The Influence of Grit on Career Decision Self-efficacy within the Context of an Undergraduate Career Success Course

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ABSTRACT

Recent interest in the development of non-cognitive skill development within the educational environment can play an important role in helping students succeed while in school and beyond. The purpose of this quantitative, quasi-experimental design study is to explore what influence a career focused Introduction to Business course embedded with grit lessons that is administered to full-time undergraduate college students has on measures of grit and career decision self-efficacy. Data gathering instruments included the 12 item Grit Scale (Duckworth et al., 2007) and the Career Decision Self-Efficacy Scale (Betz & Taylor, 2012). Dependent variables are grit and career decision self-efficacy (CDSE) scores. The independent variable will be the modified Introduction to Business Course with embedded grit lessons. The control group received the standard Introduction to Business curriculum. The treatment and control condition will be administered simultaneously over a seven-week period, meeting twice per week for 50 a minute class period. Grit and CDSE were measured using pretest-posttest design to promote the isolation of the dependent variables measured on posttest as an indication of the treatment. Grit and CDSE showed no statistically significant relationships between the two constructs. The treatment group did show small positive effect in posttest grit scores versus the control group. No statistical significance was identified for CDSE scores between the control and treatment groups. The results of this study may provide evidence, grounded in research, that can provide additional support in the development of grit in the classroom environment and further understanding of the relationship between CDSE and grit.

Keywords: Grit; career decision self-efficacy; non-cognitive skill development

INTRODUCTION

Since the initial authorization of the 1965 Elementary and Secondary Education Act (ESEA), several presidents have instituted educational reforms to increase student achievement in the classroom and after. Some of these reforms include, but are not limited to, the Space Race, Goals 2000, No Child Left Behind, and most recently, Race to the Top (Initiative, 2012). One common goal of each reform has been to put the United States on a trajectory to compete with other nations by illustrating that it has the best and top performing students (Wilkins, 2014). Many of these reform efforts centered on accountability and the educational approaches related to these initiatives focus on the intellectual aspects of success, such as content knowledge (Shechtman, DeBarger, Dornsife, Rosier, & Yarnall, 2013). Shechtman et al, (2013) and Farrington, Roderick, Allensworth, Nagaoka, Keyes, Johnson and Beechum, (2012) concluded that this is not sufficient. If students are to achieve their full potential, they must have opportunities to engage and develop a much richer set of skills and beliefs about themselves, which then become the vital forces in their success or failure in all endeavors (Pajares & Shuck, 2002).

There is a growing movement to explore the potential of the "non-cognitive" factors – attributes, dispositions, social skills, attitudes, and intrapersonal resources, independent of intellectual ability – that high performing individuals draw upon to accomplish success (Shectman, 2013). Evidence of this movement is emphasized in a 2011 research report sponsored by the College Board where Schmitt, Billington, Keeney, Reeder, Pleskac Sinha, and Zorzie (2011) discussed a review of the existing literature exploring student success and the importance of identifying valid and reliable measures within the SAT/ACT standardized assessments that address non-cognitive skills in addition to content knowledge.

Background of the Problem

The Pennsylvania Department of Education's Academic Standards for Career Education and Work (Pennsylvania Department of Education, Academic Standards for Career Education and Work. Retrieved from - http://www.pacareerstandards.com/documents/career-education-and-work-standards.pdf) has been introduced to support students' long-term achievement and success in the rapidly changing workplace and the demand for continuous learning and innovation within our workforce. The skills necessary to meet the changing economy, coupled with higher unemployment rates and rapidly changing technology, contribute to the societal perception that public education, colleges, and universities have the responsibility to educate their students about career decision making (Peng, 2001). The economic future depends on having a well-educated and skilled workforce. The belief is that no student should leave secondary education without a solid foundation in career education and work (Shechtman et al., 2013).

The rapidly changing workplace and demand for continuous learning and innovation on the part of the workforce necessitates the establishment of Academic Standards in Career Education and Work (ASCEW) (Shechtman et al., 2013). Many students who progress easily through middle and high schools are dropping out of colleges (Lyon, 2014; Tough, 2012). Tough (2012) emphasized that one possible reason might be "people who have an easy time of things, get feedback that everything they are doing is great and as a result, we are setting students up for long-term failure" (p. 2). Similarly, Duckworth (2009) contended that many American children have trouble making choices that require them to sacrifice short-term pleasure for long

term gain, and programs that build self-discipline, perseverance, and resiliency may be the royal road to building academic and career success. Focusing on an individual's consistency of interest and the persistence of effort, Duckworth (2007) has championed the term "grit" which is defined as "persistence and passion for long term goals" (p. 1087).

"Conventional wisdom and political correctness have for almost a century blamed the teachers, the schools, the classroom size, text books, funding, and parents for the failure of students – putting the blame on anything or anyone but the students themselves" (Seligman, 2011, p. 103). Many states and districts are developing measures of high school and college readiness that solely rely on coursework and standardized test scores as readiness benchmarks (Farrington et al., 2012). While academically challenging tasks offer the opportunity for learning, they also present the risk of failure, thereby threatening the students' sense of worth when failure is realized (Ames & Archer, 1988). In Wilson's (2015) interview with Dan Jones, Director of Counseling services at Appalachian State University, Jones stated that students have not developed the skills in how to sooth themselves, because their parents have solved all their problems and removed the obstacles for them. Individuals, including high performing students, need to encounter frustration and failure because learning how to respond to failure is essential for success (Hoerr, 2012). The lack of resiliency in the face of conflict or uncertainty also impacts the career decision making process at a time in young adult development when important educational choices need to be implemented (Farrington et al., 2012).

To help students navigate career decision making frustration and periodic failures, and to support long term academic and career success, colleges and universities have attempted to provide career decision making assistance on a large scale through career exploration courses. Halasz and Kempton (2000) stated that the availability of career development courses on college campuses has increased over the past 25 years because group interventions allow cost effective dissemination of information to large groups of students. Career exploration courses have thus become a primary career intervention offered by colleges and universities to assist students in resolving career decision-making difficulties (Folsom & Reardon, 2001).

Some researchers have suggested that career decision-making difficulties arise due to the complexity of the career decision-making process (Gati, Krause, & Osipow, 1996). To make a career decision, an individual needs to integrate large amounts of information involving oneself and the world of work (Gati et al., 1996). One aspect of self that has been examined in relation to career decision-making is self-efficacy, which is defined as an individual's belief in his or her ability to succeed at a given task (Bandura, 1977). Evidence increasingly suggests that college and career readiness is driven by more than just mastering content knowledge in an effort to reach a single goal and a student's ability to realize long-term success relies heavily on stringing together goals, overcoming challenges, and initiating productive non-cognitive factors (Farrington et al., 2012). In order to have substantial impact on school performance, student achievement, and long term career success, short-term interventions that target student's psycho-social beliefs, promote social belonging, or praise effort over result may be the key to long term success (Blackwell et al., 2007; Dweck, 2006; Duckworth & Seligman, 2005).

A recent trend in educational research is beginning to explore "non-cognitive" factors, "soft skills," or character traits (Lyon, 2014). In an article by Duckworth and her colleagues (2013) presenting an overview of her research, they believed that one characteristic emerged as a significant predictor of success and it was not social intelligence or IQ, it was grit. Derived from the research on grit, Duckworth and her colleagues developed a Grit Scale, a 12-item self-report

questionnaire, to measure what they saw as the two distinct dimensions of grit: consistency of interest and persistence of effort (Farrington et al., 2012).

Duckworth conducted multiple studies of high performing individuals such as West Point military cadets, students in the Scripps National Spelling Bee, college undergraduates and private preparatory school students. Based on these studies, Duckworth maintains that talent and perseverance together are the determinants to one's achievement (Lyon, 2014). In 2013, the Federal Department of Education's Office of Educational Technology released a study entitled: Promoting Grit, Tenacity and Perseverance: Critical Factors for Success in the 21st Century. The findings provided further support that grit, tenacity, and perseverance are malleable; they can be influenced through educational interventions and transferable across environments (Lyons, 2014). Lyons' (2014) study which focused on the development of grit with fifth grade students also indicated that future work needed to be done to examine how educators can adopt or adapt these approaches in their own settings.

The way in which the education system prepares student to overcome obstacles, persevere though challenges, and continue to pursue their stated goals may be just as important to success and achievement as standardized test scores (Farrington et al., 2012). Pajares and Schunk (2002) stated that "the beliefs that children create, develop, and hold to be true about themselves are vital forces in their success or failure in all endeavors and, of particular relevance to educators, to their success or failure in school" (p. 2). This concept of striving for an objective with persistent stamina, especially in the face of adversity, seems to be a more legitimate predictor of success than IQ or talent alone (Duckworth, 2009).

Grit may be one key to unlocking talent, enabling a person to become whatever he or she desires (Duckworth, 2007). Gritty qualities such as determination, resilience, persistence, self-control, optimism, and conscientiousness are all traits that can be taught, practiced, and reinforced (Packard, 2007). It stands to reason that intentionally teaching individuals attributes related to grit, and then allowing them to create strategies to practice the cultivation of these tools of the mind, will foster ways for individuals to become more successful than they would have been without the grit lessons. Based on the body of research available on the importance of non-cognitive factors to individual achievement, "educators and scientists need to conduct more research related to measuring the factors and how to create learning environments in which to promote and nurture these skills" (Shectman et al., 2013, p. 2).

As the body of literature supporting the importance of non-cognitive skills continues to expand, more specific questions arise in relation to how non-cognitive skills are developed in specific contexts. Within higher education, many new students report that their number-one goal for attending college is to prepare for an occupation (Astin, 1993; Ruffalo Noel Levitz, 2016). To understand student success in career decision making, college and career goal attainment, and non-cognitive skill development, this study intends to explore if specific educational interventions in the form of a college level career success course (CSC) focused on non-cognitive skill development, specifically "grit", will improve student measures on the Grit Scale and, in turn, also influence Career Development Self-Efficacy scores.

Purpose of the Study

The purpose of the study was to explore what influence an Introduction to Business course embedded with grit lessons administered to college students has on measures of grit and Career Decision Self-efficacy (CDSE). The course was a standalone introductory career course

for college students enrolled in an undergraduate business administration curriculum. This researcher was also interested in further understanding the relationship between grit scores and Career Decision Self-efficacy scores. This was a quantitative study utilizing a quasi-experimental, nonequivalent comparison-group design with a pretest-posttest control-group (Johnson & Christianson, 2014).

Research Questions

There were three research questions for this study:

Q1. What is the relationship between grit scores and CDSE scores for college students who participate in a one credit CSC embedded with grit lessons versus those who do not participate in grit lessons?

Q2. What is the difference in grit score for college students who participate in a one credit CSC embedded with grit lessons versus those who do not participate in grit lessons?

Q3. What is the difference in career decision self-efficacy scores for college students who participate in a one credit CSC embedded with grit lessons course versus those who do not participate in grit lessons?

Theoretical Framework

As educational researchers are beginning to reframe their thinking on what key elements make students successful in school and beyond, Albert Bandura's (1977) Social Learning Theory emphasizes the importance of observing and modeling behaviors, attitudes, and the emotional reactions of others. In consideration of the many challenges associated with career decision making throughout the college process, Bandura's Social Learning Theory and concept of self-efficacy provide a theoretical basis to further investigate the development of traits related to grit within the context of a classroom career development intervention. Bandura's focus on attention and motivation within Social Learning Theory are further explored in the concept of self-efficacy. According to Bandura (1977), self-efficacy describes a person's belief about his or her ability to perform tasks or behaviors successfully. Individuals develop self-efficacy via four primary sources: performance accomplishments, physiological or emotional arousal, vicarious learning and modeling, and verbal persuasion (Bandura, 1977). Based on these factors, individuals subjectively identify and evaluate these sources of self-efficacy information (Betz, 2000; Bollman, 2009). Performance accomplishments are thought to be primary contributors to the development of self-efficacy beliefs because they are derived from personal mastery of tasks. Repeated successes raise expectations and allow the individual to cope with the impact of intermittent failure (Bandura, 1977). Repeated failures, on the other hand, lower mastery expectations and hamper an individual's level of self-efficacy related to a specific task.

In addition to performance accomplishments, another source which influences self-efficacy information for an individual is psychological or emotional arousal (Bandura, 1977). While emotional arousal provides an individual cues that lead to a specific outcome, self-efficacy expectations may influence how the individual attempts to complete the task, the amount of effort put into the task completion, and the degree of persistence employed toward task completion when faced with obstacles (Bollman, 2009). Betz (2000) emphasized that an individual's self-efficacy beliefs must be associated with behavior in order to have meaning for

the individual. For example, if an individual successfully passes a psychology course, they will perceive that they have the confidence to successfully pass another psychology course.

Bandura (1986) defined perceived capabilities as "types of outcomes people anticipate that depend largely on their judgment of how well they will be able to perform in a given situation" (p. 392). According to Bandura (1997), efficacy beliefs have an impact on effort, persistence, and even the choice of activity to pursue (Wilkins, 2014). Similarly, grit also emphasizes persistence of effort and consistency of interest. Further research regarding self-efficacy illustrates that when an individual's self-efficacy beliefs are applied to academic activities, self-efficacy is a stronger predictor of academic success than standard measures of ability, such as intelligence (Usher & Pajares, 2008). According to Bandura (1997), students who have a higher sense of self-efficacy set higher goals for academic achievement. Individuals who set goals create adaptive responses in how they emotionally react when obstacles are encountered (Pintrich, 1990). An adaptive response is characterized by seeking a challenge and persisting in the face of obstacles (Pintrich, 1990). By contrast, individuals with lower self-efficacy tend to use maladaptive responses when they encounter challenges. Carol Dweck (1986) characterized maladaptive responses as avoidance of challenge and low persistence on task completion in the face of adversity and identified this as fixed mindset.

Significance of the Study

This research study addresses a gap in the literature by exploring the development of traits related to grit and its relationship to career decision self-efficacy (CDSE) within the context of an undergraduate career success course (CSC) through a standalone introductory career course for college students enrolled in a business curriculum. Farrington et al. (2012) noted the importance of further research conducted on teaching techniques and strategies related to non-cognitive skill development to better understand and identify effective strategies at the college level. Based on the challenges college students face in selecting a course of study and career path, they need the skills necessary to navigate a rapidly changing economy, high unemployment rates, and quickly changing technology in the economy (Peng, 2001). This study sought to explore if a non-cognitive skill development intervention within a career success course will help to contribute to the societal perception that public education, colleges, and universities have the responsibility to educate their students about the career decision-making process which supports their long-term education and career goals (Peng, 2001).

This investigation fills a void in existing research about strategies for developing non-cognitive skills within the context of an undergraduate career success course. The result of the investigation contributes evidence from a rigorous methodological design to the scholarly literature and explores the relationship between grit scores and CDSE scores. This quantitative study utilizes a quasi-experimental, nonequivalent comparison-group design with pretest-posttest control-groups (Johnson & Christianson, 2014). An absence testing technique was deployed in which the treatment group received specific grit lessons while the control group did not. The subject group was identified through convenience sampling technique for undergraduate business administration students with pretest data collection utilizing the 12-Item Grit Scale (Duckworth et al., 2007) and the Career Decision Self-Efficacy Scale (Betz & Taylor, 2012). The dependent variable (DV) was grit and career decision self-efficacy scores. The independent variable (IV) was the one credit, 7-week Introduction to Business course with embedded grit lessons. The control groups were participants in the existing Introduction to Business undergraduate course at

a four-year, private institution in the mid-Atlantic region of the United States. While both control and treatment conditions were expected to positively impact the CDSE scores, the nature and extent of the impact of the treatment condition on grit scores and their relationship to CDSE within the treatment condition was unknown. The methodology, treatment conditions, and procedures are detailed in Methodology.

Assumptions, Limitations, & Delimitations

An inherent limitation of both instruments used in this study was the self-reporting method for gathering data. A limitation specific to the treatment group is that students may not attend all classes, and thereby may not receive the full treatment condition as designed. The timing of this study may have pose limitations since it will be taking place during the second half of the fall academic semester. The second half of the fall semester is typically a challenging timeframe as students work to complete all academic requirements and prepare for final examinations. Since the majority of the population for this study was expected to be freshman, this experience in their first semester as college students may have been challenging for them.

An assumption for this research was that the treatment curriculum would be delivered by the course instructors as designated by the researcher. Prior to executing the study, the researcher minimized the potential impact of multiple facilitators executing the treatment condition by teaching the course instructors the curriculum as if they were the students to promote the best possible transfer of the intended treatment design. The primary investigator met with the instructors weekly to discuss the delivery of the treatment condition and promote fidelity within the treatment design.

A delimitation for this study relates to the sample population, as they must be identified as pursuing a Bachelor of Science degree in Business Administration.

Definition of Terms

Career Decision Self-efficacy (CDSE)- An individual's belief that he or she can effectively accomplish the tasks necessary to making career decisions (Taylor & Betz, 1983)

Career Success Course (CSC)- For the purposes on this study, the Career Success Course refers to a 7 week, 1 credit hour, academic course that facilitates student's exploration of an individual's character strengths, career interest areas, academic mindset, with lessons designed to increase non-cognitive characteristics such as grit.

Grit - Perseverance and passion for long term goals (Duckworth, 2007)

Growth Mindset - A belief that an individual's most basic abilities can be developed through hard work and determination. Failures are related to external actions, not internal reflections of character (Dweck, 2006).

Non-cognitive Skills – Those academically and occupationally relevant skills and traits such as motivation, persistence, resiliency, and self-regulation, that are not specifically intellectual or analytical in nature (Rosen, el at., 2010).

Self-efficacy - An individual's belief in his or her ability to succeed at a given task (Bandura, 1977).

Success - a personal measure of accomplishment by which someone has worked strenuously towards an objective and achieved that goal over time (Dickens, 2011; Duckworth et al., 2007; Lyons, 2014).

METHODOLOGY

The purpose of the study was to explore what influence an Introduction to Business course embedded with grit lessons administered to college students has on measures of grit and career decision self-efficacy. The course was a standalone introductory career course for college students enrolled in a business curriculum. This researcher is also interested in further understanding the relationship between grit scores and career decision self-efficacy scores. The treatment curriculum addressed traditional career awareness topics such as self-appraisal, goal selection, and problem-solving activities coupled with specific lessons focused on the development of characteristics related to grit. A participant demographic sheet was administered to collect participant demographic data. Grit was measured using the 12-Item Grit Scale for Adults developed by Duckworth, Peterson, Matthews, and Kelly (2007). Career decision self-efficacy was measured by the Career Decision Self-Efficacy Scale (CDSES) developed by Betz and Taylor (2012) and published by MindGarden, Inc. This study examined pretest scores for both instruments at the start of the CSC course and posttest scores at the conclusion of the CSC course. A control group was also administered pretest and posttest scores within the same timeframe as the treatment group.

Methodology and Design

This was a quantitative study utilizing a quasi-experimental, "nonequivalent comparison-group design with pretest-posttest control-group" (Johnson & Christianson, 2014 p.339). An absence testing technique was deployed in which the treatment group participated in the grit lessons and the control group did not participate in the grit lessons. The subject group was college students enrolled in the "Introduction to Business" one credit course with pretest and posttest data collection utilizing the Grit Scale (Duckworth et al., 2007) and the Career Decision Self-efficacy Scale (Betz & Taylor, 2012). Dependent variables (DV) were grit and career decision self-efficacy scores. The independent variable (IV) was the Introduction to Business course embedded with grit lessons and administered to the experimental group over a 7-week period meeting twice per week for 50 minutes during the fall semester. It was anticipated there would be a total of eight sections of the "Introduction to Business" course with approximately 15 to 20 students in each section. Four sections (CSC) would receive the treatment and the remaining four sections of the standard Introduction to Business course would represent the control group. The design of the study is diagrammed in Figure 1 (Appendix).

Creswell (2014) suggested the use of a nonequivalent (pretest and posttest) control-group design when the intent of a study is to determine the effect of a treatment on a measured outcome. This design was chosen because random assignment of individuals to treatment groups was not practical because participation in the study was voluntary and students were assigned to course sections based on the availability within their academic schedule. Because pre-established classes could not be randomly assigned, convenience sampling was used to establish treatment and control groups. The use of pretest controls for any differences between the treatment group and the control group was examined. In Figure 1, Group A represents the treatment group and Group B represents the control group. An O represents the pretest and the posttest, and the X represents the treatment, which is the Introduction to Business course embedded with grit lessons. The difference in student's pretest and posttest scores will be

calculated. A multiple analysis of variance (MANOVA) was performed to determine whether the treatment (participation in the CSC course with embedded grit lessons) had any effect on dependent variables compared to the control group. A Pearson Correlation Coefficient was also used to explore the relationship between the grit and CDSE scores from the pretest and posttest data sets. Analysis of covariance (ANCOVA) was also utilized to analyze research questions two and three.

Control Conditions

This quasi-experimental design utilized a control group, one-credit graded Introduction to Business course, which is typically taken in the fall semester for students enrolled in the Bachelor of Science in Business Administration program. Four sections were identified of the standard 7-week course which meets twice per week for 50 minutes. Students majoring in business administration are required to take the Introduction to Business course in order to graduate with a Bachelor of Science degree in Business Administration. The typical course is focused on specific business school concepts, self and career-exploration, and oral communication skill development. Course objectives helped students to explain and utilize the career planning and mentoring process, identify interest, skills, and values, identify the role of liberal arts, gather occupational information, explore business related career fields, describe an effective decision making process, and discuss action planning. Course delivery was primarily conducted through lecture and in class exercises. During the first-class period, students in all sections were invited to voluntarily participate in the proposed research study through a Voluntary Consent Form. Participants were not aware if they were in the control or treatment group. Students who chose not to participate in the study had their data destroyed. All participants were given a demographic data sheet as well as the pretest battery of assessments including the 12 Item Grit Scale and the Career Decision Self-efficacy Scale.

Treatment Conditions

The treatment intervention consisted of 4 class sections of a modified Introduction to Business course which will be didactic and experimental in nature. The treatment intervention implemented classroom experiences, course work, and lessons designed to develop and nurture traits related to grit. The treatment curriculum was developed by the primary investigator (PI) based on Seligman's (2011) book, "*Flourish: A visionary view of happiness and wellbeing*", U.S. Army Master Resiliency Training (Reivich, Seligman, & McBride, 2011), and Carol Dweck's (2006) book "*Mindset: The psychology of success*". Components of the Master Resilience Training in the U.S. Army were adjusted to the college student population (Reivich, Seligman, & McBride, 2011). The treatment curriculum focused on developing skills to encourage consistency of interest and persistent effort. Classroom lecture and exercises related to Martin Seligman's (2011) concept of Well-Being and the five elements; Positive emotion, Engagement, Relationships, Meaning, and Achievement (PERMA) were explored within a lecture format, in-class exercise, and homework assignments. Additionally, students took the VIA Character Strengths Assessment (Retrieved from http://www.viacharacter.org) and applied their identified strengths in character to past personal struggles. Growth mindset and positive psychology principles were also discussed through lecture, experiential exercises, and a student reflection paper. Components of the class supported the development of an oral self-advocacy presentation

which integrated the concepts into the career planning/decision making process. The CSC addressed the strengthening of relationships among the students by subdividing the class into 4-5 student working groups to foster a sense of community and strengthen personal relationships between students. Experiential in-class exercises encouraged students to interact as a team throughout the process of accomplishing a difficult common goal. The intervention was implemented in a reliable manner across all treatment classes in accordance with an instructor's manual which details the course curriculum in terms of lecture, readings, in-class exercises, and assignments.

CSC instructors attended weekly consultation meetings with the PI to discuss curriculum implementation and the lesson plans regarding upcoming classes. These weekly meetings helped to standardize the treatment across the four sections to provide treatment subjects with similar learning opportunities and experiences. Two instructors each had taught two sections of the treatment course intervention. The control group enrolled in the existing Introduction to Business course was taught by two traditional facilitators utilizing the standard curriculum without the treatment condition present. Table 1 (Appendix) summarizes the differences between the control and treatment conditions.

Setting and Sample

The study participants were full-time college students enrolled in a four-year undergraduate Bachelor of Science in Business Administration (BSBA) program. The target population was students who were scheduled for the Introduction to Business, one credit course, in the Fall 2016 semester. Estimated size of the population was130-160 students attending a small, private, not-for-profit liberal arts college located in Northeastern Pennsylvania. The study setting was classified under the Carnegie classification as Master's Colleges and Universities. The setting was a small college with an undergraduate population of 2,308 students. Study participants were college students, between the ages of 18 and 34 years old at the time of study.

A prerequisite for inclusion in the study involved the completion of an assessment battery at both the start and completion of the course. Instructors assigned to teach the course applied both the experimental treatment and the standard control conditions in the "Introduction to Business" (control) and the CSC (treatment) course. Participants were given a demographic survey to be completed in the beginning of the course requesting information regarding potential variables of interest including; gender, age, year in school, cumulative GPA, ethnic background, major choice status, first generation college status, and career choice status. For the GPA, first semester freshmen were asked to list their high school GPA instead. The major choice variable consisted of three levels indicating whether subjects are decided, tentatively decided, or undecided regarding major field of study. Similarly, the career choice status variable will consist of three levels indicating whether subjects were decided, tentatively decided, or undecided about their career choice. Data was collected during the pretest and posttest phase. To ensure confidentiality, participants were assigned participant numbers as identified on the Participant Demographic Sheet to accurately correlate their pretest and posttest data.

Instrumentation and Materials

Grit was measured using the 12-Item Grit Scale for Adults developed by Duckworth, Peterson, Matthews, and Kelly (2007). Career decision self-efficacy was measured by the Career

Decision Self-Efficacy Scale (CDSES) developed by Betz and Taylor (2012) and published by MindGarden, Inc.

To measure individual grit, participants completed the paper test 12 item Grit Scale (See Appendix D) and the results were scored by hand. Individual scores were recorded for both pretest and posttest measures and were represented the variable grit. The 12 item Grit Scale developed by Duckworth et al. (2007) was shown to have valid and reliable psychometric properties (Duckworth & Quinn, 2009). Responses to each of the 12 items are based on a 5-point Likert scale which ranges from *very much like me* to *not like me at all*. Scores range between 1 and 5 with the maximum score on this scale being 5, extremely gritty, and the lowest score on this scale being 1, not at all gritty. Two primary subscales are identified within the grit assessment: 1) focused effort and 2) interest over time (persistence).

The Career Decision Self-efficacy Scale (CDSES) development by Taylor and Betz, (1983) was used to assess career decision making self-efficacy expectations for both pre and posttest measures and represented the variable for career decision self-efficacy (See Appendix E). Through this assessment, individuals were instructed to indicate their confidence in their ability to successfully complete each career decision-making task through the online version of the assessment. Scores were automatically calculated by the software system through Mindgarden, Inc. Responses to each of the 50 items are based on a 5-point Likert scale with 1 indicating *no confidence* and 5 indicating *total confidence*. Five subscales were identified with the CDSE assessment: 1) accurate self-appraisal; 2) gathering occupational information; 3) goal selection; 4) making plans for the future; and 5) problem solving. Ten items were written to reflect each competency area in the assessment. An updated online version of the assessment copyrighted in 2012 was utilized in this study.

Data Analysis

All analyses were conducted using the Statistical Package for Social Sciences (SPSS). To examine the research questions, a repeated multivariate analysis of variance (MANOVA) was conducted to assess if mean differences exist between control and treatment groups. The MANOVA is an appropriate statistical analysis when the purpose of research is to assess if mean differences exist on more than one continuous dependent variable by one or more discrete independent variables. For this research proposal, the continuous dependent variables are grit scores and CDSE scores; the independent variable has the treatment group receiving the CSC curriculum while the control group receives the traditional Introduction to Business curriculum. MANOVA assesses whether mean differences among groups on a combination of dependent variables are likely to have occurred by chance. The MANOVA creates a linear combination of the dependent variables to create a grand mean and assesses whether there are group differences on the set of dependent variables. The MANOVA uses the *F*-test; the ratio of two independent variance estimates of the same population variance. The *F*-test allows researchers to make the overall comparison on whether group means differ. If the obtained *F* is larger than the critical *F*, the null hypothesis is rejected (Statistical Solutions, 2013).

Following a repeated measures MANOVA, necessary post hoc ANCOVA was used to explore research questions two and three. An ANCOVA is a general linear analysis which blends ANOVA and regression. ANCOVA evaluates whether population means of a dependent variable (DV) are equal across levels of a categorical independent variable (IV) often called a treatment, while statistically controlling for the effects of other continuous variables that are not

of primary interest, known as covariates (CV) or nuisance variables. All test assumptions were verified prior to conducting the MANOVA and ANCOVA analysis. As required for MANOVA, a Pearson correlation coefficient will also be calculated on the two dependent variables to measure of the strength of a linear association between the two variables which is typically denoted by *r*. A Pearson correlation attempts to draw a line of best fit through the data of two variables, and the Pearson Correlation Coefficient, *r*, indicates how far away all these data points are to this line of best fit and if they fall within the range and value of +1 to -1.

Threats to Validity

Internal validity refers to how well the experiment is done related to controls for confounding influences other than the dependent variable. One way to increase internal validity is to minimize the effects of unintended changes in the dependent variables (Neuman, 2006). Neuman (2006) and Vogt (2007) warned of several common threats to internal validity, including selection bias, maturation and history effects, and communication among subjects. Some of these threats may be present in this study; however, steps were taken to minimize the effects. An additional threat to internal validity is that multiple individuals will be delivering the treatment condition. To address concerns related to the fidelity of the treatment condition, both facilitators participated in training on the curriculum and met weekly with the PI to review the up-coming week's curriculum. In addition, facilitators and participants will utilize the same course materials including a course binder which consolidated all course materials.

Selection bias, like self-selection (Vogt, 2007), occurs most often in nonexperimental research when subjects are not randomly assigned (Neuman, 2006). While this proposed study does not allow the researcher to randomly assign subjects within the treatment and control groups sections, the subjects are designated to course sections based on their academic schedule in the fall semester which is commonly referred to as convenience sampling within the quasi-experimental design.

Maturation and history effects are threats to internal validity that may occur when a study takes places for an extended amount of time because events taking place during that time can jeopardize the design and intentions of the study (Vogt, 2007). The proposed research was not vulnerable to maturation or history effects because this study was implemented within a 7-week period. This design attempts to minimize any risk of attrition of subjects, shifts in attitudes, or other biological, psychological, or emotional changes that may occur over time (Neuman, 2006; Vogt, 2007). The PI did expect typical course attrition, as a small number of students do typically attrite from the course during the timeframe the course is executed.

A final consideration of internal validity for this study entailed the concern of communication among subjects (Vogt, 2007). Neuman (2006) referred to this as diffusion of treatment, during which time subjects in the control group and treatment group may communicate about the content within their respective courses. This threat is more common during experimental research when participants from the treatment and nontreatment groups may discuss research technique and influence results. As applied to this study, a diffusion of treatment is a possible threat because subjects within the control group and treatment group may compare notes regarding the curriculum within their classes. The PI has specified within the protocol directions for the research study that students within a control group may not make up a class by attending a treatment course section and vice versa. However, this may still have

allowed subjects the opportunity to communicate with one another and may have imposed a slight threat to internal validity.

External Validity

According to Vogt (2007), external validity refers to the ability to generalize the results of the study to a larger population. Threats to external validity may limit a researcher's ability to make proper inferences from the sample to other future situations (Creswell, 2014; Newman, 2006).

Mundane realism is a type of threat to external validity when the experiment does not relate to real world activities (Neuman, 2006). This research was not at risk for this type of external validity because all participants were undergraduate college students participating in an Introduction to Business course required within the business school curriculum. Participants also completed a demographic data sheet to identify any anomalies within the group demographics. Reactivity, as explained by Neuman (2006), may have posed a threat to the external validity of this research project because students may have perceived an expected or desirable response to certain items and may not have responded in a manner most representative of their current beliefs and practice.

Ethical Considerations and Informed Consent

The PI took all steps necessary to ensure the quality and integrity of this proposed research study. The PI sought informed consent from all participants by using the Voluntary Informed Consent Form (see Appendix B). All participant data was kept confidential by assigning participants subject numbers to eliminate their names or other identifying information to the data. All documents were locked and secured in the PI office, which also maintains confidential client information daily. The PI has not identified any specific concerns related to unintended harm to subjects. The PI removed himself from the implementation of the treatment and control conditions throughout the research study to minimize any bias and maintain independence and impartiality throughout the research study.

FINDINGS

The purpose of the study was to explore the influence an Introduction to Business course embedded with grit lessons administered to college students had on measures of grit and career decision self-efficacy. The course was a standalone introductory career course for college students enrolled in a business administration curriculum. This researcher was also interested in further understanding the relationship between grit scores and career decision self-efficacy scores. This was a quantitative study utilizing a quasi-experimental, nonequivalent comparison-group design with pretest-posttest control-group (Johnson & Christianson, 2014). The control group participated in the standard curriculum content while the treatment group was administered a modified curriculum focused on traits related to grit. The independent variable for this study was the Introduction to Business course with the embedded treatment curriculum. The dependent variables were grit and career decision self-efficacy scores.

Description of the Sample

Study participants were solicited from a small, private, not-for-profit liberal arts college located in Northeastern Pennsylvania with a Carnegie classification of Master's Colleges and Universities with an undergraduate population of 2,308 students in 2014. Study participants were fulltime undergraduate college students, between the ages of 18-34 years old at the time of the study. The original sample group was comprised of 160 students enrolled in a one credit Introduction to Business course during the Fall 2016 semester. The data cleaning process entailed assurance of completed voluntary consent forms, completed pretest, and completed posttest data sets. After this process, the total number of participants in the study was 95 students. Of the 95 total participants, the control group consisted of 42 participants and the treatment group consisted of 53 participants.

Control Group Description

The control group in this study ($n = 42$) was comprised of 25 males and 17 females. Ages ranged from 18 to 34 with 31 (73.8%) of participants in the 18-20 age range. Within the control group, 27 students identified as Caucasian Americans. Further details on demographic information can be found in Table 2 below. Twenty-four (57.1%) of the control group identified their academic year as freshmen, 12 as sophomores, and 5 as juniors. The most popular area of study within the control group was Accounting with 14 followed by 9 Management, and 6 Marketing. Three control group participants identified having a major outside of the business school and 2 provided no data. When control group participants were asked to rank their confidence in choice of academic program, 2 identified as undecided, 4 as tentatively decided, and 35 firmly decided. Career choice status was more evenly distributed for the control group with 10 participants identifying as undecided, 17 as tentatively decided, and 15 as firmly decided on career choice. See Table 2 (Appendix).

Treatment Group Description

The treatment group in this study ($n = 53$) was comprised of 39 males and 14 females. Ages ranges from 18 to 24 with 46 (86.8%) of participants in the 18-20 age range. Most treatment group participants (84.9%) were students who identified as Caucasian Americans. Further details on demographic information can be found Table 2 above. The majority of participants (81.1%) of the treatment group identified their academic year as freshmen. The most popular area of study within the treatment group was Accounting with 17, followed by 11 Management, and 9 Marketing majors. When treatment group participants were asked to rank their confidence in choice of academic program, 35 were firmly decided. Career choice status included 17 participants identifying as undecided, 29 (54.7%) as tentatively decided, and 7 identified as firmly decided on their career choice. See Table 3 (Appendix).

Study Summary

To determine the effectiveness of the intervention, a nonequivalent control group design was used (Johnson & Christensen, 2014). Students registered in the Introduction to Business course were randomly divided by section into the control and treatment groups. All participants

were administered the pretest for grit and CDSE to establish a baseline score prior to the application of the treatment and control conditions. All results of the pretest assessment as well as the demographic information were then de-identified and coded into SPSS for analysis.

During the 7 week treatment period, the Introduction to Business course met twice a week for 50 minutes with the treatment group receiving the modified curriculum including the imbedded grit lessons which focused on concepts of mindset, interest, effort, and positive psychology. Treatment participants were engaged in group experiential activities which were to be challenging while not impossible to accomplish. Group reflection activities were also utilized to allow the working groups to process the activities as a team. Individual reflection assignments also encouraged individuals to personalize what they learned about themselves through classroom exercises and apply it to past personal experiences.

The control group was exposed to the traditional Introduction to Business curriculum which focused on goal setting, identification of career ingredients, action planning, resume development, and self-advocacy. Both control and treatment groups received the CareerLeader assessment, S.T.A.R. methodology, importance of mentoring, and self-advocacy presentation methodology. Near the conclusion the course, a posttest for grit and CDSE was administered to the control and treatment group.

Descriptive Statistics

Data gathered for this study was first examined at the descriptive level. The researcher then applied further inferential data analysis. In addition to the ANCOVA analysis on the dependent variables, a MANOVA analysis allowed the researcher to detect differences between two or more groups using a multivariate process that accounts for the two dependent variables. This complex extension of the ANOVA is appropriate when you have more than one dependent variable. The examination of descriptive statistics and verifying the underlying assumptions for each test are necessary before performing the analysis (Pallant, 2013). Assumptions for MANOVA and ANCOVA were verified prior to running the analysis and included a check for both univariate and multivariate outliers. This was accomplished through an examination of the distribution using boxplots and verifying the Mahalanobis distance. Additionally, the researcher checked the normality of the dependent variables (see Table 3), multicollinearity, and the homogeneity of variance-covariance matrices using the Box's M test. All assumptions revealed sufficient results. See Table 4 (Appendix).

The descriptive statistics for the dependent variables in this study are presented in Table 4 and contain a total of 95 participants (control n = 42; treatment n =53). As indicated, the pretest scores for grit in the control group (M = 3.44, SD = .51) and treatment group (M = 3.44, SD = .49) were nearly identical. The pretest scores for CDSE in the control group (M = 3.75, SD = .55) were higher than that of the treatment group (M = 3.53, SD = .71). A larger range existed in the treatment group from 1.70 to 5.00, with a range of only 2.7 to 5.0 for the control group. See Table 5 (Appendix).

When examining posttest scores, the control group grit scores (M = 3.43, SD = .50) and the treatment group (M = 3.59, SD = .41) increased. The posttest CDSE scores for the control group (M = 3.94, SD = .62) and the treatment group (M = 3.84, SD = .65) also showed an increase. A visual depiction of the similarities in distribution of pretest and posttest grit scores between the treatment group and control group is shown in Figure 3 and further supports the normality between groups. See Figure 3 (Appendix).

Figure 4 (Appendix), visually presents the similarities in distribution of pretest and posttest CDSE scores between the treatment group and control group, also supporting the normality of distributions and similarities between groups.

Data Analysis

A variety of data analysis techniques supported this study's analysis. First, the researcher used a MANOVA to examine multivariate differences between the two groups. The second analysis examined pretest-posttest mean differences within the control group and treatment group on the Grit Scale and the CDSE scores. Mean grit and CDSE scores were also analyzed utilizing an ANCOVA to determine if there were statistically significant differences in posttest scores when considering the pretest as the covariate. Effect size was also examined.

Research Question 1.

The first research question investigated in this study was: What is the relationship between grit scores and CDSE scores for college students who participate in a one credit CSC embedded with grit lessons versus those who do not participate in grit lessons?

A one-way MANOVA was performed to investigate if there was a statistically significant relationship between the two dependent variables, grit and CDSE. Results of the MANOVA indicated that there was not a statistically significant relationship between grit scores and CDSE scores for participants (F (1, 93) = .077, p = .783; Wilk's Λ = .999).

To explore the relationship of the pretest and posttest variables further, a Pearson correlation coefficient (r) matrix was created to examine the strength of the relationship between the variables in the treatment and control groups. The control group results showed positive, strong relationship between pretest and posttest grit scores (r = .753, n = 42, p < .001) and between CDSE pretest and posttest scores (r = .644, n =42, p < .001). A positive moderate relationship was identified between posttest grit and pretest CDSE (r = .443, n =42, p = .003) and between posttest grit and posttest CDSE (r = .462, n = 42, p = .002) as outlined in Table 6 (Appendix).

A Pearson correlation matrix also was created to examine the relationship between variables within the treatment group. The treatment group results showed positive, strong relationship between pretest and posttest grit scores (r = .627, n=53, p < .001). Positive, moderate relationships were identified between posttest CDSE and pretest CDSE (r =.505, n = 53, p < .001), pretest grit and pretest CDSE (r =.479, n = 53, p < .001), pretest CDSE and posttest grit (r =.445, n = 53, p =.001), and posttest CDSE and posttest grit (r =.462, n = 53, p <.001) as presented in Table 7 (Appendix).

Research Question 2.

The second question researched in the study was: What is the difference in grit score for college students who participate in a one credit CSC embedded with grit lessons versus those who do not participate in grit lessons?

An ANCOVA was conducted to determine a statistical significance between the pretest and posttest scores for the treatment and control groups on grit scores controlling for variance in pre-test scores. There is a significant difference between the control and treatment group posttest

scores after controlling for pretest score variance, $F(1,93) = 5.62$, $p = .02$. A Partial Eta Squared was calculated at .058 indicating a small effect size as noted in Table 8 below. The primary researcher is 98% confident that posttest grit scores for individuals within the treatment group are between .026 to .295 points higher than those in the control group. See Table 8 (Appendix).

Partial Eta Squared can be defined as the ratio of variance accounted for by an effect and that effect plus its associated error variance within this ANCOVA study (Cardinal & Aitken, 2006). The Partial Eta Squared value of .058 indicates that 5.8% of the between group variance is accounted for by the treatment condition. Effect size can be calculated, when differences in mean exist, to quantify the effectiveness of an intervention (Sprinthall, 2012). An effect size, when reported as Cohen's d, is considered small at .20, medium at .50, and strong at .80 (Sprinthall, 2012). The effect size (Cohen's $d = .24$) testing for the grit lesson treatment condition did have a small effect on mean gain scores of participants within the treatment group.

Research Question #3

The third question that was explored by this research was: What is the difference in career decision self-efficacy scores for college students who participate in a one credit CSC embedded with grit lessons course versus those who do not participate in grit lessons?

To explore the third research question an ANCOVA was conducted to determine a statistical significance between the posttest scores for the treatment and control groups on CDSE scores controlling for variance in pretest scores. There is no significant difference between the treatment and control groups posttest scores after controlling for pretest score variance, $F(1,93) = .032$, $p = .859$. Table 9 (Appendix) highlights these results.

Results

This research study explores three guiding research questions:

1. The first research questions investigated in this study was: What is the relationship between grit scores and CDSE scores for college students who participate in a one credit CSC embedded with grit lessons versus those who do not participate in grit lessons? Table 10 (Appendix) provides an overview of the descriptive statistics for the control and treatment groups on the pretest and posttest scores for grit and CDSE.

Because the preliminary assumptions testing revealed no serious violations, a one-way between groups MANOVA was performed to investigate if there was a statistically significant relationship between the two dependent variables, grit and CDSE. Results of the MANOVA indicated that there was not a statistically significant relationship between grit scores and CDSE scores for participants ($F(1, 93) = .077$, $p = .783$; Wilk's $\Lambda = .999$).

2. What is the difference in grit score for college students who participate in a one credit CSC embedded with grit lessons versus those who do not participate in grit lessons?

Pretest and Posttest scores for the control and treatment group were analyzed utilizing an ANCOVA. There was statistically significant difference in grit scores between the treatment and control group using the pretest as a covariate. The treatment group showed a more significant increase in grit scores when compared to the control group. The experimental treatment (grit lessons) also showed a small effect size on grit scores.

3. What is the difference in career decision self-efficacy scores for college students who participate in a one credit CSC embedded with grit lessons course versus those who do not participate in grit lessons?

Both the control group and the treatment group showed overall mean gain scores in posttest scores for CDSE, however, an ANCOVA revealed no statistical significance for this change after controlling for pretest score variance.

CONCLUSIONS AND RECOMMENDATIONS

The purpose of the study was to explore what influence an Introduction to Business course embedded with grit lessons administered to college students had on measures of grit and Career Decision Self-efficacy (CDSE). The control and treatment groups were administered a pretest and posttest for grit and CDSE. The treatment group received 7 weeks of a modified CSC curriculum and the control group received the traditional 7-week curriculum taught in the Introduction to Business course. The primary investigator provided course facilitators the implementation protocols for both the control and treatment group. The independent variable for this study was the modified Introduction to Business course curriculum. The dependent variables were grit and CDSE as measured by 12 item Grit Scale (Duckworth et al., 2007) and the Career Decision Self-Efficacy Scale (CDSES) developed by Taylor and Betz, (1983). For this reason, data analysis was multivariate in nature to accommodate for the two dependent variables of grit and CDSE (Johnson & Christensen, 2014; Muijs, 2011).

The research method was quantitative using a quasi-experimental, nonequivalent comparison group design (Shadish, Cook, & Campbell, 2002). Quasi-experimental research is a commonly used and suitable design for determining the effect of educational interventions (Muijs, 2011). The study investigated 3 research questions:

Q1. What is the relationship between grit scores and CDSE scores for college students who participate in a one credit CSC embedded with grit lessons versus those who do not participate in grit lessons?

Q2. What is the difference in grit score for college students who participate in a one credit CSC embedded with grit lessons versus those who do not participate in grit lessons?

Q3. What is the difference in career decision self-efficacy scores for college students who participate in a one credit CSC embedded with grit lessons course versus those who do not participate in grit lessons?

The data analysis included a thorough examination of the raw data and an explanation of the variety of descriptive statistics. A MANOVA test was performed for the multivariate analysis using pretest and posttest grit and CDSE measures for the first research question. The second and third research questions utilized an ANCOVA which was conducted to determine a statistical significance between the pretest and posttest scores for the treatment and control groups on CDSE scores controlling for variance in pre-test scores. This comprehensive analysis allowed the researcher to provide evidence and answers to each of the three research questions.

Through the literature review, few research examples were identified which specifically explored the development of grit through a classroom career course intervention. While a few examples were sited, there were not examples which focused on the post-secondary college student participants. Lyon's (2014) study titled "Teaching and Fostering Qualities Related to Grit" focused on a fifth-grade classroom, year-long intervention. Farrington's et al., (2012) "Teaching Adolescents to Become Learners; The Role of Non-cognitive Factors in Shaping

School Performance: A Critical Literature Review" specifically identified that high schools and colleges need to do more to ensure student success through the development of non-cognitive factors. These non-cognitive factors play a critical role in student's postsecondary success to graduation and beyond. A student's ability to accept critical feedback, openness to failure, ability to cope with frustrating and ambiguous learning challenges, and academic growth mindsets are non-cognitive areas which can be developed, yet research evidence on these methods and techniques are surprisingly weak (Farrington et al., 2012). This research study hopes to contribute to the gap in evidence-based research on classroom-level context that fosters students' intellectual and non-cognitive skill development.

Research Findings

Question 1. What is the relationship between grit scores and CDSE scores for college students who participate in a one credit CSC embedded with grit lessons versus those who do not participate in grit lessons?

Multivariate results indicate that there was not a statistically significant difference on the pretest and posttest for grit and CDSE when examining all participants in the study including control and treatment group ($F(1, 93) = .077$, $p = .783$; Wilk's $\Lambda = .999$). Since no statistical significance was identified between the control and treatment group, a within group Pearson correlation coefficient (r) was conducted to test for the strength of the relationship for pretest and posttest grit and CDSE mean scores within the control group and treatment group independently. Positive moderate relationships were identified within the control group between posttest grit and pretest CDSE ($r = .443$, n=42, $p = .003$) and between posttest grit and posttest CDSE ($r = .462$, n = 42, $p = .002$). A Pearson correlation coefficient was also conducted within the treatment group to test for strength of relationships between the dependent variables. Pretest grit and pretest CDSE ($r = .479$, n = 53, $p = .000$), pretest CDSE and posttest grit ($r = .445$, n = 53, $p = .001$), and posttest CDSE and posttest grit ($r = .462$, n = 53, $p = .000$).

Based on these analyses, the statistics show that the relationship between grit and CDSE is weak to moderate. This provided evidence that the two constructs which are often used as predictors of academic success may be weakly correlated and should be viewed independently.

Question 2. What is the difference in grit score for college students who participate in a one credit CSC embedded with grit lessons versus those who do not participate in grit lessons?

To determine if there was a statistically significant difference in grit scores for college students who participate in a one credit CSC embedded with grit lessons versus those who do not participate in grit lessons an ANCOVA was conducted. There is a statistically significant effect between the groups identified in posttest scores after controlling for pretest score variance, $F(1,93) = 5.62$, $p = .02$. The Partial Eta Squared ($\eta_p^2 = .58$) was calculated indicating a small effect size as noted in Table 8. The primary researcher is 98% confident that the posttest grit scores for individuals within the treatment group are between .026 to .295 points higher than those in the control group. To better understand the effect size of the intervention, effect size was also calculated. An effect size, when reported as Cohen's d, is considered small at .20, medium at .50, and strong at .80 (Sprinthall, 2012). According to Sprinthall (2012), effect size can be calculated when differences in mean exist to quantify the effectiveness of an intervention. The effect size (Cohen's $d = .24$) of the treatment condition revealed the CSC treatment condition did have a small positive effect on the change in mean scores of students.

Question 3. What is the difference in career decision self-efficacy scores for college students who participate in a one credit CSC embedded with grit lessons course versus those who do not participate in grit lessons?

To determine if there was a statistically significant difference in CDSE scores for college students who participated in a one credit CSC embedded with grit lessons versus those who do not participate in grit lessons an ANCOVA was conducted. There was no statistically significant difference $F(1,93) = .032$, $p = .859$ between the groups identified in posttest scores after controlling for pretest score variance.

Discussion of Results

Based on the MANOVA results for the dependent variable of grit and CDSE, there was not a statistically significant relationship identified for the study participants in the control and treatment group collectively. However, when independent analysis was conducted on the control and treatment groups utilizing the Pearson correlation coefficient, there was a moderate relationship identified between posttest grit and pretest CDSE as well as between posttest grit and posttest CDSE. This finding raises several further questions because the mean grit score for the control group remained the same for pretest and posttest values.

When the Pearson correlation coefficient analysis was conducted for the treatment group, positive moderate relationships were identified between pretest grit and pretest CDSE, pretest CDSE and posttest grit, and between posttest CDSE and posttest grit. While these results may encourage one to conclude the relationship between grit and CDSE is low to moderately correlated, based on the evidence within this study, grit and CDSE should be viewed as independent constructs which may have a slight to moderate positive correlation to one another.

When looking at the construct of grit independently as in the second research question, the application of the treatment condition did show a positive small effect on grit scores for treatment participants versus no gains in mean grit scores for the control group. While further research needs to be conducted to understand the construct of grit and how to develop it in individuals, the short-term 7-week treatment intervention within the CSC did yield some positive and potentially promising results. If these results provide treatment participants with a long-term benefit remains to be seen and is not within the scope of this study. "Duckworth (2013), who has spent years studying children and adults in various demanding settings, has asked the question, who is successful and why?" (Lyons 2014, p. 38). According to Duckworth (2009), it can take years to cultivate and "prove one's grittiness". While the development of traits related to effort and interest are constantly being developed over long periods of time, the short-term CSC academic intervention did yield short-term gains in grit as measured by the 12 item Grit Scale. Peterson and Seligman claim that character is entirely changeable and malleable which also supports Carol Dweck's (2006) concept of growth mindset which was a component of the treatment curriculum. "Character traits are skills you can learn; they are skills you can practice; and they are skills you can teach" (Tough, 2012, p.59). This research study provides further evidence that traits related to grit are teachable in the context of a college level credit bearing career success course (CSC) intervention.

Career decision self-efficacy scores did not show statistical significance between the control and treatment groups. While the original curriculum for the Introduction to Business course, which served as the control condition, was developed to support student success in choosing an appropriate course of study within the business curriculum, pretest and posttest

CDSE was not previously measured. While not a primary focus of this research, it did provide evidence that the control condition did have slight to moderate gains for participants in mean CDSE scores. Even more interesting were parallel positive gains in scores identified for the mean CDSE scores in the treatment group which participated in the treatment curriculum designed to foster qualities related to grit.

Limitations

One identified limitation is that the study did not utilize random sampling to select participants for control and treatment condition. Convenience sampling was utilized establishing a quasi-experimental research, nonequivalent comparison-group design. This design was chosen because random assignment of individuals to treatment groups was not practical since participation in the study is voluntary and students are assigned to course sections based on availability in their academic schedule. Because pre-established classes could not be randomly assigned, convenience sampling was used to establish treatment and control groups. The use of pretest controls for any differences between the treatment group and the control group was examined. Because the sampling was not randomized, special consideration to internal and external validity was necessary (cook & Campbell, 1979). Non-randomization of participants reduces internal validity, making causal claims difficult to make.

Purposive sampling was used to identify classroom facilitators to advance the treatment condition and this is a non-random sampling method and, therefore, a limitation for this study (cook & Campbell, 1979). However, the design of this study was optimized by establishing specific protocol for curriculum implementation with weekly reviews of the upcoming week's curriculum and lesson plan for the two facilitators of the treatment condition.

While non-random assignments may be the least obtrusive in an educational setting, it does carry potential threats to internal validity, such as maturation and selection. While the maturation effect is important to note, the experiment was implemented over a 7-week period. The total sample size for this research included 95 participants (n = 95), the control group (n = 42), and the treatment group (n =53); therefore, higher levels of voluntary participation were expected. The limitation of a small sample size impacted the generalizability of this study's results. Black (1999) discussed these limitations and the effect on interpreting the results of any population outside of the one studied. For this reason, inferences to a broader population are not made.

An inherent limitation of both instruments used in this study was the self-reported method for gathering DV data. However, self -report questionnaires are arguably better suited than any other measures for assessing internal psychological states such as feelings of belonging (Duckworth &Yeager, 2015).

Theoretical Implications

In consideration of the many challenges associated with college student academic success, matriculation, and career decision making throughout the college experience, Bandura's Social Learning Theory and concept of self-efficacy provide a theoretical basis to further investigate the development of traits related to grit within the context of a classroom career development intervention. Bandura's focus on attention and motivation within Social Learning Theory are further explored in the concept of self-efficacy. Where self-efficacy focuses on

internal cognitive beliefs about an individual's ability to perform a task, grit is associated with the behavior of whether to persist in pursuit of the task or long-term goal.

This study was within the context of a one credit college career course which has been well researched in the literature and identified as an increasingly popular and cost effective intervention as noted in Folsom's et al. (2005) study on the outcomes and effectiveness of college career courses. Further studies also identified increases in career decision self-efficacy as an appropriate outcome for such courses which are recommended to include three of five effective career interventions as identified by Brown and Kane (2000) including; goal setting, individual feedback, risk/reward of career choice, mentoring, and networking. More recent research by Seligman (2014) focuses on theories of well-being and positive psychology which emphasize the importance of positive relationships (mentoring, individual feedback, networking), motivation, self-regulation, and character strengths have all been shown to have a positive impact on long term success in an individual's personal life, academic endeavors, and career. Historically, non-cognitive factors have largely been viewed as stable throughout a lifetime, however new research illustrates that many of these personality traits may be malleable throughout a person's life as Dweck (2006) has shown through her research on mindset. This current study also provides evidence for these claims.

This study and the three guiding research questions integrated the concept of teaching non-cognitive skills, specifically grit, into the college academic career course. The traditional Introduction to Business course, which served as the control condition included at least three of the five career course interventions as noted by Brown and Kane (2000). However, CDSE was not historically measured as an outcome for the course which has been part of the business curriculum for the past four years. This research study did show that pretest-posttest results showed a gain in mean CDSE scores (pretest $M = 3.75$, $SD = .548$; posttest $M = 3.94$, $SD = .618$) for the control group. While there was no statistical significance identified between the control and treatment intervention for CDSE, this evidence further supports the pre-existing literature on college level career course intervention effectiveness.

The treatment condition, or grit lessons, integrated curriculum related to the development of a student's educational interests and the persistent effort necessary to achieve one's long term education and career goals. The primary components of the Introduction to Business course remained and were modified and embellished with mindset, positive psychology, resiliency, self-awareness, and character strength curriculum. This modified curriculum served as the treatment condition or CSC as referred to throughout this research study. Pretest-posttest results for CDSE within the treatment group also increased mean scores (pretest $M = 3.53$, $SD = .708$; posttest $M = 3.84$, $SD = .654$). This finding raises interesting questions as to the influence of grit curriculum on CDSE scores which may need further study and analysis. However, based on these findings, it does support the idea that areas of non-cognitive traits may correlate with one another and may have influence in CDSE and grit assessment measures.

To explore this potential interaction between CDSE and grit, the results of the MANOVA were used to determine whether there are any differences between two or more groups of an independent variable (control and treatment) on more than one continuous dependent variable (grit and CDSE). The result of this analysis did not show a statistically significant relationship between the two constructs ($p = .783$). Based on this evidence, grit and CDSE should be viewed as independent constructs with independent measures. When further within group analysis was conducted using the Pearson correlation coefficient, there were some pretest and posttest scores for grit and CDSE that showed a slight to moderate correlation. It is important to note that

correlation does not imply cause and effect, and grit has been identified throughout the literature as being strongly correlated to other personality constructs such as conscientiousness within the Big Five personality traits. Additional examples of psychological non-cognitive constructs positively correlated with grit have been hardiness, perseverance, and need for achievement. Throughout the literature, many of these areas have also been positively correlated with self-efficacy (Phillips & Gully, 1997). Little to no research in the literature has been identified which directly analyzed the relationship between grit and CDSE.

Grit is a non-cognitive construct which has been receiving significant attention especially with the recent release of Angela Duckworth's (2016) book, Grit: The Power of Passion and Perseverance. This publication highlights the ten plus years of research Duckworth has dedicated to the construct. "Researchers are currently at the point where they are trying to figure out what factors influence grit and its development" (Lyon, 2014, p.44). Factors such as growth mindset, delayed gratification and experiencing failure while sustaining deliberate practice towards the accomplishment of a long-term goal all contribute to the influential characteristics within grit. This research study aimed to provide some evidence of classroom interventions which showed some promise in the development, or at least the introduction, of concepts related to these personal attitudes and traits influencing grit as recommended in the U.S. Department of Education's (2013) study, "Promoting grit, tenacity, and perseverance: Critical factors for success in the 21st Century". Within this study, the 7-week treatment intervention did show some promising evidence of positive small effect size (Cohen's d = .24) in mean grit scores for the treatment group versus no significant effect for the control group.

Practical Implications

This study sought to determine the relationship between grit scores and CDSE scores for college students who participate in a one credit CSC embedded with grit lessons versus those who do not participate in grit lessons. Changes in grit and CDSE scores were also investigated for the control and treatment conditions.

Post-secondary career professionals may be interested in further exploring the importance of non-cognitive skill development programs and measures to support student success through college level career interventions. Historically, career interventions have typically relied on exercises related to resume/cover letter development, interviewing skills, labor market information, and networking. Practical implications of this study provide evidence that academic based classroom curriculum on career and non-cognitive skill development may help to nurture components of a student's character by focusing on an individual's strengths and level of persistent effort in achieving college and career related goals. Intentional and purposeful focus on career interventions related to non-cognitive skill development can be a new purview or direction for career professionals to address while students acquire content specific knowledge and cognitive skills through their traditional academic college experience. This approach may also lend itself to the holistic approach career professionals assume when helping students to connect a broad array of college experiences, both curricular and co-curricular, with the vast amount of industry and career information at their fingertips. As Gati (1996) and Folsom &Reardon (2001) emphasized, colleges and universities should be assisting students in resolving career decision-making difficulties as they integrate large amounts of information involving self and the world of work.

This study also has practical implications to the development and implementation of curriculum designed to nurture qualities related to grit for those interested in further exploring successful interventions. Within this specific study, primary resources for the development and implementation of the treatment condition, or grit lessons, were modified concepts from growth versus fixed mindset (Dweck, 2006), positive psychology, (Seligman, 2011), non-cognitive skills (Tough, 2012), and a variety of motivation studies addressing the importance of autonomy, mastery, and purpose (Pink, 2009).

Lastly, this study provides evidence that CDSE and grit are standalone constructs which may be slightly to moderately correlated. While there may be significant overlap among many non-cognitive traits, future research should carefully consider the methods and treatments which focus on the specific construct of grit and CDSE interventions. This research study provides evidence that while increases in CDSE were realized by both control and treatment groups, mean gains in grit scores were only realized by the treatment group. So, while the CDSE scores increased proportionately for both control and treatment, the treatment condition, or grit lessons, did show a small positive effect on mean grit scores with no mean gains for the control group.

Conclusions

This study sought to determine the relationship between grit scores and CDSE scores for college students who participate in a one credit CSC embedded with grit lessons versus those who do not participate in grit lessons. Changes in grit and CDSE scores were also investigated independently. Quantitative data analysis revealed that when accounting for all participants within control and treatment groups, there was not a statistically significant relationship between the two constructs identified. However, when control and treatment groups were analyzed independently, slight to moderate positive correlations were identified between pretest and posttest results related to the specific constructs of grit and CDSE.

The treatment group showed gains in mean grit scores with a small effect size for the development of traits related to grit. The control group showed no gains in mean grit scores. Scores for both the treatment and control conditions showed increases in mean CDSE scores indicating that the control and treatment condition curriculum had a positive impact on CDSE scores for participants; however, these gains were not identified as statistically significant.

An emerging recognition for the importance of non-cognitive skills to an individual's long-term success raises new challenges for our education system to explore in effectively preparing our future generations for success in school, career, and beyond. As our society and the individuals within it face increasingly complex challenges from the personal to global perspective, preparing our youth and young adults to address these mounting concerns will not only be a matter of the application of knowledge, but it will also require individuals with strong character who do not become discouraged by repeated failures or setbacks. While non-cognitive skill development is by no means the singular solution to these challenges, it is this researcher's hope that this study can positively contribute to improving the education field, our human condition, and opportunities for the future.

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APPENDIX

Figure 1. Quasi-Experimental Design. From Creswell, J. W. (2008). *Educational research: Planning, conducting, and evaluating quantitative and qualitative research*. Upper Saddle River, N.J: Pearson/Merrill Prentice Hall.

Group A O--------X-------O
- - - - - - - - - - - -
Group B O----------O

Table 1. *Comparison of Control and Treatment Curriculum by Class*

Class Number	Introduction to Business (Control)	Introduction to Business (CSC, Treatment)
Class 1	Course Overview College big picture Information literacy assessment Voluntary research participation Demographic sheet Grit pretest CDSE pretest	Course Overview College big picture Information Literacy assessment Voluntary research participation Demographic sheet Grit pretest CDSE pretest
Class 2	CareerLeader assessment	CareerLeader assessment VIA Character Strengths assessment
Class 3	Public Speaking and Self-Advocacy, Module #1	Introduction to Growth Mindset Mindset Video Establish course working groups "Tarp Exercise"/group reflection Module #1-Self-Advocacy Introductions
Class 4	CareerLeader Interpretation Career Ingredients	CareerLeader and VIA interpretation Career/VIA ingredients Introduce "Tower Activity Roles" based on career/VIA ingredients
Class 5	Action Plan Development/Mentoring	"Tower Activity" and group reflection Self-advocacy purpose statement Effort and Interest paper assignment review
Class 6	SMART Goals	SMART Goals "Role Juggling Activity"/Group reflection
Class 7	Public Speaking and Self- Advocacy, Module #2	Self-Advocacy STAR story Career Ingredients/Life Challenges Module #2
Class 8	Resume Development	Resume Development Self-Advocacy Presentation Outline
Class 9	Public Speaking Self-Advocacy, Module #3	Module #3 Self advocacy presentation Presentation Practice within group
Class 10	Internship Resources /Test Review	Test Review
Class 11	Test/Research post testing	Test/Research post testing
Class 12	Student Self-Advocacy Presentations	Student Self-Advocacy Presentations
Class 13	Student Self-Advocacy Presentations	Student Self-Advocacy Presentations
Class 14	Student Self-Advocacy Presentations	Student Self-Advocacy Presentations
Class 15	Student Self-Advocacy Presentations	Student Self-Advocacy Presentations

Table 2. *Selected Demographic of Group by Number and Percentage*

	Control Group		Experimental Group	
Demographic	n	%	n	%
Gender	42		53	
Male	25	59.5	39	73.6
Female	17	40.5	14	26.4
Age	42		53	
18-20	31	73.8	46	86.8
21-24	6	14.3	7	13.2
25-34	5	12.0	0.0	0.0
Ethnicity	42		53	
Caucasian American	27	64.3	45	84.9
Black American	3	7.1	1	1.9
Hispanic	3	7.1	3	5.7
Asain American	1	2.4	1	1.9
Saudi	6	14.3	3	5.7
Other	1	2.4	0.0	0.0
Missing Data	1	2.4	0.0	0.0

Table 3. *Selected Demographic of Group Academic and Career Characteristics by Number and Percentage*

	Control Group		Experimental Group	
Demographic	n	%	n	%
Academic Year	42		53	
Freshmen	24	57.1	43	81.1
Sophomore	12	28.6	7	13.2
Junior	5	11.9	2	3.8
Senior	0	0.0	1	1.9
Other	1	2.4	0	0
Area of Study	42		53	
Accounting	14	33.3	17	32.1
Finance	3	7.1	5	9.4
Human Resource Managment	3	7.1	4	7.5
Management	9	21.4	11	20.8
International Business	2	4.8	3	5.7
Marketing	6	14.3	9	17
Other	3	7.1	1	1.9
No Data	2	4.8	3	5.7
Major Choice Status	42		53	
Undecided	2	4.8	1	1.9
Tentatively Decided	4	9.5	10	18.9
Decided	35	83.3	42	79.2
Missing Data	1	2.4	0	0
Career Choice Status	42		53	
Undecided Career	10	23.8	17	32.1
Tentatively Decided Career	17	40.5	29	54.7
Decided Career	15	35.7	7	13.2

Table 4. *Tests of Normality*

Tests of Normality

	group	Kolmogorov-Smirnov[a]			Shapiro-Wilk		
		Statistic	df	Sig.	Statistic	df	Sig.
Pregrit	control	.112	42	.200*	.972	42	.382
	treatment	.087	53	.200*	.980	53	.501
Postgrit	control	.070	42	.200*	.982	42	.746
	treatment	.096	53	.200*	.978	53	.437
CDSEpre	control	.079	42	.200*	.983	42	.790
	treatment	.083	53	.200*	.983	53	.632
CDSEpost	control	.128	42	.082	.959	42	.138
	treatment	.074	53	.200*	.977	53	.408

a. Lilliefors Significance Correction

*. This is a lower bound of the true significance.

Table 5. *Descriptive Statistics*

	Group	N	Mean	Std. Deviation	Min	Max	Range
Pregrit	Control	42	3.44	0.515	2.16	4.33	2.17
	Treatment	53	3.44	0.491	2.00	4.42	2.42
Postgrit	Control	42	3.43	0.496	2.33	4.33	2.00
	Treatment	53	3.59	0.409	2.75	4.50	1.75
CDSEpre	Control	42	3.75	0.548	2.70	5.00	2.30
	Treatment	53	3.53	0.708	1.70	5.00	3.30
CDSEpost	Control	42	3.94	0.618	2.70	5.00	2.30
	Treatment	53	3.84	0.654	2.20	5.00	2.80

Figure 3. Grit Pretest-Posttest Histogram

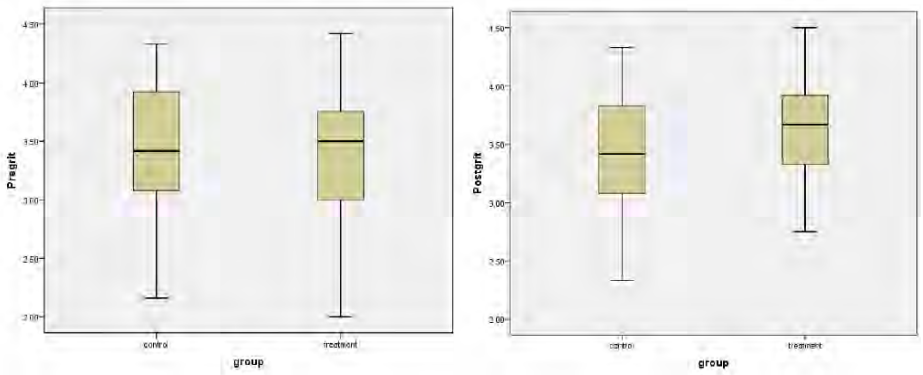

Figure 4. CDSE Pretest-Posttest Histogram

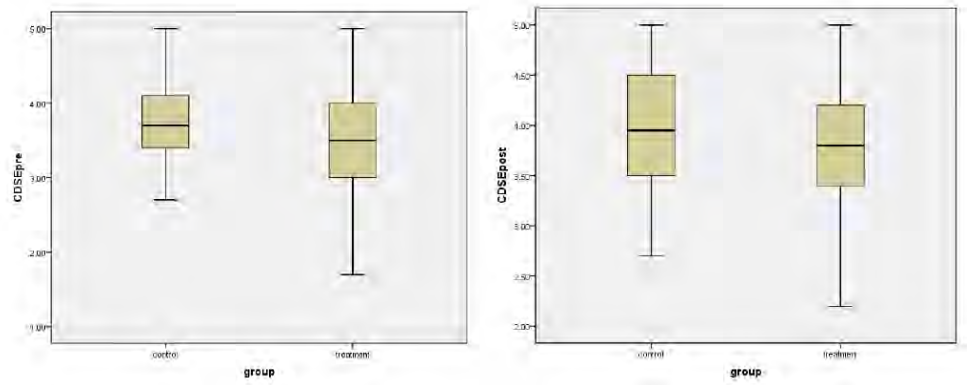

Table 6. *Control Group Pearson Correlation Coefficient for Pretest and Posttest Grit and CDSE Scores*

Correlations

		Pregrit	Postgrit	CDSEpre	CDSEpost
Pregrit	Pearson Correlation	1	.753**	.194	.245
	Sig. (2-tailed)		.000	.219	.117
	N	42	42	42	42
Postgrit	Pearson Correlation	.753**	1	.443**	.462**
	Sig. (2-tailed)	.000		.003	.002
	N	42	42	42	42
CDSEpre	Pearson Correlation	.194	.443**	1	.644**
	Sig. (2-tailed)	.219	.003		.000
	N	42	42	42	42
CDSEpost	Pearson Correlation	.245	.462**	.644**	1
	Sig. (2-tailed)	.117	.002	.000	
	N	42	42	42	42

**. Correlation is significant at the 0.01 level (2-tailed).

Table 7. *Treatment Group Pearson Correlation Coefficient for Pretest and Posttest Grit and CDSE Scores*

Correlations

		Pregrit	Postgrit	CDSEpre	CDSEpost
Pregrit	Pearson Correlation	1	.627**	.479**	.344*
	Sig. (2-tailed)		.000	.000	.012
	N	53	53	53	53
Postgrit	Pearson Correlation	.627**	1	.445**	.462**
	Sig. (2-tailed)	.000		.001	.000
	N	53	53	53	53
CDSEpre	Pearson Correlation	.479**	.445**	1	.505**
	Sig. (2-tailed)	.000	.001		.000
	N	53	53	53	53
CDSEpost	Pearson Correlation	.344*	.462**	.505**	1
	Sig. (2-tailed)	.012	.000	.000	
	N	53	53	53	53

**. Correlation is significant at the 0.01 level (2-tailed).

*. Correlation is significant at the 0.05 level (2-tailed).

Table 8. *ANCOVA Results for Pretest Posttest Grit Scores*

Parameter Estimates

Dependent Variable:Postgrit

Parameter	B	Std. Error	t	Sig.	95% Confidence Interval		Partial Eta Squared	Noncent. Parameter	Observed Power[a]
					Lower Bound	Upper Bound			
Intercept	1.474	.238	6.203	.000	1.002	1.945	.295	6.203	1.000
Pregrit	.616	.068	9.092	.000	.482	.751	.473	9.092	1.000
[group=1]	-.161	.068	-2.370	.020	-.295	-.026	.058	2.370	.650
[group=2]	0[b]	.	.	.	.	.	.	.	.

a. Computed using alpha = .05

b. This parameter is set to zero because it is redundant.

Table 9. *ANCOVA Results for Pretest-Posttest CDSE Scores*

Tests of Between-Subjects Effects

Dependent Variable:CDSEpost

Source	Type III Sum of Squares	df	Mean Square	F	Sig.	Partial Eta Squared	Noncent. Parameter	Observed Power[b]
Corrected Model	11.845[a]	2	5.922	20.716	.000	.311	41.433	1.000
Intercept	9.977	1	9.977	34.898	.000	.275	34.898	1.000
CDSEpre	11.600	1	11.600	40.576	.000	.306	40.576	1.000
group	.009	1	.009	.032	.859	.000	.032	.054
Error	26.301	92	.286					
Total	1469.090	95						
Corrected Total	38.146	94						

a. R Squared = .311 (Adjusted R Squared = .296)

b. Computed using alpha = .05

Table 10. *Descriptive Statistics Summary*

	Group	N	Mean	Std. Deviation	Min	Max	Range
Pregrit	Control	42	3.44	0.515	2.16	4.33	2.17
	Treatment	53	3.44	0.491	2.00	4.42	2.42
Postgrit	Control	42	3.43	0.496	2.33	4.33	2.00
	Treatment	53	3.59	0.409	2.75	4.50	1.75
CDSEpre	Control	42	3.75	0.548	2.70	5.00	2.30
	Treatment	53	3.53	0.708	1.70	5.00	3.30
CDSEpost	Control	42	3.94	0.618	2.70	5.00	2.30
	Treatment	53	3.84	0.654	2.20	5.00	2.80