning and performance goals and their valence toward those goals. This analysis used the constructs of Vroom's (1995) expectancy theory to evaluate the relationship between valence toward various outcomes and the expectancy of success (Colquitt, LePine, & Noe, 2000; Gyurko, 2011; Havari & Skjesol Bagoein, 2011; Kusurkar, Ten Cate, Van Asperen,

& Croiset, 2011) of technical college students.

Expectancy Defined

A nursing student or a welding student enrolled in a technical college is seldom absolutely certain that he or she will complete the program of study. With every choice that an individual makes, there are associated risks that people know will affect whether or not they will be able to attain their desired goal. How much a person believes that they can or will achieve that which they want in the face of risk is *expectancy* (Lewin & Cartwright, 1951; Tolmon, 1932; Vroom, 1995). Expectancy can be measured on a scale of zero to one, with zero indicating no certainty of attaining an outcome and one being an absolute level of certainty. Said another way, the greater the subjective certainty, the greater the strength of expectancy; therefore, expectancy is the action-outcome component of motivation. It is the individual's belief that by performing action *x* it will result in outcome *y* (Lewin & Cartwright, 1951; Tolmon, 1932; Vroom, 1995). Vroom (1995) contrasts *instrumentality* with expectancy as an outcome-outcome relationship. For example, an A in a course (outcome) will increase GPA (grade point average) (outcome), whereas expectancy has an action-outcome relationship to motivation.

This study addressed the issue of adult student motivation in technical education using Vroom's expectancy theory and its predictive capabilities in explaining valence and academic force based on various outcomes in the learning process. For the purpose of this study, each factor in the valence and force models was used for the analysis of technical college motivation toward the three most common motivators in research on postsecondary education: (a) higher GPA, (b) increased technical knowledge, and (c) self-satisfaction (Abd-El-Fattah, 2011; Geiger & Cooper, 1996; Geiger et al., 1998; Harrell & Stahl, 1983; Harrell et al., 1985; Hayamizu & Weiner, 1991; Stahl & Harrell, 1983).

Valence Defined

This study replicated Harrell and Stahl (1985), Harrell et al. (1985), Geiger and Cooper (1996) and Geiger et al. (1998). These studies that were replicated found that valence, or attractiveness, toward outcomes motivated the individual more than the expectancy of achieving the outcome. In other words, a student's motivation to get a higher grade is more strongly impacted by the desire for the higher grade than the belief that the higher grade is attainable.

Kurt Lewin (Lewin & Cartwright, 1951) described valence as the positive or negative emotion attached to an event. More specific to this study, students wanting a good grade in a class could be motivated having a *positive valence* to that outcome if they simply love to make good grades. At the same time, another student could have a *negative valence* fearing the consequence of not attaining that grade. Either way, individuals have a valence toward goals (Nilson, 2010; Svinicki, 2004). Thus, students enrolled in a vocational program at a technical college would be expected to display high levels of motivation toward their calling in their academics, each one having his or her own reasons, goals, or desired outcomes for being in school. This study looked at the motivation levels of students based on their *valence* toward three academic goals: higher GPA, knowledge for a job after college, and self-satisfaction.

Motivation Defined

Central to this study are the concepts of human motivation in relation to a vocation with training and education as the conduit for the successful achievement of that end. Conyers (2004) defines *vocation* as the work in which an individual is employed, a term derived from the Latin word *vocatio,* which means, "to call." Put another way, a vocation is more than a job; it is a calling, which affects motivation. From the context of the field of education, Nilson (2010) speaks to the issue of motivation as stimulating a desire to learn the material or subject matter.

This stimulation is normally associated with intrinsic motivation as it deals with the student's own wants, needs, and desires to learn. Extrinsic motivation is that which seeks external rewards, incentives, or recognition by others (Kanar, 2011). It is the desires and wants that are different to each individual that present a challenge to the instructor or administrator who wants to provide effective instruction in a technical college or vocational program.

Motivation is also defined as a force that keeps an individual acting, moving, and doing things (Salma & Sajid, 2012) or, as Harmer (1983, p. 98) described it, ". . . some kind of internal drive which pushes someone to do things in order to accomplish something." Vroom (1964) defined motivation as a stimulus associated with drives or incentives that not only bring an individual to act but also to provide direction for that action. Vroom (1995), building on the research of Lewin (Lewin & Cartwright, 1951) and Tolmon (1932), added that the direction of action (motivational force) was based on the relationship between an individual's desire (valence) for a certain outcome or goal or set of goals and the perceived attainability (expectancy) of that goal. In other words, Vroom would see a student's motivation to work hard in a course as the product of his or her desire for a goal such as a higher GPA and the belief that he or she can actually attain that GPA.

This researcher acknowledges that in practice, whether in the classroom or in administration, the educator in technical education does not think in terms of valence and expectancy. Technical college educators want to find out what will motivate their students. They can then link coursework to relevant goals or outcomes that students want (valence) and help students to believe that they can actually attain their goals (expectancy), such as getting an A in a course, that results in selection for an internship or cooperative agreement with business, industry, or a local military establishment. These are the terms used in the analysis section of

this study; therefore, motivation is seen as a product of two factors: valence and expectancy (Vroom, 1995).

Motivation in Technical Education

Knowles (1984) described adult learner motivation factors as the European concept of *andragogy,* which posits that each learner possesses a level of *self-direction, past experience, timing*, and *need to know* toward the learning experience as part of adult learning theory. This paradigm of andragogy is consistent with current research findings in studies exploring self-determination theory (Deci, Ryan & Guay, 2013). Based on that concept, the motivation associated with vocational students is to acquire a trade or technical knowledge to perform and fulfill their drives and desires toward a particular end. Students with the desire to be nurses, electronics technicians, or welders will be motivated not just to enroll but to persist in the course of training with the perceived end fulfillment in sight if they believe that the vocational or technical program will get them where they want to be and meet the needs in their lives (Abadi, Jalilvand, Sharif, Salimi, & Khanzadeh, 2011; Farmer, 2011). Vroom (1995) as well as contemporaries Alderfer (1972), Maslow (1970), McClelland (1953), and Herzberg (1959) developed theoretical frameworks based on the concept that needs are central to motivational theories.

Expectancy theory (Rubenson, 1977; Vroom, 1995) is a theoretical framework that differs from other cognitive process theories of motivation in that it does not focus on what motivates the individual. Instead, it focuses on the relationship between the students' want for something and the belief that it is attainable, as two cognitive variables, and the effort or work that individuals choose to put forth toward their goals or desired outcomes (Lunenburg, 2011; Vroom, 1995). The issue, then, is whether technical college students believe their effort will

accomplish whatever immediate goal they might have and to what degree they feel it is attainable. What educators in postsecondary technical and vocational education can do, by viewing student motivation through the lens of expectancy theory, is develop policies and implement methods that support factors in the learning experience that promote positive expectations and realistic goals, and ultimately have a positive impact on the success of those learners.

Svinicki (2004) offers to educators four key points for understanding goal-directed motivation in these students. First, motivation gives the learner a focus in the learning process, and, second, it gives direction to the focus. Third, motivation brings persistence in the face of barriers along the path to learning through volition (Jadidian & Duffy, 2012; Pintrich & Schunk, 1996). The fourth point describes goals as the motivator toward certain perceived "benchmarks" (p.142). Through application of motivation in vocational learning activities from these four views, the educator is better able to affect levels of expectancy and valence toward learning goals.

Vroom's Expectancy Theory in Technical Education

Vroom (1995), in expectancy theory, describes the three elements that affect the level of effort toward goals. The first is expectancy, where a student might say, "If I try hard, I can make a good grade in my class." In the second, instrumentality, a student might say "If I get a good grade, it will it help me get a better GPA." The third element is valence where that same student says, "How much do I really value a higher GPA?" It is important to note that these elements are sometimes multiplicative and at other times additive in relationship, depending on the individual; meaning that if any factor, rated zero to one, were to go to the level of zero, then effort would also to go to zero. This is illustrated in Table 1.

Table 1

Examples of the Relationship between the Elements of Expectancy Theory to Effort

Expectancy	X	Instrumentality	x	Valence	=	Effort
1	X	1	x	1	=	100% Effort
1	X	1	x	.9	=	90% Effort
1	X	.9	x	.9	=	81% Effort
1	X	.9	x	.2	=	18% Effort
0	X	1	x	1	=	0% Effort

Note. Table adapted from www.slideshare.net/alohalarsen/expectancy-theory

Lunenburg (2011) described expectancy theory of motivation as a mental process whereby the individual believes that there is a relationship between his or her effort put forth toward desired goals, the successful performance based on the effort, and the rewards gained from the effort-performance relationship. Important to the analysis process of this study in arriving at conclusions with regard to technical college student motivation and effort is simply taking into consideration whether an additive process is used or the multiplicative form. The use of Vroom's model of expectancy in looking at student motivation requires acknowledging these two concepts as mentioned in prior research (Geiger & Cooper, 1996; Geiger et al., 1998; Harrell & Stahl, 1983; Harrell et al., 1985; Stahl & Harrell, 1981). This study replicated the analysis methods of two of those articles: (1) Stahl and Harrell (1981) and (2) Geiger and Cooper (1996).

Two of these factors – valence and expectancy – and their relationship to student motivational effort were analyzed in this study to provide to educators in the vocational and technical colleges research on student motivation toward academic success through emphasis on goals and the attainability of those goals (Svinicki, 2004).

Lunenburg (2011) describes this cognitive process of expectancy theory as based on the following four assumptions: (a) An individual's expectations about his or her own needs, motivations and personal history with regards to an organization have the greatest influence on how that individual will react to the organization; (b) The individual has personal choice and the perpetuity of the exercise of choice; (c) All individuals do not necessarily want the same things or desired outcomes; and (d) Individuals will make that choice, within themselves, that best suits them.

A technical college educator may view this process from a practical application standpoint seeing students entering the institution as motivated by certain outcomes that they perceive they can attain through a given vocational program. For example, a student who just enrolled in an electronics technology program at the local technical college may be in a prerequisite college algebra class, a course teaching skills, which are required for one to function effectively in the field of electronics. The question is what motivates that student to make an A in that course. Is it a higher grade point average, a better level of knowledge for a job after college, or a higher level of self-satisfaction? Does the student believe he or she can make the high grade, or are there physiological, psychological, or emotional factors that work as barriers to student learning? Does the student believe he/she has the ability to achieve a higher grade but sees no reason to do so? To what degree does the student question whether making an A will be instrumental in achieving the ultimate goal?

From the lens of expectancy theory, the student's belief that he or she can make the high grade and the relationship to physiological, psychological, or emotional factors that work as barriers to student learning are part of the expectancy of success of the individual. Expectancy theory also allows the researcher to test the relationship between expectancy and valence

regarding a goal. An example is all students who believe that they have the ability to achieve a higher grade yet see no reason to do so (Lunenburg, 2011; Svinicki, 2004). If outcomes of a technical college program do not match what the individual wants, then the student's motivation will be affected. Motivating vocational students depends strongly on their understanding as to what degree they believe whether making a higher grade in a course will be instrumental in their achieving their ultimate goal (Lunenburg, 2011).

Svinicki (2004) reviewed the literature on motivating students in postsecondary education and found that the theoretical frameworks of motivation describing the adult learner in this context fall into three psychological viewpoints: (a) drive theory that deals with balance within an individual's thoughts and behaviors, (b) behaviorism where learning comes from reinforcements and punishment, such as grades, or (c) cognitive theory that focuses on how learners interpret their own situations. From these three viewpoints, Svinicki (2004) amalgamated student motivation theory into two functions of "learner's goal orientation" (p.147): the value of the goal and the expectancy that the goal is achievable. Accordingly, value is based on the attractiveness to the goal (Pintrich & Schunk, 1996) and influenced by the perceived needs, utility and intrinsic qualities of the goal, social influences, and the amount of choice and control (p.146). Expectancy of the achievability of the goal, according to Svinicki (2004), is affected by the past experiences of the individual, self-efficacy, attitudes, personal attributes, beliefs about learning, perceived difficulty of attainment of the goal, the skills of the student, and social support from the community (p. 146).

Svinicki's (2004) descriptions of the influences on the desire for goals and expectancy of success are congruent with the more recent research findings using motivation theory in corporate training, medical schools (seen as a vocational field), postsecondary education, adult

continuing education, tenured-faculty productivity, and physical education (Abadi et al., 2011; Abd-El-Fattah, 2011; Daehlen & Ure, 2009; Estes & Polnick, 2012; Gegenfurtner, Fesner, & Gruber, 2009; Halvari & Skjesol Bagoein, 2011; Kusurkar et al., 2011).

Much research has been conducted with university students, faculty, and staff, as well as extensive studies on business and employee motivation, using Vroom's expectancy theory as a reliable theoretical framework in predicting success (Geiger & Cooper, 1996; Geiger et al., 1998; Harrell & Stahl, 1983; Harrell et al., 1985; Stahl & Harrell, 1983). This study will use Vroom's (1995) expectancy theory to explain any changes in technical college degree students' motivation toward desired outcomes or goals; all of which are enrolled in one of the following technical college degree divisions: (a) Aerospace, Trade and Industry, (b) Business and Computer Technologies, (c) Health Sciences, (d) Public Safety and Professional Services, and (e) Technical Studies. Students in these programs have various perceived goals with regards to what that getting a higher grade in a core class will get them. Outcomes in expectancy theory are objects or conditions that an individual finds an aversion to or attractiveness toward to a certain degree (Vroom, 1995). This study was modeled after a series of studies that looked at student motivation of university students in relation to a higher GPA, increased technical knowledge, and increased feelings of self-satisfaction (Geiger & Cooper, 1996; Geiger et al., 1998; Harrell & Stahl, 1983; Harrell et al., 1985; Hayamizu & Weiner, 1991; Stahl & Harrell, 1983).

Furthermore, this study sought not to use the valence model of expectancy theory which includes the factor of instrumentality as part of motivation in predicting the attractiveness of a higher grade in the instruction process based on varying outcomes in the survey instrument; however, the force model was used for hypothesis testing to predict academic effort, given those same conditions (Harrell et al., 1985; Snead & Harrell, 1991; Stahl & Harrell, 1983).

This research study attempted to fill the gap in the research on student motivation as it relates to technical college students whose academics are designed for the sole purpose of preparing the student for employment.

Technical college education serves a unique role in the life of the adult learner. Most students attending technical schools are doing so for the purpose and expectation of a better employment status or condition in life (Daehlen & Ure, 2009). The attraction to goals, the belief that doing work will result in a desired end, and the belief that a specific program or course will help meet that end are paramount to the decision to attend vocational and technical education programs since the adult learner sees employment as the outcome. Vroom (1995) believed that valence (attraction to something) and expectancy (belief that work will result in a desired end) are two key components that create the motivation that will bring participation and persistence to academic pursuits (Rubenson, 1977; Vroom, 1995).

Current literature indicates that employment is the primary factor in adult motivation in technical education (Colquitt et al., 2000). Research also shows that in such fields as nursing and allied health programs, the desire to get a job was the primary motivator, and other altruistic outcomes were secondary (Macaskill & Taylor, 2010; Stromberg & Nilsson, 2010). However, such factors as helping people, providing for those in need, and caring for the hurting are not seen as motivators in the fields of aerospace, trade and industry, business, and computer technologies. These findings emphasize goals and the pursuit of them as paramount to academic programs leading to employment, making expectancy theory the lens of choice in seeking to understand motivational differences between or across technical education programs. Though goals such as getting a good paying job or helping others may be an ultimate goal for enrolling in a program of study (Marcus, 2013), little if any research speaks to the issue of what motivates

technical college students to work toward a higher grade in a class. In other words, a radiologic technology student studying for an English 1101 exam is not likely motivated by his/her desire to help hurting people after his or her schooling as much as they are by the desire for a higher GPA, satisfaction of getting a good grade, or increasing knowledge as a radiologic tech student.

This study presented technical education as the context and background for testing the use of Vroom's expectancy theory in explaining student motivation. An overview of valence, instrumentality, and expectancy (VIE) theory, as framed by Victor Vroom (1995), is presented to provide a greater general understanding of the theoretical framework in the following narrative. Also provided are the problem and purpose statements along with the significance of the study, research questions, and the specific hypotheses framing the locus of the study. An identification of the variables, definitions of terms relevant to the constructs of expectancy theory, and a research summary conclude the chapter.

Problem Statement

Technical college administration, faculty, and staff are always looking for ways to better motivate adult learners in applied academic programs. Svinicki (2004) stated that the expectancy-value model (Wigfield & Eccles, 2000), in its various forms, is one of the three most prominent motivation theories, along with the goal orientation model (Dweck & Leggett, 1988) and the social cognitive model (Bandura, 1986), used today in examining college student motivation toward academic success. Recent studies using goal-oriented and expectancy-value models have examined transfer of training (Gegenfurtner et al., 2009), medical training (seen as a vocational area) (Kusurkar et al., 2011), in-service training (Abadi et al, 2011), student feedback (Caulfield, 2007), low-skilled students in continuing education (Daehlen & Ore, 2009), and tenured-faculty productivity (Estes & Polnick, 2012).

Over the past two decades, several studies have used expectancy theory, and more specifically Vroom's models, to assess student motivation in university accounting education (Geiger & Cooper, 1996; Geiger et al., 1998; Harrell & Stahl, 1983; Harrell et al., 1985; Stahl & Harrell, 1983). These studies also look at which of the components of motivation, through the lens of expectancy theory, valence or expectancy, has the greatest effect on effort levels. Most studies have found the valence toward goals is the greater factor in student motivation than expectancy (Geiger & Cooper, 1996; Geiger et al., 1998; Harrell & Stahl, 1983; Harrell et al., 1985; Stahl & Harrell, 1983).

The problem, however, is that very little literature exists on student motivation in technical training in the technical college system with regards to the common goal of getting a higher grade in core academic classes. Literature exists pointing to a lack of motivation, laziness, and poor performance in technical and vocational training courses in ESL (English as a Second Language) (Hsieh et al., 2003; Liao & Wang, 2008; Su, 2005; Wu, 2005). What is lacking in the reviewed literature is any review of the motivation in students receiving training received from an institution, such as a technical college, that adds a unique dimension of academic courses combined in a training experience where specific skills are the aim. Plenty of research exists with regards to training that have been explored on skills training (Gegenfurtner et al., 2009; Kursurkar et al., 2011). This leaves a clear gap in the literature relating to the large population of students enrolled in technical colleges where core academic courses are require for technical training program completion.

This study looked at motivation by examining the relationship between vocational students' learning and performance goals and their valence toward those goals. This analysis used the constructs of Vroom's (1995) expectancy theory to evaluate the relationship between

valence toward various outcomes and the expectancy of success of the technical college student (Colquitt et al., 2000; Gyurko, 2011; Halvari & Skjesol Bagoein, 2011; Kusaurkar et al., 2011).

Purpose Statement

The purpose of this predictive correlational study was to examine the motivation of technical college students to perform well and make an effort toward academic success as evident in pursuit of a higher grade in their core classes. Particular attention was paid to the student's belief that a higher grade can be achieved (expectancy), the desire for that grade (valence), and the effect of these factors on student academic effort (motivational force). This study sought to understand better how the relationship between the motivational factors – expectancy and valence –related to student performance and perception of success in the classroom.

Significance of the Study

The significance of the study was that it adds to the theoretical and empirical foundation of research with regards to adult learners in technical education and, more specifically, those in technical colleges. This study will serves to provide to instructors and administrators in the technical colleges an explanation of student motivation within the context of the technical college experience. It used the force model of expectancy theory to describe technical education student motivation in a technical college environment and will help fill the gap in the literature as to valence-instrumentality-expectancy (VIE) theory's ability to predict valence and academic effort toward higher grades in core academic classes in the technical college. The study also extends the research of Geiger et al. (1998) and Campbell et al. (2003) by giving instructors' practical and useful motivators for their students. For example, pointing out to students that a higher grade can not only lead to a greater GPA, but also increase their knowledge to do a job

after college and at the same time increase the student's self-satisfaction. As well, the finding of the study can significantly contribute to policies and processes by which a clear path to a successful end is made in the classroom so that no ambiguity exists to whether the student knows the steps to take in order to increase one's own grade.

Research Questions

This study focuses on three research questions designed to investigate the motivation of students in vocational degree seeking programs. The first research question (RQ#1) and subsequent hypothesis looked at the linear correlation with student effort levels based on the combined attraction toward goals as provided in valence scores and the expectancy scores of attaining those goals. The scores used are reported by the participants in the survey. The second research question (RQ#2), addressed whether the variable valence was a greater contributor to effort than expectancy and the third research question (RQ#3), looking at whether expectancy was a greater contributor to effort the criterion variable. This research study answered the following research questions (RQ):

RQ#1 – Is there a relationship between a student's belief that a higher grade can be achieved (expectancy score) combined with the desire for that grade (valence score) to a student's academic effort (effort score) to attain that grade?

RQ#2 – Does a student's desire for a higher grade (valence) have a greater contribution to motivational effort than expectancy?

Hypotheses and Analysis Method

H_01: There is no statistically significant correlation between a student's belief that a higher grade can be achieved (expectancy score) combined with the desire for that grade (valence score) to a student's academic effort (effort score) to attain that grade.

Following the research methods of used in previous studies using Vroom's expectancy theory in explaining student motivation (Geiger & Cooper, 1996; Geiger et al., 1998; Harrell & Stahl, 1985); A hierarchical multiple regression (HMR) was conducted using SPSS at two levels for the analysis of this hypothesis. This method allowed for analysis of both additive (level 1) and multiplicative (level 2) processes to indicate whether the multiplicative process, as originally described by Victor Vroom (1964) was used in the relationship between valence and expectancy toward effort in the classroom or the more parsimonious additive approach.

H$_0$2 – A student's desire for a higher grade (valence) does not have a greater contribution to motivational effort than expectancy.

Using regression data from Block 1 or Block 2 (which ever has the greater F statistic) of the HMR models from H$_0$1 the predictors– expectancy and valence – the squared semi-partial correlation coefficients were used to analyze the specific contribution to of each predictor to the effort level of the student for hypothesis testing (Cohen, 1992; Rovai, Baker, & Ponton, 2013).

Additionally a paired samples t-test was performed on the squared semi partial correlation coefficients Block 1 of the $N = 61$ significant regression models, to compare the mean values of the squared semi partial correlation coefficients for the variables of Valence vs. Expectancy. Results were tested for statistical significance, $p < .05$, to see if the mean difference between the two sets of squared semi partial correlation coefficients was different from zero.

This study following the design and methods of Geiger and Cooper (1996) used a predictive correlational design to explore whether there is a significant correlation and uses the hierarchical regression to simply look at whether an additive or multiplicative process is used by the individual in reporting their effort levels in this survey. That data provided what was then needed to analyze for a correlation between valence and expectancy on student effort levels of

motivation and the squared semi-partial correlation coefficients were then used to see if the predictor variables would individually predict effort levels of motivation.

The standard alpha level of 0.05 or 95% confidence interval commonly used in education research was used when testing significance of each individual's responses in this study this study. As well the standard convention for statistical power of 0.8 or 80% was also used in this study (Cohen, 1992; Gall, Gall, & Borg, 2007; Howell, 2011; Rovai et al., 2013) and a larger sample size (>*N*=50) was sought (Green, 1991). A more detailed explanation of sample size calculation, using previous research studies, is discussed further in the Methods chapter of this study.

Identification of Variables

The first research question (RQ #1) looked at the relationship (linear correlation) of expectancy and valence as predictor variables to academic effort serving as criterion variable in a sample of technical college students. The second research question looked at whether valence (RQ#2) or expectancy could have a greater contribution to the effort levels of technical college student's motivation to attain a higher grade in core academic classes by using squared semi-partial correlation coefficients.

Definitions

Motivation – From the theoretical frameworks of Vroom's expectancy theory which is rooted the cognitive process research of Lewin (Lewin & Cartwright, 1951) and Tolman (1936), motivation is defined as the product of a student's *expectancy* that his or her effort will result in favorable performance, the *instrumentality* of that performance getting a desired result, and attractiveness of that result to the student, also known as *valence* (Vroom, 1964).

Valence – The desire or attraction toward or aversion from an outcome or combination of

outcomes (Vroom, 1995).

Expectancy – The belief that a certain act will result a desired outcome. Expectancy is an action-outcome association (Vroom, 1995).

Additive Process – In decision making toward motivational effort if a report of a level of zero for valence or expectancy is made a motivation level other than zero is possible (Geiger & Cooper, 1996; Geiger et al., 1998).

Multiplicative Process – In decision making toward motivational effort if a report of a level of zero for valence or expectancy then from a strict multiplicative assumption the motivation level would have to be zero as well (Geiger & Cooper, 1996; Geiger et al., 1998).

Effort or Motivational Force – The effort level of an individual to act toward a desired outcome (Vroom, 1995).

Higher Grade – The highest grade that a student desired as an outcome for a course. In technical education, not all students necessarily want an A in a class; some just want to pass, as core academic courses are prerequisite for entering into the individual's desired vocational program of study.

CHAPTER TWO: REVIEW OF THE LITERATURE

Introduction

This review of the literature provides a theoretical basis on adult student motivation and the foundational frameworks surrounding a learner's desire to act and move toward success in the vocational setting. Various definitions of *motivation,* from the context of educational psychology and applications to the practitioner, are explored as they pertain to the motivating of adult students. A review of the current use of theoretical frameworks of work motivation is presented as it applies to adult learners in a technical college or vocational learning environment seeking to achieve success in the classroom and pursue desired goals.

This review of the literature also provides an up-to-date review of valence, instrumentality, and expectancy (VIE) theory as framed by Victor Vroom (1995) with regards to adult learners in technical education. This research replicated Geiger and Cooper's (1996) study of accounting students and their motivation to attain a higher grade in an accounting course. This prior research explored student varying beliefs about certain outcomes, such as the attractiveness of getting a higher GPA, better level of knowledge for a job after college, and feelings of self-satisfaction (Geiger & Cooper, 1996; Geiger et al., 1998; Harrell & Stahl, 1983; Harrell et al., 1985; Stahl & Harrell, 1983).

Theoretical Framework

Motivation Defined

Motivation is often viewed qualitatively, as a teacher might say that the student is "not very motivated" or is "really trying." Within this context of an educational setting, the work needed for the adult learner to succeed in the classroom was the focus of the literature on motivation. Nilson (2010) defined motivation as "stimulating the desire to learn something" (p.

51). Kanar (2011) points out that the *motive* for learning is "the reason, purpose, incentive for behavior" (p. 38); whereas, the *motivation* for learning is "the impulse to act on your incentives and desires" (p. 38).

Vroom (1964) defined *motivation* as a stimulus associated with drives or incentives that "*motivate*" an individual to act. Nilson (2010) speaks to the issue of motivation, in the educational context, as stimulating a desire to learn the material or subject matter. This stimulation is normally associated with *intrinsic* motivation as it deals with the student's own wants, needs, and desires to learn. Kusurkar et al. (2011) further develop the nature of intrinsic motivation stating that it is the motivation that makes an individual go after and persist toward that educational program that is interesting and brings enjoyment, making it "the most autonomous/self-determined form of motivation" (p. e243). Dalton, Hoyle, and Watts (2010) add *emotion* to their definition, stating that motivation is "the emotional stimulus that causes us to act. The stimulus may be a need or a drive that energizes certain behaviors" (p.56). Kanar (2011) includes, in the discussion on motivation, e*xtrinsic* motivation as that which one is motivated toward external rewards, incentives, or recognition by others. As a converse to intrinsic motivation Kusurkar et al. (2011) describe extrinsic motivation as a force making the individual pursue the educational process toward attaining external outcomes to gain compensation and reward or to avoid the negative outcomes external to one's self.

Kusurkar et al. (2011) reported that extrinsic motivation is composed of four levels of self-determinant regulation: (a) *external,* (b) *introjected,* (c) *identified,* and (d) *integrated.* The motivation of the individual that is due to what others think about the learner's activity in the education process apart from any interest of the subject matter is what the researchers termed *External regulation. Introjected regulation* provides the motive to learn when the individual

realizes the importance of the educational activity, yet perceives the motivation as external. *Identified regulation*, however, occurs when the learner identifies with the program of study and accepts the motivational direction from that identification. Finally, *integrated regulation* occurs when the individual integrates the program of study and when it "has been fully integrated into the individual's coherent sense of self; the locus of control is not internal" (Kusurkar, 2011, p. e243). The common assessment of the findings on the importance of academic motivation in practitioner research is that the direction of the motivation is toward a goal, and a desire to attain that goal drives the process, resulting in learning just as in work motivation theory (Cross, 1981; Dalton, Lauff, Henke, Alt, & Li, 2013; Driscoll, 2000; Kanar, 2011; Kursurkar et al., 2011; Merriam & Cafferella, 1999; Nilson, 2010; Owens &Valesky, 2011; Vroom, 1995).

Vroom (1995) begins his discussion on the nature of motivation by pointing out that there are two fundamental questions one must answer when understanding motivation. The first question centers on arousal of an organism or the question of what energizes the organism to act. It asks, "Why is the organism active at all?" (p. 9). The second question involves the direction of the action and the choices, asking, "What form will that activity take?"(p. 9). Answering the latter question is more important to most psychologists in looking at motivation as it deals with choices among various alternatives and factors as a large part of learning theory (Vroom, 1995). Expectancy theory (Rubenson, 1977; Vroom, 1995) is the theoretical framework that differs from other cognitive process theories of motivation in that it does not focus on what motivates the individual, but focuses on the beliefs and relationship between the cognitive variables and the effort or work put forth toward goals or desired outcomes as congruent between those relationships (Lunenburg, 2011). For the purpose of this study, *student motivation* was viewed as the product of a student's *expectancy* that his or her effort will result in favorable

performance, the *instrumentality* (the belief that one outcome, such as a higher grade in a course, will result in another desired outcome or how instrumental one outcome is to achieving another outcome) of that performance getting a desired result, and attractiveness of that result to the student, also known as *valence* (Vroom, 1964).

Introduction to Vroom's Expectancy Theory

This theory of motivation, from which Rubenson's paradigm of recruitment was drawn and one to which Courtney (1992) would classify as decision models, examines motivation from the perspective of why people choose to follow a particular course of action. Vroom (1964) introduces three variables, which he calls valence, expectancy and instrumentality. Valence is the importance that the individual places upon the expected outcome of a situation. Expectancy is the belief that output from the individual and the success of the situation are linked with an action-outcome association. Instrumentality, however, is the belief that the success of the situation is linked to the expected outcome of the situation with an outcome-outcome association. The utility of this theory applies to any situation where someone does something because they expect a certain outcome. An example of this utility could be understanding a literacy learner participating in ABE courses for the purpose of bettering his/her life as in the actors in Fingeret and Drennon (1997) study. The literacy learner persists in the lessons and literacy experiences because they think it's important to read and write therefore they go to class (valence); they think that the more effort they put into reading and writing experiences with the tutor will result in a better ability to read and write (expectancy); and the more courses and lessons or experiences that they complete then less time they will have struggling with reading and writing outside the program (instrumentality).

Vroom's theory of motivation is about the associations people make towards expected

outcomes and the contribution they feel they can make towards those outcomes. A strength of this model would be that for many people action does not lead to desired result in their lives, so it is critical for any theory to take this into account; a point that Courtney (1992) makes with reference to traditional models not taking into account the social context factors of society.

The Historicotheoretical Approach to Vroom's Expectancy Theory

It was from the theories of Lewin (Lewin & Cartwright, 1951) and Tolman (1932) that Vroom began to consider using cognitive theory to look at how and why adults made decisions about vocational interest and motivation to stay at a certain job or change to another. Vroom (1964) cites the research on vocational interest of Cowdery (1926), Fryer (1931), Kitson (1930), Kruder (1946), and Strong (1929) as foundational to the development of expectancy-valence theory with regards to employee persistence and occupation selection as a study within the field of occupational psychology (Vroom, 1964). He looked at the psychological factors being evaluated with Elton Mayo's human relations movement combined with Lewin's (Lewin & Cartwright, 1951) work on group dynamics and how they played out in the Hawthorne experiment (Roethlisberger & Dickson, 1939) and the Harwood Manufacturing Company (Coch & French, 1948) as they focused on the influence of the environment on worker behaviors.

According to Vroom (1964), it was the research and work of Viteles (1953), Maier (1955), Roe (1956), Super (1957) all of which were contributing to the then newly developing field of industrial, occupational or career psychology dealing with issues of motivation toward a vocation that led to the development of his understanding of expectancy-valence theory. The key elements of this research field looked at need, motive, goal, incentive, and attitude. Out of this body of research, Vroom defined motivation as a process of governing choices made by persons among alternative forms of voluntary activities.

Formative Learning Theory Development

Vroom (1964) attributes the psychological basis for his development of expectancy-valence theory starting with the hedonist doctrine that people act and decide toward certain outcomes in an attempt to maximizing certain outcomes perceived as rewards, satisfiers or positive reinforcers as opposed to an attempt at minimizing other outcomes that are perceived as punishing, dissatisfiers, or negative reinforces came two schools of thought about learning: historical learning and cognitive theories.

Historical learning asserts lawful relations between the behavior of organisms at one point in time and previous events. This is the basis of research of Thorndike's (1911) law of effect, Hull's (1943, 1951) principle of reinforcement and following research associated with "drives" which Allport (1954) investigated as products of consequences of past choices. Vroom referred to this psychological approach as "strongly behavioristic" (p.12) and less applicable to the adults that make cognitive choice. It was however, the works of Tolman (1932 and Lewin (Lewin & Cartwright, 1951) on motivation theory in their cognitive theories the contributed the most to the development of Vroom's (1964) expectancy theory assuming that organisms have beliefs, opinions, and expectations. Lewin (Lewin & Cartwright, 1951) distinguished the primary difference between the historical and ahistorical explanations to behavior leading to Vroom's adaptation of Lewin's (Lewin & Cartwright, 1951) work in formulating his understanding of the role of VIE in theory development in understanding and predicting human behavior (Vroom, 1964).

Motivation in Vocational and Technical Education

A review of the latest literature on motivating the vocational and technical education student, looked at the relationship of the student's motivation based on desired outcomes and

found that student motivation is directly influenced by job-related motives to participate and persist (Houle, 1961; Kusurkar et al., 2011; Liao & Wang, 2008; Merriam & Cafferella, 1999; Pintrich & Schunk, 1996; Shin & Lee, 2011). Therefore, vocational and technical students have their own reasons for being in school and what they want to achieve from enrolling in and completing a program of study in a technical field. Though there is no doubt that students are motivated to attend and enroll in vocational programs, current literature finds that as recently as mid-2008 students enrolled in technical education often lack motivation (Hsieh et al., 2003; Liao & Wang, 2008, Su, 2005; Wu, 2005). The population sample for these studies was ESL students in Asian countries learning the English for better chances of employment. Their findings generalized vocational students as "lazy" (Liao & Wang, 2008, p. 1) and "slow to learn" (Liao & Wang, 2008, p. 1), a generalization that prompted this research on students in the technical college system in the United States.

Houle (1961) found, through interviews with his students, that adult learner motivation can be categorized into three orientations: (a) activity-oriented – where students participate for the joy of the activity; (b) learning-oriented – the students participate for the joy of learning; and (c) goal-oriented – the learners participate in anticipation of achieving a certain goal. Past research had looked at several goals for which students would apply themselves in a particular course of study. The most common goals are higher grade point average, greater level of technical knowledge in the field of study, and issues of self-satisfaction (Geiger & Cooper, 1996; Geiger et al., 1998; Harrell & Stahl, 1983; Harrell et al., 1985; Hayamizu & Weiner, 1991; Kusurkar et al., 2011; Murayama & Elliot, 2009; Stahl & Harrell, 1983).

Shin and Lee (2011) add that Bandura's (1986) concepts of self-efficacy also play a heavy role of motivation in the vocational education setting as part of the evaluation of personal

and environmental characteristics of motivation and its role in expectancy theory. They note that these constructs of motivation departed from the more traditional view of human behavior that people are inherently motivated or unmotivated (Shin & Lee, 2011). Building on Vroom's (1964) model of expectancy, Lawler (1973) developed expectancy into two components: (1) expectancy from the relationship of effort to performance, and (2) the expectancy from the relationship of performance to outcome (Shin & Lee, 2011). Vroom's (1995) original models of expectancy theory were further used in researching motivation in accounting education (Campbell et al., 2003; Harrell et al., 1985; Geiger & Cooper, 1996; Geiger et al., 1998). This research confirmed the accuracy of Vroom's expectancy theory in predicting student success based on varying desired outcomes and perceived expectancy of success, as a viable model for examining the same constructs with participants in vocational coursework.

Practitioners in the field of vocational and technical education value the characteristics of motivation in the adult learner, because this factor affects outcome of student success; Nilson (2010) states, "learning is an 'inside job,' motivating students is our primary job" (p. 54). Sass (1989) studied motivation by asking students what motivated them to learn. He reported the following eight critical factors as key to their motivation: (a) instructor enthusiasm toward the course and material; (b) greater level of relevance of the material to real life; (c) organization of the coursework; (d) appropriate levels of difficulty of the subject matter; (e) students' active involvement in learning activities; (f) using various instructional methods; (g) good rapport with the students; and, (h) using the appropriate examples. Hobson (2002) found the most powerful motivators to be (a) the positive attitude and behaviors of the instructor, (b) a cohesive course design, (c) prior interest in the material, (d) course content relevant to the student, and (e) performance measures appropriate to the student's desired outcomes.

Nilson (2010), in her review of the literature of postsecondary teaching and curriculum design, concludes that the motivation theories credible for anchoring curricular strategies that best motivate students are *behaviorism, goal orientation, relative value of the goal*, and *expectancy theory*. *Behaviorist theory* looks at two types of *reinforcers*, the positive type where a student seeks a reward for a behavior or the negative type where the student is motivated by avoiding an undesired outcome (Pintrich & Schunk, 1996). For the educator, *punishment* associated with behaviors in the learning process is less effective than reinforcement (Nilson, 2010). Nilson (2010) concludes that "While behaviorist theory is straightforward and rings true, the key to applying it is determining what students (and people in general) do or do not want" (p. 53). *Goal orientation* describes the student as motivated toward a goal, such as a grade of an 'A' in a course, as being *performance-goal oriented* (Dweck & Leggett, 1988; Hayamizu & Weiner, 1991).

Though this orientation is prevalent in the classrooms and labs in technical and other colleges, Nilson (2010) finds that a more important need exists for the educator is to bring that student to a place where the desire is to learn course content and material, or a *learning-goal oriented* is formed. Bandura (1977), in his social cognitive models, explains the motivation to learn as a relationship between the need of the adult learner and the perceived value of the coursework or instruction for which the student enrolls as factors of self-efficacy. In other words, the more value individuals place on an activity, the more they will learn. From this theoretical framework, it is important to show students how the coursework adds value to their lives. *Expectancy of goal achievement* or *expectancy theory* rests on student perceived agency and capability to attain a desired goal and the instrumentality of attaining that goal by applying oneself in a course of instruction (Wigfield & Eccles, 2000). Nilson (2010) points out that when

students do not believe that they can attain a certain grade or finish a course to a certain high level of competency, their motivation is affected accordingly. These students might not see themselves as earning an A, B, or F on an exam but, rather that the instructor *gives* them an A, B or an F.

Motivation Theory and the Adult Learner

The review of literature on adult learning theory explored the paradigms of Knowles (1984) where he describes adult learner motivation as comprising five factors from the European concept of *andragogy.* His paradigm posits that each learner possesses a level of *self-direction, past experience, readiness to learn, timing*, and *need to know* toward the learning experience (Merriam & Cafferella, 1999). Therefore, the motivation associated with a vocational student is to acquire a trade or technical knowledge to perform to fulfill their drives and desires toward a particular end. The individuals with the desire toward a certain vocation will be motivated not just to enroll but to persist in the course of training with the perceived end fulfillment in sight if they believe that the vocational or technical program will get them where they want to be and meet the needs in their lives (Abadi et al., 2011; Farmer, 2011). These *needs* are central to motivational theories of Alderfer (1972), Herzberg (1959), Maslow (1970), McClelland (1953), and Vroom (1995).

A review of the literature on motivation in adult learning found mostly descriptions of theories dealing with how and why adults participate in educational programs (Driscoll, 2000; Merriam & Caffarella, 1999; Wlodkowski, 2010) and how they are motivated to learn (Cross, 1981). These works present eight main theories of motivation. In her assessment of adult motivation to learn, Cross (1981) describes four theories, which draw strongly from Lewin's (Lewin & Cartwright, 1951) concept of force-field analysis framed in an educational form by

Miller (1967). The four theoretical frameworks are Miller's (1967) force-field analysis,

Rubenson (1977) and Vroom's (1995) expectancy-valence theory, Boshier's (1973) congruence

model, and Allen Tough's (1979) anticipated benefits. In an effort to unify these theories, Cross

(1981) attempts to synthesize the four previously mentioned theories as a Chain-of-Responses

theory (Cross, 1981; Merriam & Caffarella, 1999). Merriam and Caffarella (1999), in their

assessment of adult learner motivation, include the theories that Cross (1981) mentions and add

three additional theoretical models. These are Cookson's ISSTAL (interdisciplinary, sequential,

specificity, time, allocation, and life-span) model; Darkenwald and Merriam's (1982)

psychosocial interaction model; and Henry and Basile's (1994) decision model.

Another model for understanding the adult learner is Albert Bandura's (1986) paradigm

of self-efficacy dealing with beliefs that one holds about one's own ability to be successful in a

learning environment based on social role acquisition (Merriam & Caffarella, 1999). Driscoll

(2000) adds to the list Keller's (1983) instructional motivation design, focusing more on aspects

within the curriculum and instruction that motivate, rather than goals and goal orientation. These

theoretical frameworks for understanding what motivates the adult learner to participate and

learn all take into account factors of the environment that affect their decision to act towards or

away from activities of all types (Lewin & Cartwright, 1951; Tolmon, 1932). One of the major

motivational factors of the human experience is a need for work and a desire to get trained

toward that end (Daehlen & Ure, 2009), this is what makes goal-oriented or outcome-based

motivation theory most applicable to understanding what motivates those in technical education

(Colquitt et al., 2000).

Motivation and Training

Colquitt et al. (2000, p.678) defined *training motivation* as "the direction, intensity, and

persistence of learning-directed behavior in training contexts." Bandura's (1977) concept of self-efficacy corresponds to this definition pointing out that setting goals is paramount to motivation within an individual as they act toward that goal and that motivation depends on the believability that the goal can be reached. In education, the motivation to persist in the process is measured within each individual as an intrinsic value, matched by an extrinsic value toward goals set by that individual (Driscoll, 2000).

Kursurkar et al. (2011) found, in reviewing the literature in the medical training field and that personal goal setting was central to motivation in training for the medical vocation. They also found that motivation functioned as a predictor variable when affecting outcomes while functioning as a criterion variable from a reference of individual autonomy, competence, and perceived relatedness. These findings (Kursurkar et al., 2011) were consistent with the frameworks of Maslow's needs hierarchy (Maslow, 1970); Weiner's attribution theory (Weiner, 1974); social cognitive theory (SCT) (Bandura, 1986; 1989); goal theory (Pintrich, 2000); and self-determination theory (SDT) (Deci, et al., 2013). The study found that observable changes in the quality of motivation increased or decreased with the self-determined forms during the learning experience (Kursurkaret al., 2011). Kursurkaret (2011) points out that of all of the aforementioned theories, all except for SDT focus on the level of motivation whereas SDT looked at the quality of the motivation.

Colquitt et al. (2000) took this point further; pointing out that, of these two characteristics, training motivation has only recently received research attention. In their meta-analysis of the previous two decades of research on training motivation, Colquitt et al. (2000) found that empirical work in this area can be described as two approaches: one that proposes an all-encompassing model, factoring individual and situational characteristics for further testing,

and another approach looking at the effects of certain predictors on the learning experience.

Atkinson and Feather (1966) considered individual and situational characteristics and the learner's choices toward goals as cognitive choice, and thus the name *cognitive choice theories* of motivation. Colquitt et al. (2000, p. 682) add that "Perhaps the exemplar of this group of theories is Vroom's expectancy theory." The use of Vroom's (1995) expectancy theory from the cognitive choice theories is frequently used in understanding training motivation because the constructs of valence and expectancy are in the locus of control of the trainee in training context (Mathieu & Martineau, 1997).

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Related Literature

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Recent Studies Relating to Vroom's Expectancy Theory

The use of Vroom's expectancy theory was the theoretical framework of the Brooks and Betz (1990) study of introductory psychology students in measuring expectancy and valence levels of motivation with respect to six male-dominated and six female-dominated careers. The use of the force model of Vroom's (1995) expectancy theory to describe the relationship between the factors – expectancy and valence – found that that interaction accounted for from 12 to 41% of the variance in student choice of an occupation, although for a single factor, only expectancy acted as a good predictor in the product. The findings of this research affirm VIE theory as a tool in looking at student motivators based on valence and expectancy.

Caufield (2007) looked at student motivations to provide formative feedback to teachers in an effort at providing better instructional delivery. The theoretical framework used in the study used Vroom's expectancy theory combined with multiple regression analysis from data provided by both the valence and force models. The statistical analysis indicated that student motivation to give formative feedback correlated with the expectancy that that feedback would

result in a better instruction for their course or for the future students' coursework. Caufield's

(2007) research, therefore, provided a link between an instructor's actions and the desired effect.

In this case, it was found that it was important to solicit anonymous feedback from students that

in so doing the motivational force will increase. These findings did not, however, approach other

factors that might be explored though other lenses of theory related to the adult learners.

Gyurko (2011) used Vroom's expectancy theory as the theoretical framework to look at

issues of student motivation in conjunction with other social learning models with regards to

adult learners furthering their education toward student and career development. Gyurko (2011)

creates a synthesis between the components of expectancy theory as they are augmented by

several other educational theories in nursing education research. These other theories include the

Chapman model of college choice, social cognitive and social learning theory, Super's life-span

theory, and Perry's theory of intellectual and ethical development, as they include elements of

VIE theory that are paramount to their structure and theoretical basis. Particular focus is on the

use of these conceptual frameworks in predicting motivation toward furthering educational goals

in nursing education that could very easily be applied to other areas of technical education. The

purpose of the article is to set a context for nurse educators, the intended audience, which will

allow them to predict the factors that contribute to success as nurses advance in their schooling,

not only to predict the factors, but to even manipulate them to increase the probability of student

success (Gyurko, 2011).

Using the Within-Persons Approach in VIE Theory Research

This study replicated studies of Campbell et al. (2003), Geiger and Cooper (1996), Geiger

et al. (1998), Harrell and Stahl (1983), and Harrell et al. (1985) using the within persons decision

modeling approach developed by Stahl and Harrell (1983). This method involved multiple

decision-making situations each called a *case study*. Each case study required a separate decision based on a variety of combinations of values for two key elements of motivation through the lens of expectancy theory - *instrumentality* and e*xpectancy* of success. This judgment model used individual *decisions* as operational measures of valence and effort levels of motivation. The three second-level outcomes were presented at two levels of instrumentality – low (10%) and high (90%) and expectancy of increasing the course grade set at one of three levels – low (10%), moderate (50%), and high (90%). This design results in 24 different cases (2x2x2x3 = 24) presented to each participant. This method was paramount in this study in that it is the process for which the motivational factors - *valence* and *expectancy,* are operationalized to measure how much effort a student in a technical college classroom will put forth. These factors and this design are what make up the Technical College Student Motivation Survey (TCSMS) used in this study; a modification of the survey in the studies replicated from Geiger and Cooper (1996) in Figure 1.

The within-persons decision-modeling approach, developed by Stahl and Harrell (1983), was the method considered more accurate in describing student motivation (Campbell et al., 2003; Geiger & Cooper, 1996; Geiger et al., 1998; Harrell & Stahl, 1981,1983; Harrell et al., 1985) within the constructs of VIE theory and more specifically Vroom's (1995) models of valence and force in expectancy theory. A study by Harrell et al. (1985) marked the first of a series of research designs as replicated studies (Campbell et al., 2003; Geiger & Cooper, 1996; Geiger et al., 1998) using Vroom's (1995) expectancy theory to explain and predict student success in accounting, hypothesizing that motivational force could be predicted and explained using the force model of expectancy theory. In this initial study, the valence model was not examined (Harrell et al., 1985). The focus of the Harrell et al. (1985) study was built primarily

on the premise of Vroom's statement that "The only concept in the model that has been directly linked with potentially observable events is the concept of force" (Harrell et al., 1985; Vroom, 1995, p. 23). All subsequent studies to the Harrell et al. (1985) study (Campbell et al., 2003; Geiger et al., 1998; Geiger & Cooper, 1996) used the within-persons approach, noting it as more consistent with the basis of a within-persons formulation (Kopelman, 1977).

The Decision-Modeling Approach

Harrell et al. (1985) assert that the strength of the research design that seeks to use Vroom's expectancy theory to predict and explain student motivation is found in the use of the decision-modeling approach due to a within-persons formation of the theory. The use of the decision-modeling application came about based on the research findings of Stahl & Harrell (1983) reporting predictive measures with strong positive correlation coefficients averaging about R=0.86. The contribution to the body of research resulting from the utility of the decision-model in VIE theory research applications can be seen in the replication of Harrell et al. (1985) study by Geiger and Cooper (1996) using expectancy theory to assess motivation levels in accounting students in a university setting. This research was furthered with Geiger et al. (1998) in an international population group of accounting students from ten countries, and Campbell et al. (2003) study of the same population type, but in the Russian Far East region.

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Replication Studies: Findings and Results

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Research and the Force Model of Vroom's (1995) Expectancy Theory

A review of the research on the force model of expectancy found that it was an effective method of measuring valence and motivational force using the within-persons decision modeling approach was developed by Stahl and Harrell (1983). Harrell et al. (1985) explored the prospects of using Vroom's expectancy theory in explaining student motivation in the technical

field of accounting education. They framed the study looking at three hypotheses, the first (H_1)

stating that Vroom's (1995) force model of expectancy theory can effectively predict student

motivation toward academic success (Harrell et al., 1985). Geiger and Cooper (1996) and

Geiger et al. (1998) extended this further to specifically a higher GPA as the internalized point of

motivation to measure one's own academic success. The second hypothesis (Harrell et al., 1985)

(H2) predicted that as expectancy levels of success increased, a decrease in the marginally

increasing student motivational force levels would occur, a hypothesis used in Geiger and

Cooper's (1996) and the Geiger et al. (1998) replication of Harrell et al. (1985). The third

hypothesis (H3) sought to look at the correlation between a student's motivation level to succeed

in the coursework and the actual grades of those students (Harrell et al., 1985).

Table 3 provides an overview of these and others hypotheses in the replication of the

Harrell et al. (1985) study. Campbell et al. (2003) also included, as part of their study of

accounting students in the Russian Far East, a hypothesis that the weights associated with the

levels of valence and expectancy are placed there without regard to culture groups participating.

Harrell et al. (1985) found through multiple regression analysis (N=77) and using an instrument

resembling Figure 2, found statistical significance in regression models, with an average

individual correlation coefficient of $R =0.85$, data findings that strongly supports the first

hypothesis. Paramount to the design of the Harrell et al. (1985) study are the calculated

standardized beta weights associated with each of the three second-level outcomes with the

Decision A process that looks at that construct of valence. These weights indicated the

successful experimental manipulation of the second-level outcomes with improved GPR, or

grade-point ratio at 0.67 (SD=0.21); esteem of the classmates at 0.09 (SD=0.15); and personal

satisfaction at 0.47 (SD=0.22). The same multiple regression approach was used by Geiger and

Cooper (1996) and Geiger et al. (1998), looking at the specific second-level outcome of higher

course grade with resulting in mean adjusted R^2 ($N = 81$) of .69 and chisq = 8.72; $p = .46$,

respectively, each supporting the hypothesis that the force model of Vroom's (1995) expectancy

theory explains the motivation of a student to apply academic effort toward a higher course

grade.

The second hypothesis (H2) (Harrell et al., 1985) predicted that as expectancy levels of

success increased, a decrease in the marginally increasing of student motivational force levels

would occur. An analysis of the data using the paired-samples t-test was used to maintain the

data isolation of each individual and, therefore, maintain the within-persons integrity of Vroom's

expectancy theory. When comparing the data of motivational force when expectancy of success,

Eij in Equation 2, was set at a low level (.1 or 10%) or an intermediate level (.5 or 50%), the

values of the academic force were found to be larger than when expectancy of success is set at a

high level (.9 or 90%), rendering a strong support for the H2 with $t = 1.88$, p $= .03$ (Harrell et al.,

1985). These same results, $p < .01$, were shared in all replications of Geiger and Cooper (1996)

and Campbell et al. (2003) and only partial supported in Geiger et al. (1998) due to five out of

the ten countries examined showing marginally declining increases in motivation with an

increase in expectancy level as it applies to the force model.

The third hypothesis (H3) looked at the correlation of a student's motivation level to

succeed in the coursework and the actual grades of those students. An analysis of the data found

a statistically significant and strong correlation when expectancy was set at .1 ($r = .24, p = 0.02$)

and .5 ($r = .28, p = .02$) with no significance at the .9 level of expectancy of success. These

findings support this third hypothesis (Harrell et al., 1985). The author noted that this hypothesis

is unrelated to the force model of expectancy theory; however, it does elucidate a place in the

research that acknowledges the relationship of personal motivation to effort level in actuality

relating more to the valence model, a model not part of that research study (Harrell et al., 1985).

It should be noted that the Harrell et al. (1985) study was a seminal research study using the

force model of Vroom's expectancy theory from the within-persons decision-modeling method

from which several studies extended their research (Campbell et al., 2003; Geiger & Cooper,

1996; Geiger et al., 1998). Most of the replication studies using Vroom's expectancy theory

extended the body of research to include the valence model and the attributes of goal

attractiveness as a motivator.

Research and the Valence Model of Vroom's (1995) Expectancy Theory

Harrell et al. (1985) were instrumental in explaining the academic effort testing the force

model's ability to predict student success ($R = .86$). What was missing from the Harrell et al.

(1985) study was any test of the valence model of Vroom's (1995) expectancy theory with

regards to motivation. Building on the research of Harrell et al. (1985), Geiger and Cooper

(1996) sought to replicate the design and methods using the within-persons decision-model

approach to student motivation, using the valence model. Along with their second and fourth

hypotheses regarding the force model, previously mentioned, Geiger and Cooper (1996) sought

in their first hypothesis (H1) to test if the valence model of expectancy theory can explain a

student's perceived attractiveness toward achieving a higher course grade. A second hypothesis

(H3) (Geiger & Cooper, 1996) centered on comparing the perception of the valence of

increasing one's own grade to the believed attainability that same outcome of grade increase.

These same hypotheses were further replicated in Geiger et al. (1998) in an international

population group of accounting students from ten countries.

An analysis of the data from both Geiger and Cooper (1996) ($N = 81$) and Geiger et al.

(1998) ($N = 637$) found support of their first hypotheses, that the valence model of Vroom's

(1995) expectancy theory can explain a student's perceived valence toward making a better

grade in a course. A mean adjusted R^2 of .72 supports Geiger and Cooper's (1996) first

hypothesis (H1); Geiger at al. (1998) findings support their H1, with 94% of Canadian and

American students and 75% of Australian students showing significant valence models, when

multiple regressions were calculated on each individual. The other shared hypothesis of Geiger

and Cooper (1996) and Geiger et al. (1998), concerning valence, compared the perception of the

valence of increasing one's own grade to the believed attainability that same outcome of a grade

increase. The results of the analysis found support for these hypotheses as average standardized

beta weights, calculated for the factor of valence with regards to the specific second-level

outcomes, were .64 for valences as compared to .41 with regards to levels of expectancy. In

Geiger and Cooper's (1996) study and that of Geiger et al. (1998), eight out of ten countries

showed a statistically significance, through binomial testing, that valence played a dominant roll

over expectancy in student motivation toward a higher course grade.

This review of the literature found that later international replications (Campbell et al.,

2003; Geiger et al., 1998), though they shared central themes of testing the valence and force

models of Vroom's expectancy theory, focused on the accuracy of the models to predict student

motivations in a population, not exclusive to the American university system. The Geiger et al.

(1998) study used students ($N = 637$) in Australia, Canada, Hong Kong, India, Indonesia,

Malaysia, Mexico, Oman, and Singapore, and the Campbell et al. (2003) study in the Russian Far

East, extended of the research to include a cross-cultural analysis and assess the generalizability

of Vroom's (1995) expectancy theory.

A summary of the replication studies of Harrell et al.(1985) from Stahl and Harrell's

(1983) development of a within-persons decision-modeling approach found that the force model

of Vroom's (1995) expectancy theory can accurately predict a student's effort level in

motivation. Geiger and Cooper (1996) incorporated the valence model in the research testing

process, finding that it, too, explains the role of attraction toward a goal in the motivation

process. This research was further extended toward explaining the force and valence models in

studies using students in an overall eleven countries and resulting in positive support for all

hypotheses posited (Campbell et al., 2003; Geiger & Cooper, 1996; Geiger et al., 1998).

Research Studies and Hypotheses Replicated in this Study

The research questions in this study have parallel corresponding hypotheses in previous

studies. Central to this study is the linear relationship of valence and expectancy on the effort a

student is willing to put forth given both learning and performance goals presented as outcomes.

This researcher sought to answer four questions about student motivation to pursue a higher

grade in their core academic classes through the lens of expectancy theory. The first question

(RQ#1) looks as the linear relationship between valence and expectancy in a sample population

of degree students enrolled in a core academics class that is common to all degree programs at a

technical college. This question was addressed with hypotheses in studies by Harrell et al.

(1985), Geiger and Cooper (1996), and Geiger et al. (1998). Harrell et al. (1985) in testing the

ability of the force model of expectancy theory to predict student motivation found that the

empirical data gave strong support for the hypothesis with an average multiple correlation

coefficient of $R = .85$. Geiger and Cooper (1996) had similar results with mean adjusted $R^2 = .69$

adding strong support for their research hypothesis. Vroom's force model is formed on the

assumption of a multiplicative relationship between valence, Decision A, and expectancy

variable data with effort levels, Decision B. In the latter study the issue of responses indicating

the use of additive process models was noted with 69 of the 82 students employing the additive

process and only 13 using the multiplicative process. The findings of the regression analysis

using the additive form of the force model found that all but one were significant (p<.05) leaving

81 multiple regressions for analysis and a mean adjusted R^2 of .69 attesting to the ability of the

force model to explain effort levels of students in a classroom. Out of the 81 students that

responded with significant correlations (p<.05), 13 used multiplicative processes with an average

R^2 increase of only 0.08. The other 69 students used the additive model. The mean adjusted R

squared for all 81 (one student's responses were not significant) was reported in the study as

0.69.

Geiger et al. (1998) looked also at the linear relationship of the factors in expectancy

theory and the force model in particular, but did so across multiple countries. Their study found

that students with significant valence models also had significant force models and using a Chi-

square test found no significant differences (chisq=8.72; $p = .46$) across the countries examined

supporting their hypothesis and the efficacy of the force model. It can therefore be concluded

that according to research on accounting students, the population sample for the previously

mentioned studies, that the force model of Vroom's expectancy theory (1995) is an effective tool

for looking at student motivation and the willingness to apply themselves in the classroom. The

gap remains whether the linear relationship between valence and expectancy, given the same

goals and instrumentality levels used in these studies, would measure the same in a population of

technical college students in the United States.

The second and third research questions (RQ#2 & 3) look at whether valence or

expectancy weighs heavier on motivation levels toward greater effort toward a higher grade in a

particular class. Harrell et al. (1985) and Geiger and Cooper (1996) in their study of the linearity

between valence and expectancy found that valence was the predominant factor in the force model of motivation with regards to academic effort. Campbell et al. (2003) and Geiger et al. (1998) and looked at further at whether the perceived valence of increasing one's grade motivates more than the attainability of increasing that grade. In these studies the researchers use the term *attainability* as synonymous with *expectancy* of the individual. Geiger et al. (1998) found that when looking at this relationship using standardized beta weights in a sample across ten different countries (Australia, Canada, Hong Kong, India, Indonesia, Malaysia, Mexico, Oman, Singapore, and United States) that valence had statistical dominance (p<.001) in eight out of the ten countries sampled. In the two countries where valence was not the dominant factor, Hong Kong weighted valence and expectancy evenly and Singapore "with their high aversion to uncertainty" (p.149) weighed expectancy more heavily than valence. Therefore, this study could not affirm that the factor of valence in the force model of expectancy theory has a heavier weight in the motivation model than expectancy across all countries.

Campbell et al. (2003) specified also that they were looking specifically at Russian students on this matter following on the research of Geiger and Cooper (1996) and Harrell et al. (1985) that found that valence was the predominant factor effecting effort levels in accounting students in the United States and the research of Geiger et al. (1998) finding similar results in most cultures examined. Campbell et al. (2003) found however, that Russian students showed a greater dominance of expectancy with regards to effort levels with strong negative correlations between valence and expectancy indicting an exclusive relationship with either valence or expectancy having a greater impact on effort level decisions. In fact, of the 133 participants in the study 53 showed a predominance of valence and 80 showing a greater weight on expectancy. An interesting point in this study is that when analyzed by gender, 65% of the female

participants were influenced more by expectancy than the 44% of male participants. In females the mean standardized beta weights was higher for expectancy than valence; while in males the values for valence and expectancy were equal indicating that female Russian students have a greater dislike to uncertainty than male students in their same programs.

The fourth research question (RQ#4) looks at the effort levels across different academic programs at a technical college. Though there are no studies that look at effort levels of technical college degree students through the lens of expectancy theory; Geiger et al. (1998) and Campbell et al. (2003) did, however, look at effort levels across various cultures and student groups. The technical college from which the sample in this study will be taken are from degree students in five different academic programs that function as categorical predictor variables much in the same way as Hofstede's five cultural indices were evaluated in the ten countries surveyed by Geiger et al. (1998) testing whether expectancy theory and the three second-level outcomes: (a) higher GPA (GPA), (b) superior performance in first job after college (JOB), and (c) strong feeling of self-satisfaction (SAT), the same outcomes used in this study. Correlations were performed categorically across multinational settings using these outcomes and expectancy theory models and significant correlations were found ($p<.05$).

Technical College Degree Program Divisions Defined

A review of the literature on students learning in a training environment found that the role of goals that a technical education program places on competencies has a great impact on students success in retaining the information toward their intended field (Smith, Jayasuriya, Caputi, & Hammer, 2009). This same issue of motivation in student training using learning goals and performance goals was conducted by Zaniboni, Fraccaroli, Truxillo, Bertolino, and Bauer (2011). Their study (N=254) found when using valence-instrumentality-expectancy (VIE)

theory that certain antecedent factors exist within a person affect motivation such as their personality, job involvement, career exploration and planning, organizational commitment, self-efficacy, and goal orientation. These researchers found that though the factors exist it was the motivation oriented to goals that presented dominance in resultant effort of a student. Furthermore it was the valence toward goals from a nomological basis that motivated individuals in technical training and education to teach (Zaniboni et al., 2010). In other words some students believe they can attain a goal simply because they believe they can attain and they want to certain outcomes simply because that is what they want.

What was lacking in the reviewed literature was any review of the motivation in students receiving training received from an institution, such as a technical college, that adds a unique dimension of academic courses combined in a training experience where specific skills are the aim. Plenty of research exists with regards to training that have been explored on skills training (Gegenfurtner et al., 2009; Kursurkar et al., 2011). The current use of expectancy theory to look at student motivation in the training environment and the fact that accounting is a skill set taught at both technical colleges as well as the university systems lead this researcher to believe that the gap in the research can be effectively filled by replicating the design and many of the methods used by Campbell et al. (2003); Geiger and Cooper (1996); Geiger et al. (1998); and Harrell et al. (1985) using a sample from a technical college offering not only a degree in accounting, but 36 other programs. A complete breakdown of the divisions and current enrollment in each is presented in Table 4.

The technical colleges in the state of Georgia generally viewed as vocational / technical schools, also have accounting degree students along with 36 other degree programs all containing the same core academic course required to graduate. These degree programs all fall

under five divisions in this technical college in the Middle Georgia region with a breakdown of specific degree programs and current enrollment numbers in Table 4. The five degree divisions are as follows: (a) Aerospace, Trade, and Industry, (b) Business and Computer Technologies, (c) Health Sciences, (d) Public Safety and Professional Services, and (e) Technical Studies at the technical college.

The study looks at variance in academic effort (motivational force) as it relates to several various technical college degree programs and the effect of goals and levels of expectancy on student motivation.

Summary

This review of the literature began with the theories of motivation relating to adult learners, followed by a review of current research on motivation and training.   Motivation was defined as having goals and factors that affect an adult learner to act toward that goal, making the focus of valence, instrumentality, and expectancy theory, and more specifically Vroom's expectancy theory, directly applicable to the study of motivation theory in technical education. A review of research that uses Vroom's expectancy theory was conducted, with explanations from literature in support of the within-persons decision-modeling approach.   A series of replication studies were reviewed, beginning with Harrell et al.(1985), followed by Geiger and Cooper (1996), Geiger et al. (1998), and Campbell et al. (2003). These studies found strong support for Vroom's expectancy theory as a theoretical framework for explaining student motivation using the valence model and force model. The accuracy of the findings makes a replication of these studies, with regard to technical college student motivation, an excellent extension of existing research.

Sample Case Study

If you receive a "B" in this course, the likelihood this will result in
  …an improved overall Grade Point Ratio (GPR) is………………..LOW (10%)*
  …esteem in the eyes of your classmates is……….……………..HIGH (90%)
  …a stronger feeling of personal satisfaction is…………………….LOW (10%)**

DECISION A. With the factors and likelihoods shown above in mind, indicate the attractiveness to you of receiving a "B" in this course.

-5	-4	-3	-2	-1	0	+1	+2	+3	+4	+5
Very										Very
Unattractive										Attractive

FURTHER INFORMATION. If you exert a great study effort during the remainder of this semester, the likelihood you will earn a "B" in this course is HIGH (90%).

DECISION B. With the attractiveness and likelihood information above in mind, indicate the study effort you will exert for this course until completion.

1	2	3	4	5	6	7	8	9	10	11
Low					Average					Great
Effort					Effort					Effort

*It seems likely that so much effort is required to earn a "B" in this course that doing so means your grades in other courses will suffer, resulting in no improvement to your overall Grade Point Ratio (GPR).

**Earning a "B" in this course is no indication of real accomplishment; therefore no feeling of personal satisfaction would result from doing so.

Figure 1. Sample Case Study from the Planned Decision Cases Used by Harrell and Stahl (1985), Geiger and Cooper (1996), Geiger et al. (1998), Campbell et al. (2003).

Table 2

Scenarios for Case Studies by Outcome at Two Levels of Instrumentality (Low or High) used in the TCSMS (survey).

Scenario #1 (Case Study 1-3)
 	
If you receive a higher grade in this course, the chances are HIGH that you will…
    …increase your overall GPA
    …have a better technical knowledge resulting in better job performance after college
    …have a stronger sense of self-satisfaction.
	Scenario #5 (Case Study 13-15)
	
	If you receive a higher grade in this course, the chances are HIGH that you will…
	    …have a stronger sense of self-satisfaction
	but chances are LOW that you will…
	    …increase your overall GPA
	    …have a better technical knowledge resulting in better job performance after college.

Scenario #2 (Case Study 4-6)
 	
If you receive a higher grade in this course, the chances are HIGH that you will…
    …increase your overall GPA
    …have a better technical knowledge resulting in better job performance after college
but chances are LOW that you will…
    …have a stronger sense of self-satisfaction.
	Scenario #6 (Case Study 16-18)
	
	If you receive a higher grade in this course, the chances are HIGH that you will…
	    …have a better technical knowledge resulting in better job performance after college
	but chances are LOW that you will…
	    …increase your overall GPA
	    …have a stronger sense of self-satisfaction.

Scenario #3 (Case Study 7-9)
 	
If you receive a higher grade in this course, the chances are HIGH that you will…
    …increase your overall GPA
but chances are LOW that you will…
    …have a better technical knowledge resulting in better job performance after college
    …have a stronger sense of self-satisfaction.
	Scenario #7 (Case Study 19-21)
	
	If you receive a higher grade in this course, the chances are LOW that you will…
	    …increase your overall GPA
	    …have a better technical knowledge resulting in better job performance after college
	    …have a stronger sense of self-satisfaction.

Scenario #4 (Case Study 10-12)
 	
If you receive a higher grade in this course, the chances are HIGH that you will…
    …increase your overall GPA
    …have a stronger sense of self-satisfaction
but chances are LOW that you will…
    …have a better technical knowledge resulting in better job performance after college.
	Scenario #8 (Case Study 22-24)
	
	If you receive a higher grade in this course, the chances are HIGH that you will…
	    …have a better technical knowledge resulting in better job performance after college
	    .…have a stronger sense of self-satisfaction
	but chances are LOW that you will…
	    …increase your overall GPA.

Table 3

Research Studies and Hypotheses using Vroom's Theory Related to this Study

Research	H1	H2	H3	H4	H5	H6
Harrell et al. (1985)	A student's motivation toward academic success can be predicted the force model of expectancy theory.	N/A	N/A			
Geiger and Cooper (1996)	N/A	A student's level of academic effort can be predicted using the force model of expectancy theory.	The valence of getting a better grade motivates more than the expectancy level of getting a better grade.	N/A		
Geiger et al. (1998)	The attractiveness toward a higher course grade can be predicted using the valence model of expectancy theory for all student groups.	The valence model beta weights, attached to the second-level outcomes, will differ across student groups	A student's motivation toward academic success toward a better course grade can be predicted by the force model of expectancy theory.	The perceived valence of increasing one's grade motivates students more than the attainability of increasing one's course evaluation.	N/A	"There are differences between students of different cultures in the efficacy of the expectancy models and the weights placed on the respective components" (p.142)
Campbell et al. (2003)	The beta weights attached to second-level outcomes in the valence model will differ across student groups.	Student groups with larger proportions of academically distinguished students will place greater emphasis on improving GPA compared to other groups.	"The perceived valence of increasing a course grade will motivate Russian students more than the expectancy of increasing a course grade." (p. 128)	"The weights placed on expectancy and valence in the force model will not differ across student groups." (p. 129)		

Table 4

Technical College Degree Programs by Division (N=2302)

Aerospace, Trade, and Industry (n=152) **Code C1**	**Public Safety and Professional Services (n=516)** **Code C4**
Aviation Maintenance Technology (43)	Criminal Justice Technology (173)
Cabinetmaking (1)	Early Childhood Care/Education (254)
Carpentry (3)	Emergency Management (20)
Construction Management (16)	Paralegal Studies (69)
Drafting Technology (12)	
Electronics Technology (46)	
Geographic Information Systems (4)	
Industrial Systems Technologies (12)	
Instrumentation Controls (6)	
Metrology (9)	

Business and Computer Technologies (n=818) **Code C2**	**Health Science (n=772)** **Code C3**
Applied Technical Management (6)	Advanced Medical Imaging (5)
Accounting (111)	Biotechnology (29)
Banking and Finance (14)	Cardiovascular Technology (56)
Business Admin. Technology (216)	Clinical Laboratory Technology (47)
Business Management (151)	Dental Hygiene (204)
Computer Programming (25)	Gerontology (7)
Computer Support Specialist (60)	Medical Assisting (87)
Design & Media Production Tech. (22)	Orthopedic Technology (27)
Distribution/Materials Management (33)	Paramedic Technology (9)
Hotel/Rest./Tourism Management (26)	Radiologic Technology (301)
Information Tech. Professional (67)	
Internet Specialist-Web Site Dev. (20)	
Marketing Management (35)	
Networking Specialist (54)	

Technical Studies (n=44) **Code C5**

Note: Information from
https://intranet.centralgatech.edu/cfbanner/enrollment/byprogram/enrollbyprogram.cfm

CHAPTER THREE: METHODOLOGY

The purpose of this predictive correlational study is to look at what motivates technical college degree students in their core academic courses, using the factors of expectancy and valence in expectancy theory to operationalize student effort to achieve a higher grade. This study replicated the research of Stahl and Harrell (1981), and Geiger and Cooper (1996), which used a within-persons decision making modeling approach to test the multiplicative force model of V.H. Vroom's (1964) Expectancy Theory.

Design

A correlational design will be used in this study to explore student motivation in the technical college degree programs using Vroom's expectancy theory of motivation as a theoretical framework. Rovai et al. (2013) recommend this design model stating that it allows the researcher to describe the relationship between the two predictor variables −valence and expectancy- on the criterion variable- effort- without controlling or manipulating the participants or their learning conditions. Gall et al. (2007) support the use of the correlational study recommending it as "nothing more than collecting data on two or more variables for each individual in a sample and calculating a correlation coefficient." They go on to emphasize that the quality of the correlational study lies not in the complexity of the design, but in the rationale of the design and theoretical constructs that define its basis (Gall et al, 2007). Vroom's expectancy theory (1964) posits that an individual's effort level can best be understood in its correlation the relationship between their valence toward goals and the expectancy level of attaining them.

This correlational design uses the survey data of technical college degree students from the five degree divisions at the technical college. The study operationalizes the values of

valence, expectancy and effort using the decision modelling approach developed for this by Stahl and Harrell (1981) in a survey instrument. "Judgment modeling approach uses individual's decisions as operational measures of valence and effort. The three second-level outcomes were presented at two levels of instrumentality – low (10%) and high (90%) – and expectancy of increasing one's subject mark were set at three levels – low (10%), moderate (50%), and high (90%). This design results in 24 different cases (2x2x2x3) presented to every subject" (Geiger& Cooper, 1996, p.117; Geiger et al, 1998, p.143). This study design modified the survey to fit the technical college degree student using goals for the valence decisions that match technical college student desired outcomes – higher GPA, greater knowledge level toward a job, and self-satisfaction.

This non-experimental correlational design allowed for the data provided though the survey for the correlation of the student's motivational effort and the two factors valence and expectancy for multiple regression analysis (Gall et al, 2007; Rovai et al, 2013). Because of the nature of the sample group other design models were not used such as the non-experimental causal comparative design and quasi-experiment or true experimental which would use a control group and explore cause-and-effect relationships.

Research Questions and Hypotheses

This research study answered the following research questions (RQ) with the associated null hypotheses (H_0):

RQ#1 – Is there a statistically significant correlation between a student's belief that a higher grade can be achieved (expectancy score) combined with the desire for that grade (valence score) to a student's academic effort (effort score) to attain that grade?

$H_0 1$ – There is no statistically significant correlation between a student's belief that a

higher grade can be achieved (expectancy score) combined with the desire for that grade (valence score) to a student's academic effort (effort score) to attain that grade.

RQ#2 – Does a student's desire for a higher grade (valence) have a greater contribution to motivational effort than expectancy?

H$_0$2 – A student's desire for a higher grade (valence) does not have a greater contribution to motivational effort than expectancy.

In this study, the force model of expectancy theory (Vroom, 1964) was used to examine the *force* (F) or level of academic effort to perform act (i), referred to as Fi, that an individual will put forth by taking the valence, defined as the attractiveness of the outcome to the individual, (Vj) and combining it with expectancy of the individual that their action will achieve the desired outcome (E), that effort (i) will result in a higher grade (j), or Eij. According to Vroom (1964), this model can be illustrated mathematically as a multiplicative model Fi = (EijVj). However, this study replicated the HMR modeling structure of the studies of Stahl and Harrell (1981) and Geiger and Cooper (1996), in which a regression model with student effort regressed onto the additive terms of valence and expectancy was modeled in Block 1, and the multiplicative term of valence X expectancy was entered into Block 2. The purpose of these steps were to analyze the correlation of the factors contributing to student motivation –valence and expectancy- with respect to effort levels from the theoretical framework of Vrooms' expectancy theory whether additive or multiplicative in their nature. The predictor variables – valence and expectancy- where analyzed as their individual contributions to effort levels of the technical college degree student.

Participants

The *population* of this study centered on technical college students. This research study

took its sample from a technical college in the Middle Georgia region. Although the demographics information was not gathered as part of the survey the population from which this sample was drawn had the following characteristics: 2014 Summer Semester: 1570 African-American, 1,245 white, 83 multi-racial, 69 Hispanic, 27 Asian, and eight American Indians. It also included gender samples with a 37% male and 63% female student population in a total enrollment of 4,859 students; 1916 of those are degree-Level students. The mean age of the student population at this technical college was 28.2 years, and the college was in the vicinity of a very large military base that is the major employer in the region. Several cooperative agreements existed between the technical college and the base, making the technical college a very attractive conduit.

All of the students in this study were enrolled full-time in a degree level program of study and have completed at least one semester of core academic courses toward their program of study. All participants are categorized as in one of five possible degree program divisions: (a) Aerospace, Trade, and Industry, (b) Business and Computer Technologies, (c) Health Sciences, (d) Public Safety and Professional Services, and (e) Technical Studies. A complete breakdown of the degree programs in each division and the current enrollment numbers are included in Table 4.

The nature of the correlational design using the within-persons decision-modeling approach allowed for a convenience sample group (Gall et al., 2007) and was selected because the study is looked at the motivation in technical college students. As stated above, a technical college in the Middle Georgia region with over 4850 students was the population from which volunteers for participation were sought for a sample. The sampling procedure in this design used a convenience sample from the population frame of 1916 FTE degree students from a

BANNER database at the technical college. The appropriate sample size from this population

and for this study was calculated using Cohen's (1992) conventions and prior research using

Geiger and Cooper (1996) for effect size estimates (Rovai et al., 2013).

Sample Size

This researcher conducted an *a´priori* power analysis to calculate the required sample

size for this research study. According to Cohen (1992) in sample size calculation there are three

factors to consider: effect size, statistical power, and the level of significance.   Effect size of the

study was the amplitude of strength in the relationship between the predictors and criterion

variables in the analysis (Cohen, 1992). Cohen (1992) recommends that the effect size for HMR

is measured by f^2 which was computed as $[R^2_{AB}-R^2_A/(1-R^2_{AB})]$, where R^2_{AB} is the variance

accounted for in the full model (after the addition of Block 2 predictors) and R^2_A is the variance

accounted for in the Block 1 model. Cohen (1992) set conventions of the f^2 effect size as small

as 0.10, medium as 0.25, or large at 0.40. This study mirrors the work of Geiger and Cooper

(1996), and effect sizes for this study were computed from the results of their study, with an R^2_{AB}

and R^2_A of .77 and .69 respectively. Inserting the values from the Geiger and Cooper (1996)

study into the formula returned an effect size of 0.35, which was used for the power calculations

of this study.

The alpha level for this study was set at 0.05, for a 95% level of significance (Gall et al.,

2007; Howell, 2011; Rovai et al., 2013). In other words, this researcher wanted to be 95%

confident that the probability of making a Type I error (rejecting the null hypothesis given that it

is in fact true) was kept to 5%. Conversely, the power of this study is the likelihood of being

able to see significance that truly existed in the data, thus rejecting a false null hypothesis $(1 - \beta)$,

with β representative of Type II error (failing to reject a null hypothesis when it is in fact false).

A power of 80% is conventionally used for quantitative research (Cohen, 1992; Gall et al., 2007; Howell, 2011; Rovai et al., 2013). The conventions of $\alpha = .05$ and $1-\beta = .80$ were used to power this study.

This researcher calculated sample size by downloading and using G*Power (v 3.1.9.2), an analysis software designed to calculate sample sizes for various research statistical methods. The following conventional values (Cohen, 1992) are used in the software for determining sample size: statistical power of .80, effect size of 0.35, and Level of significance at an alpha of 0.05. The study was powered for 2 Block 1 predictors (valence + expectancy) and 1 Block 2 predictor (valence X expectancy). Based on these parameters, the sample size required 25 records. A total of 24 records were obtained for each student, one short of the needed sample size. However with a sample of 24 records per student, the power for each of the 71 student regressions was 79%, very close to the 80% convention.

Setting

The setting for this research study was a technical college in the Middle Georgia region with a current enrollment of 4859 adult learners of which 1916 were enrolled in one of the 37 associate degree programs offered at the college. Each of the degree programs fell under one of five divisions: (a) Aerospace, Trade, and Industry; (b) Business and Computer Technologies; (c) Health Sciences; and (d) Public Safety and Professional Services; and (e) Technical Studies. Though some programs such as Radiological Technology program have selective admission into the professional program courses, all division degree programs were open admission with regards to academic core classes. It should be noted that the technical college from which this sample was taken via survey, is one of the 29 technical colleges in the Technical College System of Georgia (TCSG) and accredited through the Southern Association of Colleges and Schools /

Commission on Colleges (SACS/COC) to offer the associates of science degree each of which have set core academic requirements. This study looked at those students in core classes in those degree programs and sought to explore what motivated them to apply themselves in their core classes. It should also be noted that all core academics and general education classroom in this college have computers with internet access to email and SurveyMonkey for which the survey was administered. Each participant took the survey during class time in their classroom/computer lab after a brief introduction and instructions by this researcher for the study, for taking the online Technical College Student Motivation Survey (TCSMS). A week was set aside to allow students to take the survey, and the survey period will closed at the end of the week. Pizza and donuts (depending on the time of day of the class) were provided to each class at the end of the class period for an incentive to and appreciation for taking the survey.

Instrumentation

A self-evaluation survey was administered as the instrument for evaluating levels of valence and effort levels controlling for the expectancy level.

Data was gathered and measured using the Technical College Student Motivation Survey (TCSMS). The TCSMS is an adaptation of the survey developed by Stall and Harrell (1983), used on several research studies in accounting education, and is found to be accurate and reliable using a parallel forms internal consistency reliability by using average individual multiple correlation coefficient squared (R^2) values ranging from .60 to .97 for measuring internal consistency reliability in all studies (Geiger & Cooper, 1996; Geiger et al., 1998; Harrell & Stahl, 1983; Harrell et al., 1985; Stahl & Harrell, 1983). Internal consistency reliability for this instrument in this study was considered reliable using Cronbach's alpha of 0.7 or higher (Rovai et al., 2013).

Over the years this instrument in its many forms and an minor variations have been used to operationalize the factors – valence and expectancy – on effort levels using the decision-modeling process based on the 24 case study scenarios for the purposes of validating the survey in both reliability and validity (Geiger & Cooper, 1996; Geiger et al., 1998; Harrell & Stahl, 1983; Harrell et al., 1985; Stahl & Harrell, 1983). Internal consistency reliability of the data collected in this study was also assessed via Cronbach's coefficient alpha coefficients. The Cronbach's alpha coefficients for internal consistency reliability of the TCSMS with the data collected in this study ($N = 71$ students) were .902 and .884 for the valence scores and student effort scores respectively.

The TCSMS was designed with four simple sections. The first section presents controls for level of instrumentality (*Ijk*), as either low (.1) or high (.9). The instrumentality values were set by the researcher for each of the 24 case study scenarios of the TCSMS. The second section is where the student made a decision, Decision A, on the attractiveness (valence = Vj), of making a higher course grade in a current course based on the instrumentality level. The third section of the survey controls for expectancy of success (expectancy = *Eij*) at low (.1), moderate (.5), or high (.9). As with the instrumentality values of section one, the expectancy values of section three were set by the researcher for each of the 24 scenarios of the TCSMS. The fourth and final section of the TCSMS required the student to make and report another decision, Decision B, which conveyed the level of effort or academic force (student effort = *Fi*) that they would put forth given his or her response for section one (valence = Vj) and the researcher defined level of expectancy of success (expectancy = *Eij)* from section three of the TCSMS

The decision scores of a student for valence and effort, along with the researcher set level of expectancy, for each of the 24 case studies were utilized in an individual HMR for each of the

71 students. Therefore, a total of 24 records, representing each of the 24 case study scenarios, were included in the hierarchical regression for each individual student, for a total of 71 hierarchical regression models.

This survey provided the researcher with the data required for analysis of the research hypotheses in this study. The continuous criterion variable for all hypotheses in this study was provided for as Decision B data that operationalizes *effort* Level. Scores of effort level range from 1 (low effort) to 11 (great effort). Decision A data operationalizes the motivational factor *valence* in this study with scores ranging from -5 (very unattractive) to 5 (very attractive). Valence was an ordinal Level, but was treated as a continuous predictor variable. *Expectancy* values came from the "Further Information" section of the survey. Scores are ranked as low (.1), moderate (.5), and high (.9). Expectancy was an ordinal Level predictor variable, but was treated as continuous in this study.

Procedures

This researcher submitted an IRB request to both the technical college and to Liberty University, and upon approval began conducting the study. The sample population for this study was college degree students enrolled in a core academic course required in their program of study in a technical college were taken in the classroom or local computer lab. It should be noted that at the technical college in this Middle Georgia region, all classrooms in academic core classes had computers with internet connections to easily access the TCSMS. A pilot was conducted prior to the official week of the survey to ascertain time allocation for the survey process (Gall et al., 2007). The study began with a participation request via student e-mail and subsequent class announcement by the instructor on the date of the survey before class started, an Invitation to Participate, was emailed to the class participants with the link to the survey in the

email along with a brief description of the survey and the study. The class roster was used by the instructor to verify that the students taking the survey were enrolled in a degree level core class and under the age of 18. This method was used to safeguard the identity, privacy, and anonymity of each participant in the experiment. Each participant read and acknowledged the consent form as precursor to starting the survey and participating in the research.

In order to gather data for testing Vroom's (1995) expectancy theory, an instrument was needed that would allow the researcher to analyze the criterion variable, effort, while manipulating the predictor variables – valence and expectancy. The TCSMS contained 24 cases, each requiring a different response from participants with regard to their valence (continuous variable) and academic effort Levels (continuous variable). The online format of the TCSMS had a randomization function that this researcher employed to reduce response bias (Geiger & Cooper, 1996; Geiger et al., 1998; Harrell & Stahl, 1983; Harrell et al., 1985; Stahl & Harrell, 1983). As respondents completed their surveys, the data was immediately recorded as a function of the Survey Monkey format. A total of 198 emails were sent to students, with 112 responses received. Of the 112 responses, 29 were incomplete. This study replicated the research of Stahl and Harrell (1981), and Geiger and Cooper (1996). Those studies included only students who had complete data records for all 24 scenarios of the TCSMS. Therefore, the 29 students with missing data records were removed from the study. An additional 12 students were removed from the study because their responses for each of the 24 TCSMS scenarios were identical, thus creating constant terms for their individual hierarchical regression models. A total of $N = 71$ students were retained for the study.

After the gathering of the self-reported data, multiple hierarchical regression and ANOVA analyses were conducted using SPSS version 22. Findings of the study were made

available to all participants via email request.

Data Analysis

This study used a correlational design that replicated the study by Stahl and Harrell (1981) and Geiger and Cooper's (1996) looking at university accounting student motivation. This study made use of a series of hierarchical multiple regressions (HRM) to measure associations between predictors -valence and expectancy- as relates to a criterion of student effort (Hypothesis 1). This process provided squared semi-partial correlation coefficients for analysis of the contribution of each variable (Hypotheses 2 and 3). The specifics of the data analyses performed in this study are presented according to each research question as follows:

RQ#1 – Is there a statistically significant correlation between a student's belief that a higher grade can be achieved (expectancy score) combined with the desire for that grade (valence score) to a student's academic effort (effort score) to attain that grade?

H$_0$1: There is no statistically significant correlation between a student's belief that a higher grade can be achieved (expectancy score) combined with the desire for that grade (valence score) to a student's academic effort (effort score) to attain that grade.

Regression analysis is the recommended methodology when looking at the relationship between multiple predictor variables and the criterion variable to gain the *main effect* (Howell, 2011). The *main effect* is the influence of the predictor variables have on the criterion variable (Howell, 2011). Further, Rovai et al. (2013) and the sixth edition of the American Psychological Association (APA) manual emphasize HMR as a method of analysis because it gives the researcher an adjusted coefficient of determination (R^2) an appropriate *effect size* statistic.

The hierarchical regression models were developed using the within-persons decision-modeling approach to replicate the methodology of Stahl and Harrell (1983) and subsequent

research (Campbell et al., 2003; Geiger & Cooper, 1996; Geiger et al., 1998; Harrell et al., 1985) that operationalized *expectancy* and *valence* as the components of student motivation. In each of the 24 case studies, the student was asked to make two decisions, and the scores given by the student for each of the two decisions were used as the predictors of valence and expectancy in the hierarchical regression models of each student. The first decision was to report the attractiveness (valence) to the student of receiving a higher grade in a core academic course, given the likelihood of attaining the goals each set at various levels of the first three scenarios (the scenarios with the 2 levels of low versus high). The second decision, which measured student effort, asked the students to report the level of effort that they would put forth toward a higher grade in their course given various expectancy level of success [the fourth scenario with one of three level of low (.10), moderate (.50), or high (.90)] combined with the attractiveness level of the first decision. The decision scores for valence and effort, along with the level of expectancy, given by each student for each of the 24 case studies were utilized in an individual HMR for each of the 71 students. Therefore, a total of 24 records, representing each of the case study scenarios, were included in the hierarchical regression for each individual student, for a total of 71 hierarchical regression models. The results of the regression model for each student were then used to classify the student as either an additive or multiplicative decision maker for his or her student effort outcome.

A replication of the HMR modeling structure of the study Geiger and Cooper (1996) was performed to test and make inferences for Research Questions 1 and 2. A HMR was performed for each of the $N = 71$ students, using the information obtained from his or her $N = 24$ case study scenarios from the TCSMS instrumentation. A multiple regression with student effort regressed onto the additive terms of valence and expectancy was modeled in Block 1, and the

multiplicative term of valence X expectancy was entered into Block 2. The HMR tested if students preferred the additive or multiplicative model for overall correlational analysis (Hypothesis 1), and if valence or expectancy contributed more to student effort at Block 1 (Hypothesis 2 and 3). The interaction effect at the second Block of the regression was used to compare additive (Block 1) and multiplicative (Block 2) models of Vroom's force equation. If the interaction term of Block 2 returned a statistically significant R^2 change from the Block 1 model, then those students were classified as multiplicative processors, and the other students (not a sig. R^2 change) were classified as additive processors. This analysis technique is used to be consistent with the research of Stahl and Harrell (1981) and Geiger and Cooper (1996) in looking at student motivation through the lens of expectancy theory whether effort decisions are multiplicative as Vroom (1964, 1995) originally posited or the more parsimonious additive process shown in later research (Campbell et al. 2004; Geiger & Cooper, 1996; Geiger et al., 1998).

RQ#2 – Does a student's desire for a higher grade (valence) have a greater contribution to motivational effort than expectancy?

H$_0$2 – A student's desire for a higher grade (valence) does not have a greater contribution to motivational effort than expectancy.

If both predictors were significant (p<.05) for the regression results of a student, then the squared semi-partial correlation coefficients for each of the predictor variables of Valence and Expectancy were compared to assess the unique contribution of each variable to variance in the student effort outcome. The difference in the mean values of the squared semi-partial correlation coefficients for valence and expectancy were compared. Additionally a paired samples t-test (p<.05) was performed on the squared semi partial correlation coefficients Block 1 of the $N = 61$

significant regression models, to compare the mean values of the squared semi partial correlation coefficients for the variables of Valence vs. Expectancy. The non-significant findings indicate that the mean difference between the two sets of squared semi partial correlation coefficients were analyzed as their being not different from zero. Squared semi-partial correlation coefficients from the HMR models of all participants were used for hypothesis testing on hypothesis 2 (Gall et al, 2007; Rovai et al., 2013).

For this correlational study, using a HMR, assumption tests were conducted to include: multivariate normality, homoscedasticity, linearity, outliers, multicollinearity. Multivariate normality refers to the shape of the distribution and can be evaluated using statistical or graphic representation of the data in a histogram and the P-P Plot (Rovai et al, 2013). Homoscedasticity is the variability of two continuous variables are roughly the same across all values. This assumption is met when residual values vary randomly around zero with no symmetrical pattern exists on either a scatterplot or a box plot (Rovai et al, 2013). Linearity is the approximate straight line relationship between two continuous variables to with nonlinearity normally detected using a scatterplot. Box plots will be used to test for outliers for the criterion variable – student effort (Rovai et al, 2013) The phenomenon of multicollinearity "occurs when variables are very highly correlated ($r = .9$ or above), and singularity occurs when the variables are perfectly correlated ($r = 1.00$)" (Rovai et al, 2013, p. 222). Variance Inflation Factor (VIF) is an effective tool in SPSS for detecting multicollinearity and is used this this study.

For this study the standard alpha level of 0.05 or 95% confidence interval commonly used in education research was used when testing significance of each individual's responses as well as the standard convention for statistical power of 0.8 or 80% (Cohen, 1992; Gall et al., 2007; Howell, 2011; Rovai et al., 2013) and a larger sample size ($>N=50$) sought (Green, 1991).

CHAPTER FOUR: FINDINGS

Introduction

This chapter is the results and a summary of the Technical College Student Motivation Survey (TCSMS) data for the analysis of the research questions and provides a detailed description of the data relating to the research hypotheses. The purpose of this predictive correlational study was to look at what motivates technical college degree students in their core academic courses, using the factors of expectancy and valence in expectancy theory to operationalize student effort to achieve a higher grade.

Descriptive Statistics

The study included $N = 71$ students who were enrolled in one of the 37 associated degree programs at a technical college in the Middle Georgia region. Each of the 37 degree programs fell under one of five divisions: (a) Aerospace, Trade, and Industry (ATI; n = 10 students, 14%); (b) Business and Computer Technologies (BTI; 18 students, 25%) ; (c) Health Sciences (HS; 20 students, 28%); (d) Public Safety and Professional Services (PS; 18 students, 25%); and (e) Technical Studies (TS; 5 students, 7%). No other demographic or descriptive data was collected for the students. Each of the $N = 71$ students completed $N = 24$ scenarios of the TCSMS instrument. The results obtained for the 24 scenarios for each student were used to derive 71 hierarchical regression models, one model for each student. The within-persons approach is the only methodologically sound way of looking at statistical significance in the correlation of each participant/student's 24 responses when using Vroom's expectancy theory for viewing motivation. The information obtained from the hierarchical regression models addressed Research Questions 1 and 2.

Results

Assumption Tests

A HMR was used to test all hypotheses of research questions in this study. For this correlational study, using a HMR, assumption tests were conducted to include: multivariate normality, homoscedasticity, linearity, outliers, and multicollinearity.

Following Geiger and Cooper (1996), only students with complete records for all 24 scenarios of the TCSMS were included in the study. None of the records were missing data.

Normality for the scores of the criterion/dependent variable of student effort was investigated with SPSS Explore. The Kolmogorov-Smirnov test (K-S) and Shapiro Wilks test (S-W) for normality indicated that normality was violated for the variable of student effort for all of the students' records combined (1,704 records), with p-values of $< .0005$ for both the K-S test and S-W tests. The K-S and S-W tests are sensitive to larger sample sizes ($N > 50$), and significant findings are often noted for the normality tests even when the distributions appear normal with visual inspection (Pallant, 2007). Further checks for normality were performed via a visual check of histograms and Normal Q-Q plots for the student effort variable. The histogram indicated moderate left skew. However, the values for skewness were small (skew = -0.663, $SE = .059$). A value for skewness below an absolute value of 2 is usually acceptable for determining symmetry, a requirement for a normal distribution and shows the data as tenable for analysis (Pallant, 2007; Rovai et al, 2013). The Normal Q-Q plot indicated that the data lined up along the 45-degree line from the origin, an indication that the data was not compromised by violations from normality. The mean value for student effort was $M = 7.68$ ($SE = 0.07$) which was very close in value to the median score of $Mdn = 8.0$. The median is the true center point of the data. Therefore, since the mean and median for student effort were close in value, it was

determined that the assumption of normality was met. Checks of normality for the student effort

variable were not performed for each of the $N = 71$ student regression sets, because the Central

Limit Theorem states that the sampling distribution of any statistic will be normal, or close to

normal, as the sample size gets larger (Tabachnick & Fidell, 2007, p.78). This allowed for the

assumption of normality on criterion of student effort for the $N = 71$ individual regression

models. Therefore, the assumption of normality was assumed and the parametric tests of

hierarchical linear regression were used during inferential analysis.

Assumptions of linearity between study variables and homoscedasticity of residuals for

the 71 individual regression models were checked with scatter and residual plots of the data. The

assumptions of linearity and homoscedasticity met (Field, 2005, p. 341).

Outliers in a dataset have the potential to distort results of an inferential analysis (Rovai

et al., 2013). A check of box plots for the criterion/dependent variable of student effort was

performed to visually inspect for outliers. Outliers were not noted for all of the records

combined (1,704 records). The 24 measurements for student effort were investigated for each of

the $N = 71$ students. Outliers were noted for 16 students. However, all of the outliers were

within the range of 1 to 11, which was the possible range of values for the student effort variable.

Hierarchical regression are robust to outliers if other assumptions, especially assumptions related

to variability, are met. Therefore, since no outliers were noted for the student effort variable

across all students, and the outlying values for individual students were within the acceptable

score range for student effort (between the values of 1 and 11), no records were removed from

analysis and the outlier assumption was assumed met.

The assumption test for multicollinearity was checked in this analysis using Variance

Inflation Factor (VIF) in SPSS with both predictors with values less than 10 indicating low

multicollinearity (Rovai et al., 2013).

Null Hypothesis One

H_01 – There is no statistically significant correlation between a student's belief that a higher grade can be achieved (expectancy score) combined with the desire for that grade (valence score) to a student's academic effort (effort score) to attain that grade.

A replication of the HMR modeling structure of the Geiger and Cooper (1996) was performed to test and make inferences for Research Questions 1. A HMR was performed for each of the $N = 71$ students, using the information obtained from his or her $N = 24$ TCSMS scenarios. Using the within-persons approach in the analysis on each individual separately, multiple regression with student effort were regressed onto the additive terms of valence and expectancy was modeled in Block 1, and the multiplicative term of valence X expectancy was entered into Block 2. The hierarchical regression tested if students preferred the additive or multiplicative model for Hypothesis 1. The interaction effect at the second Block of the regression was used to compare additive (Block 1) and multiplicative (Block 2) models of Vroom's force equation. If the interaction term of Block 2 returned a statistically significant R^2 change from the Block 1 model, then those students were classified as multiplicative processors, and the other students (not a sig. R^2 change) were classified as additive processors. Assumptions for the hierarchical regression model were checked and reported under the Assumption Tests heading of this section. All assumptions were assumed met for the hierarchical regression models. Table 6 presents a summary of the model results and decision making classification for each of the $N = 71$ students. Table 5 presents a summary table of the mean values, standard deviations, and ranges for the adjusted R^2 values and squared semi-partial correlation coefficients for the regression models of all $N = 71$ students combined.

Fifty-five students (77.5%) were classified as additive decision makers, six students (8.5%) were classified as multiplicative decision makers, and the regression models of 10 students (14.1%) were not statistically significant for either the additive or multiplicative model. The average increase in the adjusted R2 value from Block 1 to Block 2 was only .02, which indicated that the students who were classified as multiplicative decision makers contributed on average only 2% more to the student effort criterion (see Table 6). These findings of a minimal increase in the adjusted R^2 are consistent with findings of previous research (Butler & Womer, 1985; Geiger & Cooper, 1996; Harrell et al., 1985; Rynes & Lawler, 1983; Snead, 1991; Stahl & Harrell, 1981).

Conclusion for H_01. Mirroring the analysis method for hypothesis testing in Geiger and Cooper (1996) Hypothesis 2 this study after regression analysis found that of the 61 significant (p<.05) models, 6 used the multiplicative processing model and 55 used the more parsimonious additive process. Therefore, Vroom's (1964) expectancy theory in either process appears to adequately captured students motivational effort levels used to evaluate Hypothesis 1 in this study as the mean adjusted R^2 =.66 (N=61) in this study compared to adjusted R^2=.69 (N=81) in Geiger and Cooper's (1996) study. There is sufficient evidence to indicate a statistically significant correlation between a student's belief that a higher grade can be achieved (expectancy) and the desire for that grade (valence), which results in that student's academic effort (motivational force) to attain that grade (see Table 5). These collective results support rejecting the H_01 that there is no statistical correlation.

Table 5

Aggregate Regression Results from the Model Hierarchical Regression

Findings for Students with Significant Regression Models ($N = 61$)

Step/Statistic	Mean	Standard Deviation	Range Min.	Max.
R^2 (adj)	.66	.19	.26	.98
Valence	.325	.29	.00	.98
Expectancy	.324	.29	.00	.94

Valence = Squared semi-partial correlation coefficient for unique contribution of valence to student effort. Expectancy = Squared semi-partial correlation coefficient for unique contribution of expectancy to student effort.

Table 6

Individual Hierarchical Regression Results for Students' Hierarchical Regression Models (N = 71)

Subject	R^2 for Block 1 $F_i(V_j, E_{ij})$[a]	p (Block 1)	R^2 Change for Block 2 $F_i(V_jE_{ij} \times V_jE_{ij})$[b]	p (R^2 Change)	Approach Used by Subject
4	.671	<.0005	.025	.212	Additive
5	.980	<.0005	<.0005	.726	Additive
6	.866	<.0005	.001	.736	Additive
7	.557	<.0005	.004	.671	Additive
8	.648	<.0005	.004	.624	Additive
9	.735	<.0005	.007	.490	Additive
10	.311	.020	.007	.663	Additive
11	.315	.019	<.0005	.959	Additive
12	.417	.003	.006	.647	Additive
14	.239	.057	.095	.106	Not Significant
16	.626	<.0005	.068	.048	Multiplicative
18	.858	<.0005	.017	.118	Additive
21	.780	<.0005	.001	.796	Additive
22	.928	<.0005	<.0005	.985	Additive
24	.837	<.0005	<.0005	.947	Additive
25	.792	<.0005	.011	.312	Additive
26	.448	.002	.002	.792	Additive
27	.048	.595	.140	.078	Not Significant
29	.484	.001	.004	.685	Additive
30	.026	.756	.014	.595	Not Significant
31	.939	<.0005	.004	.252	Additive
33	.873	<.0005	<.0005	.963	Additive
34	.066	.490	.001	.887	Not Significant
35	.055	.566	<.0005	.930	Not Significant
37	.914	<.0005	.005	.295	Additive
38	.147	.188	.040	.334	Not Significant
41	.020	.811	.011	.645	Not Significant
42	.640	<.0005	.078	.029	Multiplicative
44	.211	.083	.007	.688	Not Significant
45	.451	.002	.073	.096	Additive
52	.636	<.0005	.058	.066	Additive
54	.789	<.0005	.001	.755	Additive
55	.807	<.0005	.001	.809	Additive
58	.264	.040	.032	.353	Additive
59	.940	<.0005	.003	.315	Additive
60	.817	<.0005	.006	.417	Additive

Table 6 (cont'd)

Subject	R^2 for Block 1 $F_i(V_j, E_{ij})^a$	p (Block 1)	R^2 Change for Block 2 $F_i(V_jE_{ij} \text{ X } V_jE_{ij})^b$	p (R^2 Change)	Approach Used by Subject
61	.628	<.0005	.045	.112	Additive
62	.660	<.0005	.003	.658	Additive
63	.480	.001	.004	.686	Additive
64	.275	.034	.083	.123	Additive
65	.647	<.0005	.020	.284	Additive
68	.619	<.0005	.016	.362	Additive
69	.856	<.0005	.002	.573	Additive
70	.698	<.0005	.009	.438	Additive
72	.244	.061	.001	.902	Not Significant
73	.524	<.0005	.002	.784	Additive
76	.796	<.0005	<.0005	.908	Additive
77	.783	<.0005	.029	.097	Additive
81	.662	<.0005	.002	.712	Additive
83	.839	<.0005	.024	.075	Additive
84	.647	<.0005	.016	.361	Additive
85	.871	<.0005	.029	.025	Multiplicative
87	.282	.031	.045	.262	Additive
88	.669	<.0005	.012	.401	Additive
89	.669	<.0005	.108	.006	Multiplicative
90	.287	.029	<.0005	.939	Additive
91	.566	<.0005	.040	.171	Additive
92	.574	<.0005	.133	.007	Multiplicative
93	.721	<.0005	.009	.445	Additive
94	.300	.024	.056	.204	Additive
95	.661	<.0005	.002	.752	Additive
96	.117	.270	.004	.760	Not Significant
97	.787	<.0005	.004	.569	Additive
98	.522	.001	.028	.295	Additive
99	.713	<.0005	.115	.002	Multiplicative
101	.764	<.0005	.002	.666	Additive
103	.710	<.0005	<.0005	.937	Additive
109	.825	<.0005	.011	.268	Additive
111	.601	<.0005	.003	.686	Additive
112	.882	<.0005	.009	.224	Additive

[a] Block 1 in the hierarchical regressions modeled F_i on V_j and E_{ij}, where F_i is Effort, V_j is Valence, and E_{ij} is expectancy. For Block 1, $df = (2,21)$.[b]
Block 2 in the hierarchical regressions modeled F_i on the interaction of $V_j \text{ X } E_{ij}$, after controlling for V_j and E_{ij} which were added as separate terms in Block 1. For Block 2, $df = (3,20)$.

Null Hypothesis Two

H_02 – A student's desire for a higher grade (valence) does not have a greater contribution to motivational effort than expectancy.

A replication of the HMR modeling structure of the study by Geiger and Cooper (1996), was performed to test and make inferences for Research Questions 1 and 2. A HMR was performed for each of the $N = 71$ students, using the information obtained from his or her $N = 24$ case study scenarios of the TCSMS. Student effort was regressed onto the additive terms of valence and expectancy in Block 1, and the multiplicative term of valence X expectancy was entered into Block 2. Only the Block 1 results (the additive model) were compared to address Research Question 1.

If both predictors were significant (p<.05) for the regression results of a student, then the squared semi-partial correlation coefficients for each of the predictor variables of Valence and Expectancy were compared to assess the unique contribution of each variable to variance in the student effort outcome. The semi-partial correlation coefficient for the predictor variable valence was .33. Assumptions for the hierarchical regression model were checked and reported under the Assumption Tests heading of this section. All assumptions were assumed met for the hierarchical regression models.

As noted in the results for Null Hypothesis 1, 10 students did not have significant regression models for either Block 1 or Block 2. The Block 1 regression findings for the remaining 61 students (those who had significant regression models) were investigated to see if valence or expectancy contributed more to the student effort criterion. Of the n = 61 students, 29 students (47.5%) had a greater contribution of valence towards the outcome of effort, and 32 students (52.5%) had a greater contribution of expectancy towards the outcome of effort. The

difference in the mean values of the squared semi-partial correlation coefficients for valence and expectancy of .325 and .324 respectively, were almost equal in value. This indicated that on average, valence only contributed 1% more of unique variability to the criterion of student effort. Additionally a paired samples t-test was performed on the squared semi partial correlation coefficients Block 1 of the $N = 61$ significant regression models, to compare the mean values of the squared semi partial correlation coefficients for the variables of Valence ($M = .324$, $SD = .32$) vs. Expectancy ($M = .325$ $SD = .36$). Results were not statistically significant $t(60) = 0.07$, $p = .941$. The non-significant findings indicate that the mean difference between the two sets of squared semi partial correlation coefficients was not different from zero.

Conclusion for $H_0 2$. Results of the paired samples t-test indicated that the difference between the mean squared semi partial correlation coefficients of Valence and Expectancy did not differ from zero. Therefore do not reject Null Hypothesis 2. There is not sufficient evidence to conclude that a student's desire for a higher grade (valence) has a greater contribution to motivational effort than expectancy.

Summary

The purpose of this predictive correlational study was to look at what motivates technical college degree students in their core academic courses using the factors of expectancy and valence in expectancy theory to operationalize student effort to achieve a higher grade. This chapter presents the results of the analysis of the data gathered, looking at the statistical correlations and the linear relationship between expectancy and valence with respect to student's academic effort or motivational force ($H_0 1$); whether valence ($H_o 2$) and expectancy, as predictor variables, can predict effort levels of motivation in technical college degree students.

The results of the correlational study indicated that when it comes to achieving a higher

grade, 77.5% of the $N = 61$ students were classified as additive decision makers. Also, in keeping with previous research, those students who were classified as multiplicative (8.5%) only contributed a small amount more (2%) to the adjusted R^2 value over the additive model. Additionally, the contribution of valence and expectancy to the criterion of student effort in the additive model were almost equal, with valence contributing an average of 33% of unique variance and expectancy contributing an average of 32% of unique variance to the student effort criterion.

Chapter 5 will present a discussion of the findings from this chapter as relates to the theoretical framework, problem statement, and literature. Implications for further research and limitations to the study will also be presented and discussed.

CHAPTER FIVE: DISCUSSION

Introduction

This chapter contains a summary of findings, a discussion of the findings, limitations of the study, implications, and recommendations for future research.

The purpose of this predictive correlational study was to look at what motivates technical college degree students in their core academic courses, using the factors of expectancy and valence in expectancy theory to operationalize student effort to achieve a higher grade.

Findings

The first finding of this study was that there is a statistical correlation ($p<.05$) between a student's desire or want (valence) for a goal or set of goals and the expectation of success (expectancy) that the individual has toward attaining those goals with regard to effort toward a higher grade in a core academic class. Through the use of the HMR models for each of the 71 participants' responses used, the study found that most students in the technical college core academic classes exercise the additive process when deciding to put forth effort toward a higher grade over the multiplicative process originally posited by Vroom (1964, 1995) in expectancy theory. This answers the first research question (RQ#1), "Is there a statistically significant correlation between a student's belief that a higher grade can be achieved (expectancy score) combined with the desire for that grade (valence score) to a student's academic effort (effort score) to attain that grade?"

The second finding (also from the HMR models) was that, although there is a relatively strong correlation between the valence and expectancy (adjusted $R^2 =.66$) on the technical college student's motivation to put forth a level of effort, neither one of those factors is statistically prevalent. Table 6 is a summary of the findings.

Table 7

Summary of Findings

Research Question	Null Hypothesis	Hypothesis Test Results
RQ#1 – Is there a statistically significant correlation between a student's belief that a higher grade can be achieved (expectancy score) combined with the desire for that grade (valence score) to a student's academic effort (effort score) to attain that grade?	**H₀1** – There is no statistically significant correlation between a student's belief that a higher grade can be achieved (expectancy score) combined with the desire for that grade (valence score) to a student's academic effort (effort score) to attain that grade.	Reject the Null Hypothesis Adjusted R^2 = .66, p<.05 (*N*=61)
RQ#2 – Does a student's desire for a higher grade (valence) have a greater contribution to motivational effort than expectancy?	**H₀2** – A student's desire for a higher grade (valence) does not have a greater contribution to motivational effort than expectancy.	Fail to Reject the Null Hypothesis Mean squared semi-partial correlation coefficient for Valence=.325

Discussion of the Findings

It was the purpose of this predictive correlational study to examine the motivation of technical college students in their core academic classes to attain a higher grade. This section covers three major findings of this study: (a) There is a statistical correlation (p<.05) between a student's desire or want (valence) for a goal or set of goals and the expectancy of success (expectancy) that the individual has toward attaining those goals with regard to effort toward a higher grade in a core academic class; (b) There is no predominant predictor between the two factors – valence or expectancy – that motivate an individual to put forth effort.

This predictive correlational design in this study regarding the one research question and subsequent two sub-questions sought to replicate the research study of Geiger and Cooper (1996)

with a sample population of university accounting students in the United States that used

Vroom's expectancy theory to explore student motivation. This study used a modification of the

instrument used in the study by Geiger and Cooper (1996) that operationalized the factors of

valence, expectancy, and effort using an online survey format via *SurveyMonkey*. It is important

to point out that expectancy theory (Vroom, 1964) in the early years of development assumed a

multiplicative process with regards to valence and expectancy as predictors on the effort level of

a student. Most studies since have found that more often than not an additive process is used,

with only a small number of students choosing the multiplicative process (Campbell et al., 2003;

Geiger & Cooper, 1996; Geiger et al., 1998; Harrell & Stahl,1983; Harrell et al., 1985). It is

important to point out why this is important to the study. In this study, 77.5% of the students

analyzed used the additive, 8.5% used a multiplicative process, and 14.1% were not significant

as either in deciding whether or not they would put forth effort to get a higher grade in a core

academic course. This means that for most technical college degree students, a valence or

expectancy level of zero does not mean zero effort level. Important to these findings is that

expectancy theory in either additive or multiplicative form is a useful tool for predicting

technical college student motivation toward effort in their core academic classes.

The first finding of this study is that there is a statistical correlation ($p<.05$) between a

student's desire or want (valence) for a goal or set of goals and the expectation of success

(expectancy) that the individual has toward attaining those goals with regard to effort toward a

higher grade in a core academic class. This finding is consistent with the findings of Geiger et

al. (1998) with a mean adjusted $R^2 = .72$ ($N = 637$) and Geiger and Cooper (1996) with a mean

adjusted $R^2 = .69$ ($N = 81$) looking at university-level accounting students with significant

regression models. This compares to the mean adjusted $R^2 = .66$ for the 61 technical college

degree students with significant regression models in this study and a closer correlation to the

Geiger and Cooper (1996) study for the students that used the more parsimonious additive model

(N=61) with adjusted R^2 = .66. For practical purposes, adjusted R^2 is the percentage of variation

explained by only the predictors – valence and expectancy – that actually affect the effort levels.

This implies that for the 71 technical college degree students sampled with significant regression

models, valence and expectancy account for 66% of the contribution to the effort level decision

to attain a higher grade in their core academic classes. This is an important point for educators in

technical education to know that the students' desire for their goals and their belief that they can

get the grade that leads to those goals attributes significantly to student success.

The second finding is that valence is not the predominant predictor between the two

factors –valence or expectancy – that motivate an individual to put forth effort. This study used

the squared semi-partial coefficients (.33 and .32 respectively) to look at the unique contribution

of each factor on effort scores and found that neither valence nor expectancy showed

predominance over the other as a greater contributor to student motivational effort. This finding

differs from that of Geiger and Cooper (1996) in accounting students with valence (β=.64) being

the greater contributor to of effort levels over expectancy (β=.41) to attain a higher grade.

<div align="center">**Limitations**</div>

This predictive correlational design makes every effort to limit threats to internal and

external validity. Three limitations are noted with the first two limitations addressing internal

validity, instrumentation internal validity and self-reporting and one limitation external validity

and that is the issue of population validity.

The first limitation is the issue of instrumentation internal validity of the survey

instrument – Technical College Student Motivation Survey (TCSMS). The greatest threat to

internal validity is the possibility that the instrument is too difficult to understand or complex in nature. Though this instrument has been very reliable in research with university and college accounting students, it is possible that it might not be suitable in its current form in technical college student research. This survey instrument is a modification of that used in prior studies (Campbell et al., 2003; Geiger & Cooper, 1996; Geiger et al., 1998; Harrell et al., 1985) with great utility for operationalizing the factors of motivation in expectancy theory. The minimum sample size for this study was 50 respondents, and the TCSMS provided 71 complete responses, each providing 24 statistically significant regression data for regression analysis. A total of 112 surveys were registered as started of which only 71 respondents provided complete data for a correlational study and following Geiger and Cooper's design and analysis methods only records with complete data were used. To control for instrumentation internal validity, every effort was made to administer the online survey in a face-to-face format during class time to assist if any of the students had difficulty with the survey. Prior to any participant taking the survey, this researcher briefed the potential participants on the nature of the study and the layout and logic of the survey instrument. The 24 case studies that make up the survey were randomized in SurveyMonkey to minimize the internal validity issue of response bias. The Cronbach's alpha coefficients for internal consistency reliability of the TCSMS with the data collected in this study ($N = 71$ students) were .902 and .884 for the valence scores and student effort scores respectively. Rovai et al. (2013) noted that a reliability coefficient of .70 or higher is considered acceptable in most social science research situations.

The second limitation is the use of a survey as a self-report measure for operationalizing the values to be analyzed in the study. Rovai et al. (2013) note that self-reporting measurement is the least accurate and most unreliable yet remains the most common form of measure used in

social science research.

A third limitation to this study is that of population validity. Using the frame of 1,916 degree students at the technical college, a cluster random sample (probability sample) of four college algebra and four degree-level English classes were selected at random from which survey data was received. Rovai et al. (2013) point out that external validity could be an issue if the proper number of clusters, classes in this case, is not selected. The target population for this study is the degree student enrolled in a technical college, and all students surveyed met that criterion. The survey was administered without regards to gender, ethnicity, age or any other specific demographic, as the study was not framed to look at those aggregate groups. The sample population was selected from one technical college in the middle of the state of Georgia in the United States, and a threat to population validity exists in that the findings may not be generalizable to all technical college students.

Implications

The implications of this study are considered in three areas: theoretical implications, implications for technical college educators, and implications for technical college degree students.

The theoretical implications of this study are that Vroom's expectancy theory can be an effective theoretical framework to use in exploring student motivation within the technical college community. The findings in this study echo Gyurko's (2011) assertion, though geared toward nursing educators, that Vroom's fairly simple model can help researchers in education predict factors that make the technical education process more successful for adult learners. Little research is available exploring the motivation of technical college degree students, though enrollment numbers are increasing due to a struggling economy. This study supports the notion,

using empirical methods, that technical college students are motivated by the traditional achievement goals: (a) higher GPA, (b) increased knowledge toward a future job, and (c) greater self-satisfaction.

Another related implication is that students do have an attraction to goals (valence) and the resultant effort that someone is willing to put forth depending on the strength of that attraction. The predominance of valence as a key component of motivation in this study differs to the findings of studies of university students, both in the United States (Geiger & Cooper, 1996) and abroad (Campbell et al., 2003; Geiger et al., 1998) that the attraction to a goal or combination of goals plays a greater part in motivation than does the expectancy of success for attaining that goal. This study did not find the same associate between the two variables.

One implication for technical college educators from the findings in this study are that instructors can better motivate students by aligning the lessons and curricula to goals related to the field of study of the particular student. One way that this can be accomplished is by providing the students that are in core academic classes with application exercises that use the competencies in that class to the individual field or program of study of the student. For example, assume that student in the Aerospace, Trade, and Industry degree division is in the Electronics Technology program of study and he or she is enrolled in a college degree-level algebra class. The instructor can hand out workbooks developed by the Electronics Technology program faculty allowing the student to use and see relevance of the competencies in the core academic classes. As the student sees success in attaining the core academic competencies, a strengthening of the attraction (valence) to the field of study may occur while at the same time showing the student that higher grades in the process are attainable (expectancy).

The implications for the technical college students of this study focus on providing

students with everyday reminders in the core academic classrooms that keep students focused on their goals with things that point them to those goals increasing the desire to learn the material in the class to better attain those goals. All student are in a technical college classroom is given a syllabus and course materials where the students can see clear-cut steps to attaining a good grade and improving the belief that they can achieve the higher grade. This is more than just encouragement to be nice; it is encouragement as a tool to increase motivation of the student to succeed in their applicable program based on the findings of this study. One could image an English instructor at a technical college having a CEO of a local company known for hiring degree students that have graduated from this particular college telling the class the virtues of proper sentence structure. This study implies that there is a high probability that it would improve the effort levels in that class. The bottom line is that the most important person in the technical college is the student. Better understanding what factors motivate him or her to try harder to make better grades in the required degree core classes will only improve the chance for success.

Recommendations for Future Research

Future research is needed using the Valence Model of Vroom's (1964, 1995) Expectancy Theory looking at what achievement goals or combination of goals best motivate the technical college student to greater effort levels. This study found that technical college students are attracted to the three traditional achievement goals: a higher GPA, better knowledge for a future job, and greater self-satisfaction. Research still needs to be done looking at which one or combination of those goals best motivates by increasing the valence toward the goals. Additionally a qualitative study is needed to explore what goals the students in the technical

college say that best motivate them and aggregating the responses into learning goals and performance goals.

Research is also needed to look at effort levels across aggregate groups to include gender, age, race, ethnicity, and sexual orientation. In addition, future research is needed to break the effort level data down into the program level from the degree division. For example, the Health Science degree division is comprised of ten programs ranging from Advanced Medical Imaging to Radiologic Technology, and knowing what factors have the most impact on student motivation could be of great help to administrators, faculty, and staff associated with such programs.

A replication of this study with degree students at another technical college and with Certificate of Credit students is needed to test the generalizability of the findings in this study.

Conclusion

This predictive correlational study examined the motivation of technical college students to perform well and make an effort toward academic success as evident in pursuit of a higher grade in their core classes. Particular attention was paid to the student's belief that a higher grade can be achieved (expectancy), the desire for that grade (valence), and the contribution of these factors on student academic effort (motivational force), finding a strong correlation ($p<.05$) between the two factors. This study sought to understand better how the relationship between the motivational factors – expectancy and valence –affect student performance and perception of success in the classroom. Overall, valence and expectancy are about equal in their contribution to effort levels of the student motivation. While threats to internal validity were present, measures were taken to minimize the effect on the study. The same is true for the threat to external validity, mainly the recommendation that additional research be done at another

technical college and perhaps in another region to compare the findings and provide a greater

generalizability on technical college degree student motivation. This study was conducted with

the sole purpose of better understanding the motivation of technical college degree students.

REFERENCES

Abadi, F. E., Jalilvand, M. R., Sharif, M., Salimi, G. A., & Khanzadeh, S. A. (2011) A study of influential factors on employees' motivation for participating in the in-service training courses based on modified expectancy theory. *International Business and Management*, *2*(1), 157-169.

Abd-El-Fattah, S. M. (2011). Garrison's model of self-directed learning: Preliminary validation and relationship to academic achievement. *The Spanish Journal of Psychology*. *13*(2), 586-596.

Alderfer, C. P. (1972). *Existence, relatedness, and growth; human needs in organizational settings*. New York: Free Press.

Allport, G. W. (1954). *Handbook of social psychology*. Cambridge: Addison-Wesley.

Ary, D., Jacobs, L. C., & Razavieh, A. (2002). *Introduction to research in education*. 6th ed. Belmont, CA.: Wadsworth/Thomson Learning. p. 263

Atkinson, J. W., & Feather, N. T. (1966). *A theory of achievement motivation*. Princeton, NJ: Van Nostrand.

Bandura, A. (1977). *Social learning theory*. Englewood Cliffs, NJ: Prentice Hall.

Bandura, A. (1986). *Social foundation of thought and action*. Englewood Cliffs, NJ: Prentice-Hall.

Bandura, A. (1989) *Social Foundations of Thought and Action.* Englewood Cliffs, N.J.: Prentice Hall.

Boshier, R. (1973). A psychological study of adult education participation and dropout. *Adult Education Quarterly, 23*(4) 255-282. Retrieved from doi: 10.1177/074171367302300401

Brooks, L. & Betz, N. (1990, January). Utility of expectancy theory in predicting occupational choices in college students. *Journal of Counseling Psychology*, *37*(1), 57-64.

Campbell, S. V., Baronina, T., & Reider, B. P. (2003, May). Using expectancy theory to assess group-level differences in student motivation: A replication in the Russian Far East. *Issues in Accounting Education.* *18*(2), 125-136. Retrieved from http://dx.doi.org/10.2308/iace.2003.18.2.125.

Caulfield, J. (2007, January). What motivates students to provide feedback to teachers about teaching and learning? An expectancy theory perspective. *International Journal for the Scholarship of Teaching and Learning. 1*(1).

Coch, L., & French, J. R. (1978). *Overcoming resistance to change.* Rochelle Park, NJ: Hadyn Book Company.

Cohen, J. (1988). *Statistical power analysis for the behavioral sciences*. Hillsdale, NJ: Lawrence Erlbaum Associates.

Cohen, J. (1992). A power primer. *Psychological Bulletin. 112*(1).

Colquitt, J., LePine, J., & Noe, R. (2000). Toward and integrative theory of training motivation: A meta-analytic path analysis of 20 years of research. *Journal of Applied Psychology. 85*(5), 678-707.

Conyers, A. J. (2004). *The meaning of vocation*. The Center for Christian Ethics at Baylor University. Retrieved from http://www.baylor.edu/ifl/christianreflection/VocationarticleConyers.pdf

Courtney, S. (1992). *Why adults learn: towards a theory of participation in adult education*. London: Routledge.

Cowdery, K. M. (1926) Measurements of professional attitudes: Differences between lawyers, physicians, and engineers. *Journal of Personnel Research. 5*, 131-141.

Cross, K. P. (1981). *Adults as learners*. San Francisco: Jossey-Bass.

Daehlen, M., & Ure, O. B. (2009, September-October). Low-skilled adults in formal continuing education: Does their motivation differ from other learners? *International Journal of Lifelong Education*, *28*(3), 661-674.

Dalton, M., Hoyle, D. G., & Watts, M. W. (2010). *Human relations* (4th ed.). Houston, TX: Cengage Learning.

Dalton, B., Lauff, E., Henke, R., Alt, M., & Li, X. (2013, February). *From track to field: Trends in career and technical education across three decades: Prepared for the National Assessment of Career and Technical Education (NACTE)*. Submitted to the U.S. Department of Education, Policy and Program Studies Service. Research Triangle Park, NC: RTI International. Retrieved from http://www.rti.org/publications/abstract.cfm?pubid=20738.

Darkenwald, G. G., & Merriam, S. B. (1982). *Adult education: Foundations of practice*. New York: Harper Collins.

Deci, E. L., Ryan, R. M., & Guay, F. (2013). Self-determination theory and actualization of human potential. In D. McInerney, H. Marsh, R. Craven, & F. Guay (Eds.), *Theory driving research: New wave perspectives on self-processes and human development* (pp. 109-133). Charlotte, NC: Information Age Press. Retrieved from http://www.selfdeterminationtheory.org/authors/edward-deci

Driscoll, M. P. (2000). *Psychology of learning for instruction* (2nd ed.). Boston: Allyn and Bacon.

Dweck, C., & Leggett, E. (1988). A social-cognitive approach to motivation and personality. *Psychology Review*, *95*, 256-273.

Estes, B., & Polnick, B. (2012). Examining motivation theory in higher education: An expectancy theory analysis of tenured faculty productivity. *International Journal of Management, Business, and Administration. 15*(1), 1-7.

Farmer, L. S. J. (2011). How adults learn through information. In Wang, V. X. (2011) *Encyclopedia of Information Communication Technologies and Adult Education Integration. Information Science Reference*. Retrieved on November 27, 2012 from http://web.ebscohost.com.proxygsu-mgat.galileo.usg.edu/ehost/ebookviewer/ebook/nlebk_329139_AN?sid=82ed6d9a-8581-4ad5-8875-42fa9be846d7@sessionmgr12&vid=3

Field, A. P. (2005). Discovering statistics using SPSS (2nd edition). London: Sage.

Fingeret, H. A., & Drennon, C. (1997). *Literacy for life: adult learners, new practices*. New York: Teachers College Press.

Fryer, D. (1931). *The measurement of interests in relation to human adjustment*. Troy, MI: Holt, Rinehart & Winston.

Gall, M., Gall, J., & Borg, W. (2007). *Educational research: an introduction*. Boston, MA: Allyn and Bacon.

Gay, L. R. & Airasian, P. (2000). *Educational research: Competencies for analysis and applications* (6th ed.). Upper Saddle River, NJ: Merrill Prentice Hall.

Gegenfurtner, A., Fesner, D., & Gruber, H. (2009, September). Motivation to transfer: An integrative literature review. *Human Resources Development Review*, *8*(3), 403-423. doi:10.1177/1534484309335970

Geiger, M. A., & Cooper, E. A. (1996). Cross-cultural comparisons – Using Expectancy Theory to assess student motivation. *Issues in Accounting Education*, 11, 113-129.

Geiger, M. A., Cooper, E. A., Hussain, I., O'Connell, B. T., Power, J., Raghunandan, K., Rama, D. V., & Sanchez, G. (1998, February). Cross-cultural comparisons – Using expectancy theory to assess student motivation: An international replication. *Issues in Accounting Education*, *13*(1).

Green, S. B. (1991). *Multivariate behavioral research*, *26* (3), 502-503.

Gyurko, C. C. (2011). A synthesis of Vroom's model with other social theories: An application to nursing education. *Nurse Education Today*, *31*, 506-510.

Halvari, H., & Skjesol Bagoein, T. E. (2011). Motivational climates, achievement goals, and physical education outcomes: A longitudinal test of achievement goal theory. *Scandinavian Journal of Educational Research*, *55*(1), 79-104 retrieved from http://web.ebscohost.com/ehost/pdfviewer/pdfviewer?sid=6fcbabbf-699b-4661-91e2-15aa1e5cce40%40sessionmgr115&vid=6&hid=125

Harmer, J. (1983). *The practice of English language teaching*. London: Longman.

Harrell, A., & Stahl, M. (1983). Need for achievement, need for affiliation and the academic performance and career intentions of accounting students. *Journal of Accounting Education*, 149-153.

Harrell, A., Caldwell C. & Doty, E. (1985, October). Expectancy theory predictions of accounting students' motivation to achieve academic success. *The Accounting Review*, 724-735.

Hayamizu, T., & Weiner, B. (1991). A test of Dweck's Model of Achievement Goals as related to perceptions of ability. *Journal of Experimental Education*, *59*, 226-234.

Henry, G. T., & Basile, K. C. (1994). Understanding the decision to participate in adult education. *Adult Education Quarterly*. *44*(2) 64-82.

Herzberg, F. (1959). *The motivation to work* (2nd ed.). New York: Wiley.

Hobson, P. (2002). *The cradle of thought: Exploring the origins of thinking.* London: Macmillan.

Houle, C. O. (1961). *The inquiring mind*. Madison: University of Wisconsin Press.

Howell, D. (2011) *Fundamental statistics for the behavioral sciences*, (7th ed.). Belmont, CA: Wadsworth Cengage Learning.

Hsieh, Y., Hwang, G., & Liu, G. (2003). A case study in the investigation for the connections of affecting students' learning attitudes. *Journal of National Huwei Institute of Technology*. *6*, 99-110.

Hull, C. L. (1943). *Principles of behavior, an introduction to behavior theory*. New York, London: D. Appleton-Century Company, Inc.

Hull, C. L. (1951). *Essentials of behavior*. New Haven: Published for the Institute of Human Relations by Yale University Press.

Jadidian, A., & Duffy, R. D. (2012). Work volition, career decision self-efficacy, and academic satisfaction: An examination of mediators and moderators. *Journal of Career Assessment*, *20*(2), 154-165.

Kanar, C. C. (2011). *The confident student.* (7th ed.). Boston: Wadsworth, Cengage Learning.

Keller, J. M. (1983). *Development and use of the ARCS model of motivational design*. Enschede: TH Twente, Toegepaste Onderwijskunde.

Kitson, H. D. (1930). Investigation into vocational interests among workers. *Psychological Clinics*. *19*, 48-52.

Knowles, M. S. (1984). *The adult learner: A neglected species*. (3rd ed.). Houston: Gulf.

Kopelman, R. E. (1977). A casual-correlational test of the Porter and Lawler framework. *Academy of Management Proceedings*, 76-80.

Kuder, G. F. (1946). *Revised manual for the Kuder Preference Record.* Chicago: Science Research Associates.

Kusurkar, R.A., Ten Cate, Th. J., Van Asperen, M., & Croiset, G. (2011). Motivation as a predictor variable and a criterion variable in medical education: A review of the literature. *Medical Teacher*, 33, e242-e262. Retrieved from http://informahealthcare.com/doi/pdf/10.3109/0142159X.2011.595435

Lawler, E. E. (1973). *Motivation in work organizations*. Monterey, CA: Brooks/Cole Pub. Co.

Lewin, K., & Cartwright, D. (1951). *Field theory in social science: selected theoretical papers*. New York: Harper & Brothers.

Liao, H. C., & Wang, Y. (2008). Applying the ARCS motivation model in technological and vocational education. *Contemporary Issues in Education Research*. *1*(2), 53-58.

Lunenburg, F. C. (2011). Expectancy theory of motivation: Motivating by altering expectations. *International Journal of Management, Business, and Administration*. *15*(1) 1-6.

Macaskill, A., & Taylor, E. (2010). The development of a brief measure of learner autonomy in university students, *Studies in Higher Education, 35*(3), 351-359.

Maier, N. F. R. (1955). *Psychology in industry*. Boston: Houghton Mifflin.

Marcus, J. (2013, April 26). Community-college grads out-earn bachelor's degree holders. *The Hechinger Report*. Retrieved from http://hechingerreport.org/content/community-college-grads-out-earn-bachelors-degree-holders_11261/

Mathieu, J. E., & Martineau, J. W. (1997). Individual and situational influences in training motivation. In: Ford, J. K., Kozlowski, S. W. J., Kraiger, K., Salas, E. & Geachout, M. S. (Eds.). *Improving Training Effectiveness in Organizations*. Hillsdale, NJ: Erlbaum, pp. 193–222.

Maslow, A. H. (1970). *Motivation and personality* (2nd ed.). New York: Harper & Row.

McClelland, D. C. (1953). *The achievement motive,* New York: Appleton-Century-Crofts.

Merriam, S. B., & Caffarella, R. S. (1999). *Learning in adulthood. A comprehensive guide.* (2nd ed.). San Francisco: Jossey-Bass Publishers.

Miller, H. L. (1967) *Participation of adults in education: A force-field analysis*. Boston: Center for the Liberal Education for Adults. Boston University.

motivation. 2011. In Merriam-Webster.com. Retrieved October 31, 2012, from http://www.merriam-webster.com/dictionary/motivation.

Murayama, K., & Elliot, A. J. (2009). The joint influence of personal achievement goals and classroom goal structures on achievement-related outcomes. *Journal of Educational Psychology,* 101, 432-447. Retrieved from www.psych.rochester.edu/research/apav/publications/2009.html

Nilson, L. B. (2010). *Teaching at its best – A research-based resource for college instructors.* (3rd ed.). San Francisco: Jossey-Bass.

Owens, R. G., & Valesky, T. C. (2011). *Organizational behavior in education: Leadership and school reform* (10th ed.). Boston: Pearson Education.

Pallant, J. (2010). *SPSS Survival Manual*. New York, NY: McGraw-Hill Education Publishers.

Pedhazur, E. J. (1997). *Multiple regression in behavioral research* (3rd ed.). Orlando, FL: Harcourt Brace.

Pintrich, P. R., & Schunk, D. H. (1996). *Motivation in education – Theory, research, and application*. Englewood Cliffs, NJ: Prentice Hall, Inc. 67-103.

Roe, A. (1956). *The psychology of occupation*. New York: John Wiley & Sons.

Roethlisberger, F. J., & Dickson, W. J. (1939). *Management and the workers. An account of a research program conducted by the Western Electric Company, Hawthorne Works, Chicago.* By F. J. Roethlisberger ... and W. J. Dickson ... with the assistance and collaboration of Harold A. Wright. Cambridge, Mass.: Harvard University Press.

Rovai, A. P., Baker, J. D., & Ponton, M. K. (2013) *Social science research design and statistics. A practitioner's guide to research methods and SPSS analysis* (1st ed.). Chesapeake, VA: Watertree Press LLC.

Rubenson, K. (1977). *Participation in recurrent education*. Paris: Center for Educational Research and Innovations. Organization for Economic Cooperation and Development.

Salma, G., & Sajid, M. A. (2012). Teacher's motivation and job satisfaction. International *Journal of Management Science and Business Research*. *1*(10) Retrieved from http://www.ijmsbr.com/Volume%201,%20Issue%2010%20%285%29.pdf

Sass, E. J. (1989). Motivation in the college classroom: What students tell us. *Teaching of Psychology*, *16*(2), 86-88. Retrieved from https://uteach.utexas.edu/sites/default/files /2011-02-18%20Motivating%20Reluctant%20Learners%20Handout.pdf

Shin, S., & Lee, T. J. (2011). Degree of motivation of international hospitality students in their workplace. *Journal of Hospitality, Leisure, Sports, and Tourism Education. 10*(1). doi:10.3794/johlste.101.240

Smith, R., Jayasuriya, R., Caputi, P., & Hammer, D. (2009). Exploring the role of goal theory in understanding training motivation. *International Journal of Training and Development*. *12*(1), 54-72.

Snead, K. C., & Harrell, A. M. (1991). An Application of Expectancy Theory to Explain a Manager's Intention to Use a Decision Support System. *Decision Sciences*, 499-510.

Somers, P., Haines, K., Keene, B., Bauer, J., Pfeiffer, M., McCluskey, J. et al. (2006). Toward a theory of choice for community college students. *Community College Journal of Research and Practice*. *30*, 53-67.

Stahl, M, & Harrell, A. (1981) Modeling effort decisions with behavioral decision theory: Toward an individual differences model of expectancy theory. *Organizational Behavior and Human Performance*, 27, 303-325.

Stahl, M., & Harrell, A. (1983). Using decision modeling to measure second level valences in expectancy theory. *Organizational Behavior and Human Performance*, *32*, 23-24.

Stromberg, M. W., & Nilsson, K. (2010, November 5). Nursing students' self-graded motivation to complete their programme of study. *Open Nursing Journal. 4*: 42–47. Retrieved from doi: 10.2174/1874434601004010042

Strong, E. K., Jr. (1929). A vocational interest test. *Education Research. 10*, 59-68.

Su, M. M. (2005). A study of EFL technological and vocational college students and their self-percieved English proficiency. *Electronic Journal of Foreign Language Teaching. 2*(1), 44-56.

Super, D. E. (1957). *The psychology of careers.* New York: Harper.

Svinicki, M. D. (2004). *Learning and motivation in the postsecondary classroom*. Bolton, Mass.: Anker Pub. Co.

Thorndike, E. L. (1911). *Individuality*. Boston: Houghton, Mifflin.

Thorndike, E. L., Bregman, E. O., Tilton, J. W., & Woodyard, E. (1928). *Adult learning*. New York: McMillan. Retrieved from http://books.google.com/books?id=TGF_yeO_ uhgC&q=Thorndike+adult+learning&dq=Thorndike+adult+learning&hl=en&sa=X&ei= hFKeUMHuI4eVrAHS64CYCg&ved=0CDsQ6wEwAA

Tolman, E. C. (1932). *Purposive behavior in animals and men*. New York: Century.

Tough, A. M. (1979). *The adult's learning projects: a fresh approach to theory and practice in adult learning* (2nd ed.). Austin, TX: Learning Concepts.

vocation. 2011. In Merriam-Webster.com. Retrieved October 31, 2012, from http://www.merriam-webster.com/dictionary/vocation.

Viteles, M. S. (1953). *Motivation and morale in industry* (1st ed.). New York: Norton Publishers

Vroom, V. H. (1964) *Work and motivation*. New York: Wiley.

Vroom, V. H. (1995) *Work and motivation*. New York: Wiley.

Wang, C. K. J., Liu, W. C., Koh, C., & Tan, O. S. (2011). A motivational analysis of project work in Singapore using self-determination theory. *The International Journal of Research and Review*, *7*(1), 45-66.

Weiner, M. J. (1974). Cognitive Dissonance or Self Perception, 1965-1974. *Personality and Social Psychology Bulletin*, 144-146.

Wigfield, A., & Eccles, J. S. (2000). Expectancy-value theory of achievement motivation. *Contemporary Educational Psychology. 25*, 68–81 Retrieved from doi:10.1006/ceps.1999.1015

Wlodkowski, R. (2010) *Enhancing adult motivation to learn: A comprehensive guide for teaching all adults* (3rd ed.). San Fransisco: Jossey-Bass.

Wu, C. Y. (2001) *A promising avenue of improvement in English instruction and general education curricula: An integrated curriculum and theme-based instruction*. Paper presented at the Elliot Masie's LMS Conference. Multi-vendor, Las Vegas, U.S.A.

Zaniboni, S., Fraccaroli, F., Truxillo, D. M., Bertolino, M., & Bauer, T. N. (2010). Training valence, instrumentality, and expectancy scale (T-VIES-it). Factor structure and nomological network in an Italian sample. *Journal of Workshop Learning*. *23*(2), 133-151.

APPENDICES

Appendix A: IRB Liberty University

LIBERTY UNIVERSITY.
INSTITUTIONAL REVIEW BOARD

May 20, 2014

Jeffrey C. Hoffman
IRB Exemption 1879.052014: An Analysis of Technical College Student Motivation to Pursue a Higher Grade in a Core Academic Class: A Study Using Vroom's Expectancy Theory

Dear Jeffrey,

The Liberty University Institutional Review Board has reviewed your application in accordance with the Office for Human Research Protections (OHRP) and Food and Drug Administration (FDA) regulations and finds your study to be exempt from further IRB review. This means you may begin your research with the data safeguarding methods mentioned in your approved application, and that no further IRB oversight is required.

Your study falls under exemption category 46.101 (b)(2), which identifies specific situations in which human participants research is exempt from the policy set forth in 45 CFR 46:

> (2) Research involving the use of educational tests (cognitive, diagnostic, aptitude, achievement), survey procedures, interview procedures or observation of public behavior, unless:
> (i) information obtained is recorded in such a manner that human subjects can be identified, directly or through identifiers linked to the subjects; and (ii) any disclosure of the human subjects' responses outside the research could reasonably place the subjects at risk of criminal or civil liability or be damaging to the subjects' financial standing, employability, or reputation.

Please note that this exemption only applies to your current research application, and that any changes to your protocol must be reported to the Liberty IRB for verification of continued exemption status. You may report these changes by submitting a change in protocol form or a new application to the IRB and referencing the above IRB Exemption number.

If you have any questions about this exemption, or need assistance in determining whether possible changes to your protocol would change your exemption status, please email us at irb@liberty.edu.

Sincerely,

Fernando Garzon, Psy.D.
Professor, IRB Chair
Counseling

(434) 592-4054

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Appendix B: IRB Technical College

CENTRAL GEORGIA
cgtc
TECHNICAL COLLEGE

Macon Campus
3300 Macon Tech Drive ■ Macon, Georgia 31206
p: 478.757.3400 ■ www.centralgatech.edu

DATE: May 9, 2014

TO: Mr. Jeff Hoffman

FROM: Deborah J. Burks, VP for Institutional Effectiveness

RE: IRB Request

Dear Mr. Hoffman:

Thank you for choosing Central Georgia Technical College (CGTC) as a site to conduct your research concerning student motivation in an effort to fulfill your requirements towards the Liberty University Doctoral program. On behalf of president Ivan H. Allen, Ed.D., the project is approved to move forward. CGTC is a public not-for-profit post-secondary higher education institution and has a diverse population of students. The results of your study could possibly inform the College's complete college agenda.

I have attached a copy of the approved CGTC IRB consent forms that you completed. Please keep the Office of Institutional Effectiveness apprised of your efforts to complete the project and your results.

Sincerely,

A Unit of the Technical College System of Georgia / An Equal Opportunity Institution

Appendix C: Email Invitation to Participate

SAMPLE Email – Invitation to Participate

Subject: Technical College Student Motivation Survey

Dear CGTC Degree Student,

My name is Jeff Hoffman and I am a doctoral student at Liberty University School of Education. Below is a link to a survey that is part of my research for my dissertation. It is a short 10-15 minute survey about what motivates technical college degree students toward a higher grade in their core academic classes like MATH 1111 College Algebra and ENGL 1101 English Composition I. Plan on having pizza at the end of class for all participants to show my gratitude for being a part in this research effort. It's totally voluntary and there is no negative effect toward you for not participating. Your participation is greatly appreciated! The online survey will be taken during class time using this email to link you to the survey or feel free to take it now. There is an Informed Consent Form at the beginning of the survey for your consent to participate.

https://www.surveymonkey.com/s/F7L7V35

Thanks for your time,

This link is unique to you. Please do not forward it.