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USING GROWTH MINDSET STRATEGIES IN GATEWAY COMPOSITION COURSES

A DISSERTATION APPROVED FOR THE
DEPARTMENT OF EDUCATIONAL LEADERSHIP AND POLICY STUDIES

BY THE COMMITTEE CONSISTING OF

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Table of Contents

List of Tables 7

List of Illustrations 8

Abstract 9

Chapter 1: The Need for Retention Efforts and Increased Enrollment 11

Higher Education Funding 13

Statement of the Problem 16

Chapter 2: Review of Literature 21

Current University Retention Efforts 23

Orientation Courses 26

University Boot Camp 26

Faculty Mentoring 27

Early Alert Systems 28

Academic Tutoring 30

Fostering a Growth Mindset 32

Chapter 3: Theoretical Framework 33

Impact of Growth Mindset on Low Socioeconomic Students 34

Using Growth Mindset to Increase Student Motivation and Confidence 36

Current University Growth Mindset Treatments and Strategies 39

Growth Mindset Research Design 40

Midwest University 44

Midwest University Student Services 45

Intervention 47

Brain Neuroscience and a Fixed Versus Growth Mindset 48
The Power of Yet 49
Process Oriented Feedback and Scaffolding 50
Learning Through Failure and Embracing Setbacks 53
Practice, Determination, Taking Risks and Accepting Challenges 55
Journal Writing and Developing Autonomy 57
Building Faculty Relationships and Connectivity with HELP Conferences 59
Chapter 4: Method 64
Restatement of Purpose 64
Data Sources and Collection Procedures 66
Data Analysis Approach 73
Chapter 5: Results and Findings 75
Growth Mindset Intelligence and Talent Domains 75
Writing Enjoyment and Increased Confidence 82
Content Assessment Scores 93
The Demographic Impact on Outcomes 100
Chapter 6: Discussion and Conclusion 103
Implications for Policy and Practice 110
Limitations 111
References 115
Appendix A--Study Measures 147
Appendix B—Course Schedule and Growth Mindset Treatment 153
Appendix C: Using Growth Mindset in Gateway Courses Data Code Book 162

List of Tables

Table 1. Neuroscientific Evidence of Growth Mindset and Intrinsic Motivation 37

Table 2. Student Demographic Institutional Fact book, 2017 67

Table 3. Treatment and Control Student Demographics 68

Table 4. Paired t-test of Treatment Change in Intelligence, Talent Mindset Domains .. 76

Table 5. Paired t-Test Comparison of Writing Domain Pre and Post Tests 82

Table 6. Midwest University Treatment Group Writing Enjoyment and Confidence 88

Table 7. Paired t-Test of Treatment Group Change in Content Assessment Scores 94

Table 8. Paired t-Test of Control Group Change in Content Assessment Scores..... 95

Table 9. OLS Regression of Change in Content Assessment by Treatment/Control 96

Table 10. OLS Regression of Treatment Group Pre-Post Differences in Growth Mindset Domains by Student Demographics..... 101

List of Illustrations

Figure 1. Theory of Action……....42

Figure 2. Plot of Treatment versus Control Group Change in Content Assessment Scores…..... 94

Figure 3. Plot of Treatment versus Control Group Pre and Post-Test Assessment Scores……. 95

Abstract

University enrollment rates have continued to decline and increasing retention efforts on campuses has become a central focus for university administration and faculty members. Growth mindset, a theory developed by Dr. Carol Dweck, is a belief that intellectual and academic ability are not "fixed" but instead can be developed by a student's hard work and determination. The danger of a fixed mindset is that students who believe that their intellect is a fixed trait are much more likely to have lower academic performance, decreased motivation, and are at-risk for dropping out of school (Bickerstaff, Barragan & Rucks-Ahidiana, 2012; Cury, Elliot, Da Fonseca, & Moller, 2006; Kornilova, Kornilova, & Chumakova, 2009; Skipper & Douglas, 2012). Often, students with a fixed mindset cannot achieve academic success because they believe that they are incapable of meeting academic performance goals (Sousa & Tomlinson, 2011). When students develop a growth mindset it can increase motivation, the desire to learn, and greatly impact school achievement (Dweck, 2007; Kornilova et al., 2009; Spinath, Freudenthaler, & Neubauer, 2010; Steinmayr & Spinath, 2009).

The concept of improving academic ability, from the standpoint of retention purposes and overall student success, is very timely as university enrollment currently faces a downward trend. In addition, more students are beginning their university careers underprepared academically, and their success or failure in a gateway course can often be determined, not by their ability, but by their mindset. The purpose of this research is to examine how growth mindset strategies affect university students in a composition gateway (general education) course. This impact evaluation study was conducted over the course of a sixteen-week semester and targeted 150 Composition I students, in nine separate courses, at a regional university located in the Midwest. Central to the study is the use of ten growth mindset strategies that were introduced weekly in the course

during the duration of the semester. A control group of 69 students, who were not exposed to growth mindset strategies, was established at the beginning of the study. All of the composition students in the study were given a survey measuring growth mindset, a writing survey, and a course content assessment that were administered at both the beginning and at the end of the course. After examining the data and the results of the surveys, this research would suggest that using growth mindset in a gateway course, particularly in writing courses, might help students enjoy the writing process more, might lead to better student academic success and higher retention rates, and might be beneficial for first generation students and students from low socioeconomic backgrounds in particular.

Chapter 1: The Need for Retention Efforts and Increased Enrollment

Even though more students now begin college than in years past, enrollment numbers continue to decline at institutions across the nation, and this decline is due to competition within the university marketplace. Contributing to this enrollment crisis is the fact that the United States birth rate will remain low for the next 10 years, and additionally, universities are feeling the full impact of Neoliberalism, which views education as a way for students, or customers, to buy a product that will increase their job market prospects (Saunders, 2007; Treanor, 2005). This movement operates on the premise that colleges should exist solely for the purpose of finding a job that increases wealth and status, and there is also a growing belief that having skill set knowledge is more important than obtaining a college education (Kasriel, 2018). Additionally, lawmakers, parents, and students have questioned whether higher education offers an adequate return on the steep financial investment (Arum & Roksa, 2011). This growing Neoliberalism has negatively impacted how lawmakers fund higher education, and it has also created a student population that is not fully motivated to attend college.

The concept that everyone should go to college is a rather new premise. In fact, when Harvard was founded in 1636, college was used only as a pathway into the clergy, law or medical fields. Anderburg (2018) notes that by 1700, the cost of tuition was “about 10 shillings per quarter, which amounted to the cost of about a pair of shoes and two pairs of stockings” (para. 16). The expense of college was not an issue for most of the families, but most colonist were not willing to invest in an education because they would lose years of having their sons work to help earn money for the family (Anderberg, 2018). Typically, only elite, wealthy families sent their offspring to a university, and often the time spent there was based more on social status than educational pursuits.

The notion that college is only for the wealthy, elite, or the highly intelligent citizen completely changed with the increased availability of student aid, which encouraged everyone, no matter their academic ability or financial status, to attend college (Thelin, 2011). In years past, most institutions actively worked to weed out students from college programs. The thinking was that not every student was college material, and therefore, should not waste their time, or the college's time in seeking a degree. This selectiveness and exclusivity were actually part of the academic excellence process that was touted by many universities.

Contrary to the prevailing university ivory tower mentality, President Obama began his term with a focused mission to increase the number of college graduates (Lederman & Fain, 2017; Matthews, 2013). In 2009, in a speech to a joint session of Congress, he stated that "By 2020, America will once again have the highest proportion of college graduates in the world" (Wood, 2012, para. 1). This was a lofty goal considering only 56% of students graduated from college during this time period. However, the number of students heading off to universities kept increasing, and by 2013, 14 million students were enrolled in 4-year institutions (Anderberg, 2018). Because all students were adamantly encouraged to go to college, universities have been inundated with students who are underprepared, both academically and emotionally; this trend has created the need for intensive student retention services. Students typically arrive at college with varying backgrounds and diverse academic abilities (Laskey, 2004). Fike and Fike (2007) found that 41% of students entering a community college, and 29% of students who enter any college, are not prepared to meet the basic skill requirements for core subjects such as reading, writing, and mathematics.

Research suggests that students who are academically prepared for college can still be difficult to retain (Farrington, Roderick, Allensworth, Nagaoka, Keyes, Johnson, & Beechum,

2012), and the data from Norris (2014) highlights that many new American high school graduates are simply not choosing a college path. In fact, in October of 2014, "just 65.9 percent of people who had graduated from high school the previous spring had enrolled in college…that was down from 66.2 percent the previous year and was the lowest figure in a decade. The high point came in 2009, when 70.1 percent of new graduates had gone on to college" (Norris, 2014, para. 1-2). The rise in college enrollment occurred in 2009, which was directly correlated with the federal expansion of Obama's North Star Pell grant program; this rapid growth created university campuses that vastly overbuilt for the student population that currently exists.

Higher Education Funding

The decrease in student enrollment has compounded the financial issues for many universities, and even worse, these dwindling revenue collections, compounded with the state tax cuts, have created major revenue shortfalls for higher education institutions (Murphy, 2015; Weerts, 2014). The lawmakers in several states have voted to defund public education, and while the cuts to common education have received nationwide attention, the cuts to higher education have been more severe and disproportionate to other state cuts. One such state to receive vast higher education funding cuts is Oklahoma, which is the state that currently ranks #50 in the nation for the amount of state allocations made for higher education funding. *The Oklahoma Watch* reported that the State Regents for Higher Education only were "appropriated $773.6 million, a nearly 4-percent reduction from the current fiscal year after mid-year revenue failures are taken into account," and for the 2017 fiscal year, the agency, "which provides funding to state public colleges and universities, is on track to receive $805 million, roughly 13 percent less than the $928 million it received in 2016…in 2016 and almost every year since, colleges and universities had to increase tuition and fees an average of 8.5 percent to offset those cuts"

(Brown, Palmer, Bryant, & Vieth, 2017, para. 21). Unfortunately, these increases have a long-term impact on students, and the rising cost of tuition makes it exceedingly more difficult to increase enrollment numbers.

One reason for the focus on student retention, and probably the most significant, is the changing educational marketplace. Universities have had to endure state budget cuts, federal funding scrutiny, and increased competition from public, private, and for-profit universities. There has also been a backlash from the public regarding student debt and the rising cost of tuition, and the steep tuition and increased number of underprepared students has created a growing retention problem for American universities (Roderick, Nagaoka, & Coca, 2009). Administrators and faculty have encountered woefully underprepared students who come from much more diverse populations, and many of these students now need focused remediation, while simultaneously demanding accessibility to online and technology-based courses.

To keep up with these educational demands, higher education institutions have moved toward a corporate business model that perceives the student as a customer, which, in turn, has caused resentment amongst faculty members (Allen, 2003; Ayers, 2009; Bess & Dee, 2014; Boggs & McPhail, 2016; Esterberg & Wooding, 2012; Kezar, 2014; Kezar & Eckel, 2002). This new business model focuses on meeting the needs of the student so that they continue to enroll in courses because increasing the enrollment numbers of additional new students is not enough to ensure fiscal survival. Universities have had to actively implement targeted programs to retain the current student population, and at many institutions, the student population is woefully underprepared to be academically successful. Because retention is imperative for fiscal viability, and retaining students requires providing available and useful resources, it is critical that many universities increase retention and enrollment rates as a result of these financial concerns.

As university enrollment has continued to decline, it has become increasingly more important for university administrators to find new and innovative ways to retain students, especially considering that universities are tied to a performance-based funding structure (Tandberg, & Hillman, 2014). In fact, the changing economic market has increasingly made higher education institutions react to a demand driven workforce, so universities must now offer degree programs that the workforce demands (Hemsley-Brown & Oplatka, 2006). It has been difficult for universities to make the necessary changes to meet external demands. In fact, higher education institutions have been described in the past as organized anarchy, which can make systemic change difficult to accomplish (Cohen & March, 1974). However, the economic situation has created challenges for higher education institutions that cannot be ignored; administrators have quickly realized that they must be cognizant of changing student attitudes regarding higher education because there are fewer students enrolling. With shrinking external resources and funding, universities are now operating in a more competitive marketplace and must strategize to focus on institutional strengths (Layzell, 1992; Liefner, 2003).

The changing education marketplace has also created a diversity in the pool of students who now enroll in college courses. Traditionally, only academically proficient or advanced students attended college, but the new marketplace caters to diverse student populations who are often under prepared academically. There are also more universities, both private and public, and additionally, there are increasing numbers of online universities. The competition for students is fierce. Universities must make every effort possible to recruit and retain students. Secondly, new government funding standards have changed how universities view student matriculation. Federal funding once focused on obtaining high enrollment numbers, but the shift has been towards performance-based standards, and “more than 75 percent of states use a performance-

based funding initiative, with some states basing 100 percent of their funding on graduation rates" (Sousa, 2019, para. 6). Accreditation standards have also become tied to student success, and the Obama administration mandated that accreditation standards should be based on items such as college affordability and student outcomes (Sousa, 2019). The government mandates have made student retention and graduation rates a central measurement for procuring federal funding.

Statement of the Problem

To combat these problems, universities, including for-profit institutions, now recognize that the best strategy for boosting enrollment is to retain the students they currently have. Many different retention strategies are being studied and implemented. As Boylan (2009) stated, "postsecondary institutions must serve the students they have, not those they wish they had" (p. 20). Put simply, it is easier to keep existing students, even those who are academically underprepared, than to find a pool of new students who can afford the high cost of tuition. As stated, there are several components involved in the move towards retention-based efforts that include significant decreases in state allocations, changes in the student population or education marketplace, changes in federal government allocations, and the cost savings associated with university retention efforts. These factors have made it necessary to implement retention strategies that may help underprepared students become academically successful.

Growth mindset, a theory developed by Dr. Carol Dweck, is a belief that intellectual and academic abilities are not "fixed" but instead can be developed by a student's hard work and determination. Many students, especially under-prepared, first-generation, and low socioeconomic status students, tend to enter college with a fixed mindset (Blue, Johnson, Summerville, & Kirkmeyer, 2018). The research has shown that academic achievement is very

much influenced by psychological factors and that a student's belief about his or her own ability can be central to achieving academic success (Claro, Paunesku, Dweck, 2016; Dweck 2006; Dweck 2007; Dweck 2010b; Hochanadel & Finamore, 2015).

Universities have become increasingly focused on student retention, so it is necessary to teach students to change their negative views on their learning ability and to reframe their past experiences regarding academic failure. Many lower performing students have encountered difficulties in both home and school settings, and these events negatively impact the students' perceptions regarding learning and coping with academic challenges (Dweck, Walton, & Cohen, 2014; Dweck 2006). In addition, more students are beginning their university careers underprepared academically, and for various reasons, only approximately 60% of students who enroll in college coursework ever complete a degree (Bowen, Chingos, & McPherson 2009). The students' success or failure in a gateway course can often be determined, not by their ability, but by their mindset. It is in universities' best interest to utilize these strategies to help students change their fixed mindsets into growth mindsets. This is more likely to lead to proactive learning and student academic success, which will increase overall student retention, and ultimately, improve student satisfaction and student graduation rates (Brougham & Kashubeck-West, 2017).

Many universities have implemented growth mindset strategies in basic mathematics courses; these have proven to be beneficial strategies, especially in developmental and introductory math courses (Edwards & Beattie, 2016; Yeager & Dweck, 2012; Zimmerman, Moylan, Hudesman, White, & Flugman, 2011). There is little research, however, on how these same strategies can be implemented in gateway writing courses. Because every student, regardless of degree plan, must take composition courses, using growth mindset can be

potentially instrumental in increasing student retention and encouraging student academic growth. This impact evaluation study, which was conducted over the course of a 16-week semester, targeted 150 Composition I students, in nine separate courses, at a regional university located in the Midwest. Central to the study were the use of 10 growth mindset strategies that were introduced weekly in the course during the duration of the semester. A control group of 69 students, who were not exposed to growth mindset strategies, was established at the beginning of the study; all composition students in the study were given a survey measuring growth mindset, a writing survey, and a course content assessment that were administered at both the beginning and at the end of the course.

The purpose of this research was to ascertain whether growth mindset could be used to increase student success in a university gateway writing course. This was determined by analyzing the results of the growth mindset survey, the writing survey, and the specific content area exit assessment. Several growth mindset strategies were used in this impact study, including having discussions about brain neuroscience and plasticity and what it means to have a fixed versus a growth mindset. The students also discussed the importance of practice and determination, taking academic risks, embracing setbacks, and learning through challenges. After each discussion, students journaled about these growth mindset topics and had the opportunity to discuss their thoughts with their small group. Research has shown that when students develop a fixed mindset, they often believe that seeking help is viewed as a weakness (Midgley & Urdan, 2001). This belief can become ingrained during the educational journey. For this reason, is was necessary for students to receive process-oriented feedback during the semester and attend conferences that created opportunities that allowed them to ask for help and clarification on assignments.

It is believed that these strategies led students to change their perception of their own intelligence, thus enabling them to develop autonomy. It is important for faculty members to support students in developing their own autonomy because students with autonomy are more likely to become motivated and confident learners (Deci, Vallerand, Pelletier & Ryan, 1991; Ryan & Deci, 2014). A growth mindset intervention study by Chao, Visaria, Dehejia, and Mukhopadhyay, (2017) indicated that growth mindset is only effective when students can develop or increase their autonomy. Once students have autonomy, growth mindset strategies encourage students to understand the importance of continued learning and to have a sense of community and greater campus connectivity. It is further believed that a growth mindset intervention will improve university retention rates because students will be more likely to enjoy mastering Composition I content, which provides an increased opportunity to persist in their academic success.

Several research questions frame this study:

RQ1: Do students surveyed in the treatment group have improved growth mindset in the areas of intelligence and talent?

RQ2: Do students who are exposed to a growth mindset treatment enjoy writing more than the control group?

RQ3: Are the exit assessment scores of growth mindset treatment students higher than those of control students?

RQ4: Do student demographics moderate the relationship between the growth mindset treatment and the outcome variables?

Retention is a complex and important undertaking. With that fact in mind, the goal of this study was to enhance student self-efficacy, which is accomplished by using growth mindset

strategies in a gateway writing course. This type of growth mindset intervention was designed to help students enjoy the writing process and improve their content knowledge, which ultimately led to greater confidence in the subject matter. Such improvements should ensure improved student academic success and higher retention rates. In prior research, these improvements proved to be particularly impactful for students of color, first generation students, and students from a low socioeconomic background.

Chapter 2: Review of Literature

The changing education marketplace, the defunding of higher education, and the increase in underprepared students has created a need for the use of retention strategies. Before implementing a retention program, it is important to understand the historical movement towards retention. Student retention has been researched intensely at many higher education institutions for almost 50 years. In the United States, the earliest higher education retention research began in the 1930s. This research was concerned with "student mortality," which studied the reasons why students were not graduating (Berger & Lyon, 2005). Mansfield, O'Leary and Webb (2011) note that a renewed interest in retention began in the early 1970s. Even though there has been research studying the various factors that impact retention rates since the 1970s, universities across the nation have begun to earnestly increase student retention efforts by earmarking school resources and implementing programs that they believed would provide improved retention results, leading to higher enrollment numbers and increasing the number of university graduates.

When examining the history of higher education, the continued downward trend in graduation rates and college enrollment, and the financial incentives tied to student success, it is not surprising that universities are moving toward a student retention model that will create positive outcomes for universities and students alike. In the past, many universities realized that their students felt disenfranchised, but the student retention effort really began in the 1970s with seminal works by Spady and Tinto, who developed student retention models (Pascarella & Terenzini, 1979a). Spady (1970) noted that student retention occurs when students develop an academic and social integration that leads to a commitment towards their own personal goals and towards the institution. Despite the student's family background, past education, and personal attributes, commitment level plays a key role in both academic achievement and forming social connections. Spady's (1970) research indicates that many students leave college as a result of

social pressure rather than simply academic difficulties. When students do not form institutional connections, there is a lower rate of persistence.

The student retention models, developed by Spady (1970) and Tinto (1975), both indicate that family background is a key factor in determining whether a student can integrate successfully into college life. Tinto's (1975) Student Integration Model, also focuses on "individual attributes" as factors that can potentially affect student success. These attributes are indicative of traits that students possess; Tinto (1975, 1987) asserted that a large part of academic success is how well a student navigates their social environment. When students are academically successful and have socially integrated with peers, they have a much greater likelihood of feeling connected with the university and completing a degree. Social integration increases the likelihood of increased academic performance (Cohen & Garcia, 2008; Mertes, 2015).

Even though student retention research escalated in the 1970s, there has been a renewed focus on student retention since 2008; retention has undoubtedly become one of the most researched and studied areas of higher education (Berger & Lyon, 2005; Tinto, 2007). Universities began to implement programs they hoped would provide cost effective ways to retain students, so accordingly, there has been a significant increase in research on retention efforts and finding ways to promote learning. It is a complex process to decide how to address student retention issues and to understand the dynamics of why students have retention issues. Much of the retention literature has suggested that institutions are responsible for implementing campus wide programming to improve retention efforts (Kadar, 2001; Keels, 2004; Lehr, 2004; Salinitri, 2005; Thayer, 2000; Tinto, 2000; Walters, 2004; White, 2005). Retention is certainly critical for university enrollment numbers, but in order to retain students, it is necessary to

understand the needs of students who are entering college life with very little preparation or a lack of motivation, which is often an indicator or predictor of student success (Caraway, Tucker, Reinke, & Hall, 2003; Dweck, 1986; Elliot, 1999; Kerby, 2015; Schunk, 1989).

Many times, students are underprepared due to socioeconomic status. Research has shown that student from a lower socioeconomic background are more likely to drop out of college and never finish a degree (Stinebrickner & Stinebrickner, 2003). Literature by Brooks-Gunn and Duncan (1997), Evans and Schamberg (2009), and Thompson (2014) have found that socioeconomic status is a predictor of academic success; students with a lower socioeconomic background may also have "reduced access to educational resources, higher levels of stress, poorer nutrition, and reduced access to healthcare" (Claro et al., 2016, p. 8664). These are all contributing factors that will determine if a student will ultimately have acquired the resources to be successful in a university environment. Because college enrollment numbers have decreased across the nation, many universities have tried to increase enrollment numbers by implementing lower admission standards, and as a result, institutions have admitted more students who are both academically and emotionally underprepared. This student population lacks the identifiable skills that are needed for basic college readiness. This lack of preparation has created the need for more focused student retention efforts.

Current University Retention Efforts

Current retention literature has emphasized institutional responsibility that is shared across all departments and that encompasses multiple retention programs or strategies (Kadar, 2001; Keels, 2004; Lehr, 2004; Salinitri, 2005; Thayer, 2000; Tinto, 2000; Walters, 2004; White, 2005). One strategy that universities began using as part of a comprehensive approach are Predictive Risk Models, or PRMs. Because there is a growing population of students who lack

basic college readiness, PRMs have been developed to understand the factors that put students at-risk and to understand why students lack the tools necessary to succeed in a college environment (Pengfei & Maloney, 2015). In fact, the past few decades have been pivotal in the developmental of retention efforts on most college campuses. Colleges are increasingly providing resources including writing centers, remedial and developmental curricula, academic and student support resource centers, and other types of outreach and engagement programs and activities (Coley, Coley, & Lynch-Holmes, 2016). These types of services and programs are greatly needed because more than two million U.S. college students take developmental courses annually (Saxon, Sullivan, Boylan, & Forrest, 2005). As a result, these resources are being implemented on college campuses across the nation. University administrators are realizing that their potential for recruiting incoming freshmen, a figure that had previously grown year after year, is now dwindling. As a result, university officials have surmised that it is much easier to keep the students that they have than to recruit additional students, especially when considering the declining number of applicants.

University officials are very aware that retention efforts are critically important; it is clear that the amount of money spent on academic support services directly predicts first year retention rates and 6-year graduation rates (Gansemer-Topf, & Schuh, 2006). In fact, research shows that financial expenditures "explained 60% of the variance in retention and graduation rates" (Gansemer-Topf, & Schuh, 2006, p. 626). It is important for university officials to spend retention allocations wisely, especially when many university retention efforts are based on known findings about at-risk students.

The need for comprehensive retention efforts has been examined by universities and education researchers. The University of Iowa (2008) coordinated with several other institutions

of higher education to study retention strategies. The final report from that collaborative work indicated that:

> Most decisions to drop out occur early in a student's interaction with an institution, many dropout-prone students do not voluntarily seek out institutional support services to assist them with problems that may ultimately lead to attrition behavior, it is easier to anticipate a problem than to solve it, faculty and staff are the best referral agents, many student problems are treatable if identified early, time and resources should be focused on the most dropout-prone students, and most students respond positively to direct contact in which potential or actual problems are identified and a resource of help is offered (p. 25).

Tinto's Student Integration Model was the first to show that students are more likely to graduate if they become socially integrated within their respective institution. As a result, many universities have implemented recommendations based on this research by creating pre-semester orientation camps and faculty mentoring programs, given that universities and community colleges have higher retention rates when faculty members build bonds and have interactions with students outside of the classroom environment (Derby & Smith, 2004; Endo & Harpel, 1982; Levitz, 1990; Maggio, White, Molstand & Kher, 2005; Pascarella & Terenzini, 1983). Many faculty members are also aware that these types of mentored relationships can increase student resilience and academic success (Brooks & Goldstein, 2008). This research has necessitated that universities understand the social dynamics connected to retention. Students come from diverse backgrounds and have differing academic abilities, so it is necessary to establish a system that will offer students the chance to improve their academic skills as well as the opportunity to establish social connections on campus.

Orientation Courses

Many universities have found that students are better able to acclimate to university life when they complete a mandatory orientation course. These types of courses teach students about time management skills, organization skills, and college readiness. The orientation course prepares students for the academic demands and social interactions they are likely to experience in a college environment. Derby (2007) notes that students are 30% more likely to persist and complete a degree if they attend an orientation course. African American students specifically are 70% more likely to complete college if they attend a university orientation program, but unfortunately as Derby and Watson (2006) discovered, many universities and community colleges have not fully understood the importance of orientation programs for students of color. Also, college students, particularly those taking developmental courses, have a greater chance of persistence when they are offered resources prior to beginning their first year of college (Hawley & Harris, 2005), and students who take a first-year seminar or study skills course tend to have greater academic success (Hyers & Joslin, 1998; Potts & Schultz, 2008; Raymond & Napoli, 1998; Starke, Harth & Sirianni, 2001; Windham, Rehfuss, Williams, Pugh & Tincher-Ladner, 2014). Thus, extant research clearly indicates the importance of orientation programs for assimilating underprepared students into higher education environments.

University Boot Camp

Another popular retention tool is a student focused boot camp, which offers students the opportunity to participate in group discussions, especially group discussions with diverse viewpoints. This type of immersion experience can help students integrate into the college environment in a deeper, more complex way (Antonio, Chang, Hakuta, Kenny, Levin, & Milem, 2004). Oftentimes universities offer a boot camp or family day to try to connect students to the

campus. A family day, where family members and friends are invited to campus and asked to participate in university activities, can help a student acclimate to university life and also receive information about the support systems that are offered on the campus (Ortiz, 2004; Torres, 2003). In addition, many universities offer extracurricular activities to help students form a connection with the institution (MacKay, 1991). According to retention research, if a student forms a connection with the institution, they are more likely to persist. The key to success is identifying and addressing student needs and concerns; however, many students are not required to take an orientation course or to attend a boot camp experience, which makes it virtually impossible to implement widespread retention strategies.

Faculty Mentoring

Another retention effort on university campuses is the implementation of faculty mentoring programs which are crucial in fostering relationships between students and faculty members. Such programs involve student-faculty interaction outside of the classroom which facilitates the development of leadership skills, positive self-esteem, and overall personal growth (Astin, 1993a; Astin, 1993b; Pascarella & Terenzini, 1979b). Students also feel more connected to the university and have overall greater satisfaction in their course of study when they can build a relationship with their professors. When a student has a positive interaction with a faculty member, especially an interaction outside of class time, generally the student is more satisfied with the college environment and with the quality of their personal relationships (Kuh, Kinzie, Buckley, Bridges, & Hayek, 2006). Not only is there positive personal growth, but research shows that this type of student satisfaction greatly increases when students are able to form relationships with faculty, staff, peers, and mentors, and these relationships contribute to overall student persistence (Astin, 1977, Astin, 1993b; Kuh, Kinzie, Schuh, & Whitt, 2005b; Kuh, 2005;

Pascarella & Terenzini, 1991, 2005; Tinto, 1975, 1987, 1993, 1999). Research also shows that positive student-faculty contact outside the classroom can improve retention efforts, and these types of positive experiences can have a statistically significant influence on the career that a student chooses (Astin, 1977, 1993b; Karman, 1973; Komarovsky, 1985; Levine & Cureton, 1998; Pascarella & Terenzini, 1977, 1991; Wood & Wilson, 1972). Several universities have also created faculty led learning communities; these communities have created a valuable network that has helped increase student persistence (Tinto, Russo, & Kadel, 1994).

Early Alert Systems

Most universities use early alert systems to identify at-risk students. Retention research shows that contacting students is incredibly beneficial. Rudman and Irvine Valley College (1992) discovered during a pilot study conducted at the college that "full-time students receiving alert letters had the highest end-of-year retention (81.3%), while part-time students in both the advisor and letter groups had greater end-of-year retention than those not contacted" (p. 1). Students have a greater chance of success when contacted by multiple university personnel; research shows that students are more academically successful when they are mentored by faculty and staff members. Empirical literature also shows that when an early alert system is used effectively, the benefits can be dramatic. One study that used an early alert system for developmental courses found a 17% decrease in D and F grades and an increase of 14% in A, B, and C grades (Budig, Koenig, & Weaver, 1991). At the University of Wisconsin–Oshkosh, early alert forms are used to provide an in-depth intervention where students are contacted for academic counseling and provided with peer tutoring. These types of early intervention programs have been proven to be beneficial at every student level and have helped retain up to 70% of the

at-risk student population (Bowman-Perott, Davis, Vannest, Williams, Greenwood, & Parker, 2013; Green, 1989; Jayaprakash, Moody, Lauría, Regan, & Baron, 2014).

Several universities have found success with adopting more systematic early alert systems; specifically, they and have found a guided team approach to be most effective (Geltner, 2001). The University of Missouri uses their Learning Management System, MU Connect, to help faculty members connect and identify at-risk students. The system uses a tracking program that allows access to current student information so that university personnel can provide immediate assistance to the student (Associated Press, 2014). This program is successful because it uses a systematic process that allows multiple faculty and staff members to be involved in addressing student needs.

Tampke (2013) indicates that early alert systems help universities to quickly identify at-risk students and to offer needed services. However, it is evident that many early alert systems are underutilized or that a systematic approach to help struggling students has not been effectively implemented. At-risk early alert student retention efforts include "identification, monitoring/tracking, and intervention system designed to identify, in advance of enrollment, high-risk or dropout-prone students who could benefit from institutional intervention and to identify enrolled students experiencing academic and/or personal problems that might be ameliorated by institutional intervention" (University of Iowa, 2008, p. 25). The intent of the early alert system is to rapidly assist students and to help those students with needed resources and emotional and academic support. An effective early alert system promotes student success by identifying the helpful resources in a timely manner, and it also implements a system that tracks and monitors students who are prone to dropping out of their courses (University of Iowa, 2008). Universities use these types of early alert systems to identify students who are at risk

before the student is in academic trouble. The early alert system is only truly effective if it is used for immediate intervention, tutoring, and mentoring, and many universities have found that using several types of intervention strategies is the most effective way to retain students (Bai & Pan 2009; Reinheimer & McKenzie, 2011).

Academic Tutoring

Identifying at risk students is critical, but it is even more important for university administrators to design adequate academic support services for students who are disengaged, underprepared, or struggling academically (Tight, 2019). For this reason, many universities have started examining indicators that determine student success and designing retention strategies based on those known indicators (Davidson, 2015; Fike & Fike, 2008; Mertes & Hoover, 2014). One of the more popular retention efforts being used at higher education institutions is academic tutoring. According to Amenkienan and Kogan (2004), students at every academic level benefit from academic tutoring and other support services. Tutoring is especially important in helping at-risk students complete their courses and graduate (Hodges, 2001). The retention issues and severe budget cuts in higher education have made student tutoring and academic resources even more valuable (Santee & Gakavalia, 2006). For this reason, universities have realized that increasing retention rates must include academic counseling and tutoring services.

At the University of Wisconsin–Oshkosh, professors identify at-risk students through the early alert system, but the key to student retention is the service referrals that occur after the university is alerted. Personnel immediately meet with students to provide academic counseling and to recommend peer tutoring programs. Higgins (2004) found that peer tutoring has helped increase the overall retention rate for students at risk of failing their courses. Grillo and Leist (2013) also hypothesize that students have a greater likelihood of persisting to graduation, and

they will have a higher GPA when they use the academic support services offered on campus. Hetzel, Laskey, Hardt-Schultz, (2014) report that tutoring sessions can have a dramatic impact on student retention. Most students are successful in their coursework when a tutoring session is attended for as little as a 30-minute block of time. Further research suggests that academic support services are beneficial for course completion, but tutoring and other types of academic support or remediation appear to be especially helpful for first generation, non-traditional, or transferring community college students (Byrd & MacDonald, 2005; Clark, 2012; Mitchell & Fry, 2016). Finally, universities have invested in tutoring and academic support systems because the current student population expects to have tutoring services provided by experts in specific subject areas (Peck, Chivers, & Lincoln, 2010). It is evident from research that academic support services must be offered to students who may not be adequately prepared for the rigor of college level work (Tinto, 1999). Rheinheimer and Mann (2000) purport that academic support services are essential to help students who are considered at-risk or underprepared to become on-level, and in some instances, these at-risk students even outperform students who were initially better prepared.

The problem with many retention efforts is that universities put measures in place without any plan to evaluate or change the programs when necessary. Many times, retention efforts become a bandage for the systemic problem of students not being mentally or academically prepared for the university environment. Some universities have extended retention efforts for gateway courses, but the institutions need to examine their student demographics to truly address the academic and emotional needs that will help to improve overall student success. According to the Center for Community College Student Engagement, (2019), another, possibly

more effective, way that universities can increase retention rates is by helping students to foster a growth mindset.

Fostering a Growth Mindset

Carol Dweck, who has written extensively on growth mindset strategies, has found that when students believe that their intellect or academic abilities are "fixed," they may subsequently have a lack of motivation. Conversely, when students develop a growth mindset, they believe that intelligence is fluid and changing; such a mindset can help students to triumph during challenges and exert more effort during their learning process (Dweck, 2006, 2007, 2008a, 2010b). There are several strategies that universities use to foster growth mindset including but not limited to creating cohorts or learning communities that help students feel connected to the campus community. Many universities have found that carefully planned group work can also help students to bond and feel connected to their classmates and to the course. In addition, professors are encouraged to learn their students' names and to spend time mentoring and meeting with students outside of the classroom. For retention purposes, school administrators and educators are encouraged to create a campus culture where students feel accepted and where they can begin to change from a fixed mindset to a growth mindset (Dweck, 2006).

Chapter 3: Theoretical Framework

The concept of growth mindset focuses on how students handle academic challenges and personal adversity. This concept categorizes students as having either a *growth mindset*, a mindset in which the student believes that their intelligence can "grow," or a *fixed mindset*, meaning that the student feels their intellect is pre-determined, and they cannot continue to improve academically. Dweck, a professor at Stanford University, has written broadly about psychological mindset, and the genesis of her research started while examining theories of intelligence (Dweck, 1999). Dweck asserts that "Individuals with a fixed mindset believe that their intelligence is simply an inborn trait - they have a certain amount and that's that. In contrast, individuals with a growth mindset believe that they can develop their intelligence over time" (2010a, p. 16). A mixed mindset is a mix of both fixed and growth mindset viewpoints. Research findings indicate that a fixed view of intelligence is a culturally-shaped belief; American students are much more likely to have developed a fixed mindset as a result of assumptions ingrained in American culture (Rattan, Savani, Naidu & Dweck, 2012).

Carol Dweck and her colleagues have linked the idea that a mindset construct is influential on a student's motivation and eagerness to learn and improve (Aronson, Fried, & Good, 2002; Dweck, Mangels, & Good, 2006; Good, Aronson, & Irzlicht, 2003; Svinicki, 2016). Dweck writes that "individuals may believe that ability and intelligence are fixed and not subject to change even with effort. Or they may believe that ability and intelligence are malleable and can grow with experience and effort" (2010a, p. 1). Additionally, Vandewalle (2012) found, that when a person has a fixed mindset, it is difficult for that person to change this assumption. If students have a fixed, negative view about their academic ability or intelligence, those assumptions can be a major impediment in their educational journey (Mangels, Butterfield,

Lamb, Good, & Dweck, 2006). Recent research has shown that a person's mindset is linked to their academic performance, engagement in tasks, and willingness to work through challenges (Vedder-Weiss & Fortus, 2013). As a result of this view on intellect and academic performance, a fixed mindset can make it difficult for universities to retain and graduate students.

Impact of Growth Mindset on Low Socioeconomic Students

The changing marketplace has created an uncertain future for higher education institutions. The survival and viability of the university system is dependent upon student retention and student academic success. Thus, research on developing a growth mindset, especially for first generation and lower income students, is essential for increasing academic success. Higher education institutions have studied and implemented student retention methods since the 1970s. Additionally, as a result of Carol Dweck's (2006) research, higher education institutions have embraced growth mindset strategies because they have been inundated with under-prepared students and students who do not meet basic admission requirements. In fact, Aronson, and Harder (2008) have determined that mindset is a contributing factor in minority students' lower standardized test scores, which helps to account for the growing number of students who enter college with inadequate test admission scores. Growth mindset impacts not only how a student perceives their own intellect and capacity to learn, but it also allows those students to learn and flourish by encountering and processing failures. Students with a fixed mindset only see failure as a limitation and a further confirmation that they are "not a good student" (Blackwell, Trzesniewski, & Dweck, 2007; Dweck, 2006). The growth mindset psychology reinforces that intelligence is not something that is fixed, and that by working hard, a student can increase achievement level.

Using growth mindset can possibly be even more beneficial when trying to improve the retention rate of low socioeconomic status students. This is an important premise because it is evident that socioeconomic status can predict academic success; students with a low socioeconomic background often have fewer educational resources, fewer healthcare options, poorer nutrition, and increased stress levels (Brooks-Gunn & Duncan, 1997; Claro et al., 2016; Evans & Schamberg, 2009; Thompson, 2014). Multiple studies have demonstrated the impact socioeconomic status has on academic performance. Based on those findings, Claro et al. (2016) hypothesize that having a growth mindset can help students better overcome the detrimental effects of poverty, and they theorize that mindset is a better predictor of success than socioeconomic status.

Researchers clearly understand the connection between academic achievement and socioeconomic status; growth mindset offers a possible solution that is beneficial to lower income students. Researchers question if economically disadvantaged students have a fixed mindset due to their socioeconomic status and whether that fixed mindset is more difficult to overcome because of those disadvantages. The correlation between a fixed mindset and socioeconomic status is problematic because low socioeconomic students are at a disadvantage academically, and having a fixed mindset makes obtaining academic success even more challenging. Because of this correlation, education researchers continue to explore how having a growth mindset can be psychologically significant and can negate the negative effects for low socioeconomic students.

Even though researchers have made the connection between academic achievement and socioeconomic status in multiple past studies, research by Claro and colleagues (2016) is important because it offers a possible solution that is beneficial to lower income students. A

study of low-income Chilean students, indicated that they were twice as likely to have a fixed mindset as compared to students who were identified as non-low income (Claro et al., 2016). The findings of this study are important for educators and policymakers, especially as education systems begin to focus more on social justice and equitable educational opportunities. Even though Claro et al. (2016) acknowledge that developing a growth mindset is not an answer to income disparities, the "observation that mindset is a more important predictor of success for low-income students than for their high-income peers is novel" (p. 8667). Additional research suggests that growth mindset is especially impactful for students of color, first-generation students, and students who are underprepared (Aronson, 2002; Paunesku, Walton, Romero, Smith, Yeager, & Dweck, 2015; Yeager et al., 2016).

Using Growth Mindset to Increase Student Motivation and Confidence

Growth mindset strategies can be implemented to build a student's motivation; past research has shown that students can be taught to develop a growth mindset which can improve their overall academic performance (Blackwell et al., 2007; Murphy & Thomas 2008; Valentiner, Mounts, Durik, & Gier-Lonsway, 2011). Recent research has also found that growth mindset can help students to increase their intrinsic motivation (Rhew, Piro, Goolkasian & Cosentino, 2018); intrinsic motivation helps to determine an individual's behavior and self-determination. In fact, Self-determination Theory posits that intrinsic motivation occurs when a person develops the basic human needs of autonomy, competence, and relatedness. When these needs are developed, a person will then have a high level of intrinsic motivation (Ryan & Deci, 2008). Interestingly, the evidence shows that there are neurological similarities between growth mindset behaviors and the behaviors that are found when a person has intrinsic motivation, so the

theory that growth mindset increases intrinsic motivation is plausible, especially considering these neurological similarities.

Table 1

Neuroscientific Evidence of Growth Mindset and Intrinsic Motivation

Growth Mindset (Behavior)	Intrinsic Motivation (Behavior)
Enhanced Pe amplitude (awareness and attention)	Enhanced SPN (engagement and enjoyment)
DLPFC (error-monitoring and behavioral adaptation)	Medial and lateral frontal cortex (cognitive control)
Dorsal ACC (error-monitoring and behavioral adaptation)	ACC (error-monitoring and behavioral adaptation)
-	AIC (awareness, engagement)
Dorsal and ventral striatum (intrinsic value of an action)	Ventral striatum (intrinsic value of an action, reward processing)

Note. from Ng, B. (2018). The neuroscience of growth mindset and intrinsic motivation. Brain Science, 8(2): 20. Doi: 10.3390/brainsci8020020. Reprinted with permission from the Neurological Research on Learning, Reward and Decision Making, CC BY-NC-ND.

Growth mindset is akin to self-efficacy, which Albert Bandura (1997) defined as the belief "in one's capabilities to organize and execute the courses of action required to produce given attainments" (p. 3). Self-efficacy theorizes that one's perception of self is shaped by how a person thinks they compare to others and how they perceive the feedback that they receive from other people (Bandura, 1986; Mischel & Shoda, 1995; Sutherland, Smith, & McLean, 2004). This is significant because many students who have had negative experiences with writing or reading have decided that the tasks are impossible, so they question their own intellect, which can lead to a lack of academic motivation. Self-efficacy is the student's belief that they can produce results and do well academically, and it can be a strong predictor of student success

(Bandura, 1997; Lane & Lane, 2001; Pajares & Johnson, 1996; Pajares & Miller, 1994; Pintrich & De Groot, 1990; Richardson, Abraham & Bond, 2012; Schunk, 1982). Similarly, the concept of growth mindset focuses on the positive impact of perseverance and the student's continual effort to learn.

Many students, at a younger age, did not have the proper home life, educational training, or encouragement that is needed to have positive associations with learning. When faculty members are aware that many students truly fear failure, they can implement strategies to help students overcome their own academic insecurities (Cox, 2009b; Farrington et al., 2012). Bean and Eaton (2000) developed a psychological model of college student retention, and their student retention model demonstrates that when students believe that they are competent and confident, they will become more goal oriented and are then more likely to complete tasks. By developing academic self-efficacy, students can integrate into university life, and thus, have a greater chance of persistence. Another study by Woolsey and Walsh (2009) found that self-efficacy interventions improved college students' perceptions of having a "purpose in life," meaning that students took part in meaningful campus experiences. According to retention researchers, self-efficacy allows for deeper connections and integration, and this type of connectivity can help improve student retention and academic success.

Ultimately, students feel better prepared to learn when they have a feeling of competency. This type of competency encourages students to further increase their academic skills, which can lead to a mastery of the content. Such a positive environment can help a student feel more motivated. Self-efficacy and Self Determination Theory are central to the development of self-regulation and motivation. Research shows that growth mindset can provide a way to further increase a student's autonomous motivation. Additionally, researchers believe that the

concept of growth mindset provides an innovative, positive way of thinking that will increase students' learning capacity and increase college achievement (Bong, 2001; Chemers et al., 2001; Gore, 2006; Multon, Brown, & Lent, 1991; Zajacova, Lynch, & Espenshade, 2005).

Current University Growth Mindset Treatments and Strategies

Growth mindset is currently being used in some higher education retention practices. Cleveland State College used growth mindset strategies in their First Year Seminar course and found that students went from having a 35% growth mindset to a 55% growth mindset after completing the module (Center for Community College Student Engagement, 2019). Gateway courses, also known as general education courses, have traditionally been considered the "weeding out" courses, however, universities have had to rethink their stance on student retention. The newer trend is to use growth mindset strategies in general education courses, specifically math gateway courses, because these strategies have been found to increase student retention and persistence.

Dweck (1986) found that motivational patterns can determine how well females perform in mathematics courses, which has long been a retention concern at the university level. In a study that examined the achievement gap between male and female students in a college math course, Dar-Nimrod and Heine (2006) gave a difficult math test to female college students, but first, they divided the female students into two groups. The first group was told that males were genetically predisposed to do well on math exams (fixed mindset) while the second group was told that there were no gender differences that accounted for math ability (growth mindset). The fixed mindset group subsequently performed significantly lower than those in the growth mindset group. In another study, Good, Rattan, and Dweck (2007) asked females taking a university calculus course how their mindset influenced their overall feelings about math. The

findings showed that females who demonstrated a growth mindset had grades similar to those of their male classmates. Another study of students in higher education found that when students are able to change their mindset about their own intelligence, they are able to better deal with challenges and setbacks in an academic setting, which makes them more active learners and higher achievers (Dweck, Walton, & Cohen, 2014). These types of interventions find that growth mindset can help to improve mathematics achievement for all students, regardless of age or gender (Dweck, 2008b).

Prior research has examined the benefit and need for student retention. Various studies have used Dweck's work to demonstrate that developing a growth mindset is important because students with this type of mindset typically seek out more difficult learning tasks and make better grades than students with a fixed mindset (Mueller & Dweck, 1998; Romero, Master, Paunesku, Dweck, & Gross, 2014; Stipek & Gralinski, 1996). An effective student retention model will integrate all current university retention resources; implementing a program design that includes using growth mindset in gateway writing courses will impact more university students and will have a greater effect on student retention and academic success.

Growth Mindset Research Design

The literature on growth mindset indicates that institutions with low performing students should adopt policies and practices that increase their students' academic success (Kuh et al., 2005b). Higher education institutions must consider teaching growth mindset to address the needs of a diverse learning population. In fact, it is imperative to use the growth mindset concept because "in 1983 there were 10.8 million students enrolled in college" (US Department of Education 2016); by the spring of 2016 there were "18.3 million students enrolled in Title IV, degree-granting institutions" (National Student Clearinghouse Research Center, 2016).

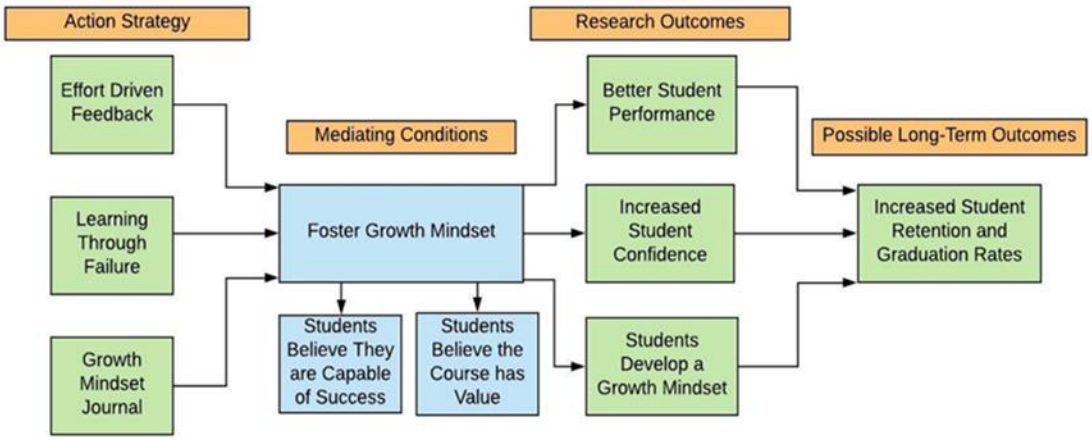
Enrollment rates, however, are now declining and degree completion rates have remained stagnant for the past 40 years (Bowen et al., 2009). According to ACT (2011), only about 60% of full-time students earn a 4-year degree within a 6-year time period, and only close to 30% of students seeking a 2-year degree at a community college finish within 3 years. It is also alarming that the completion rates are even lower for nontraditional students, students with a low socioeconomic status, and for students of color (ACT, 2011).

Due to this decline in college enrollment, the United States is projected to fall short of the needed 3 million college educated workers (Carnevale, Smith, & Strohl, 2010). Of the students who do enroll in college, much of the current population consists of students with weak academic performance and low socioeconomic status. The underprepared student population and the changing educational landscape have made it necessary for universities to rethink their retention practices, and thus it is imperative to begin using growth mindset in all gateway courses. Research clearly shows that growth mindset can influence students in math courses, including those in common education as well as higher education classroom settings. This research is unique because there has been little research published on how growth mindset affects performance in writing intensive courses—a general education requirement which is mandatory for every college student. With this in mind, the current study developed a theory of action (see Figure 1) that is conducive in facilitating the development of a growth mindset among Composition I college freshmen. One way to help students move towards a growth mindset is by introducing them to Dweck's (2006) growth mindset research which can help them understand the attributes of both a growth and a fixed mindset. The research design utilized in the current study followed four key strategies which included inspiring students to change their perception of their own intelligence, enabling students to develop self-efficacy and autonomy to

become more confident leaners, encouraging students to understand the importance of continued learning, and helping students have a sense of community and to feel connected to the campus.

Figure 1.

Theory of Action for the Growth Mindset Intervention



The long-term and short-term objectives, of better student performance and increased retention and graduation rates, can only be obtained through planned strategies that are used in a supportive environment. Once a supportive environment is established each semester, both at the university level and within the class dynamics of the classroom, students can be taught growth mindset strategies that will help them understand the importance of the course knowledge. Learning about brain neuroscience and a fixed mindset versus a growth mindset helped students understand that the brain continually learns new information and that intelligence is not a fixed state (Dweck, 1999, 2006). The students experienced process-oriented feedback, and they gained academic skills through content scaffolding. Students also discussed the benefits of practice and determination, taking academic risks and accepting challenges, and embracing setbacks and learning through failure. Journaling about each of these discussions provided students a chance to challenge their previously held views on these topics. It is believed that when students develop

a growth mindset, they are more likely to enjoy the writing process and better understand Composition I content. Additionally, development of a growth mindset is expected to help students increase their campus connectivity, improve student retention, and increase overall academic success. These strategies are used to help students develop a growth mindset. This will allow them to think of their learning experience in a new and more satisfying way.

In this impact evaluation, the strategies integrated into the university curriculum were used to develop growth mindset to improve students' writing and academic skills. The implemented strategies included providing effort-based feedback, teaching students to learn through failure, and having students use journaling to encourage personal and academic growth. The short-term objective of this treatment is to focus on changing the mindset of students and to show them that learning from challenges and failures can help them be more successful in their academic pursuits (Dweck et al., 2014). In the short term, it was necessary to have students develop a growth mindset and become actively engaged in their own learning because student engagement increases the opportunities for student success (McClenney, Marti, & Adkins, 2007).

The long-term goal was to increase student retention and graduation rates, which are beneficial outcomes for both universities and the student learners. Dweck (2010b) understands the necessity of creating a university culture that nourishes and develops growth mindset strategies. It is essential to have an environment where educators are given the support system to teach growth mindset concepts because research has shown that when universities allow instructors to implement strategies from the growth mindset concepts, students have a greater chance of success. Before suggesting the implementation of growth mindset strategies for this impact study, it was necessary to be cognizant of the difficulties that have been created by the

severe budget cuts on campus, and it was essential to understand the current retention efforts that are offered on the campus.

Midwest University

This growth mindset impact study was conducted at a small regional university located in the Midwest, which will be referred to as Midwest University. Midwest University is located in a state that has experienced devastating cuts to the higher education budget. The total amount of state allocated funds for 2009-2010 were $15,648,616, yet the state allocated funds for the 2016-2017, 2017-2018, and 2018-2019 academic year were, lower, specifically $11,540,652; $10,920,123; and $11,131,247, respectively. This is generally a 26% reduction in state allocations over approximately eight years. In addition to no longer receiving state funding, the university has not received the offset funding that is granted to higher education institutions to help "offset" the cost of building new facilities and purchasing upgraded equipment. The institution received $358,706 in the 2017 fiscal year, $332,793 in FY2018, and $330,792 in FY19. When compared with the normal offset fund allocations that should be $500,000 per year, it is estimated that since 2003, the university has not received in excess of $809,529 in offset funds in total. The President of Midwest University said that the "cuts exceed what we really thought would happen from the reduction of state support. We are now wrestling with that from a budget standpoint of how we will make all of that work."

The severe financial cuts have created the need to place employees on an extended furlough. University administrators realize that the decrease in allocations has made it necessary to enroll more students to make up the deficit. In addition, many state-funded programs for high school concurrent classes and the National Guard program are no longer fully funded by the state. The implementation of these programs is state mandated, but the state has not been fully

reimbursing Midwest University for its expenditures. When adding in decreasing enrollment, due partly to the unavoidable increase in tuition, the university's expensive loans on prior building costs during the Obama NorthStar era, and the rising cost of city expenses including but not limited to utilities, the storm water drainage tax, and building rental costs for graduation ceremonies, basketball games, and other events, the devastating financial impact is evident on campus. The university has had to make some very drastic decisions to stay operational, and thus there has been an increased focus on finding student retention methods that are cost efficient and effective.

Midwest University Student Services

Before suggesting the addition of using growth mindset strategies to improve student retention, it is important to understand the current services offered on the campus of Midwest University. The university has several policies in place to address student retention and academic success, but it is often difficult to assess when students are having academic difficulty. The campus, like most university campuses, has an early alert system in place, but this system is dependent on professors documenting concerns. There are so few academic advisors at Midwest University that many times the at-risk student is never contacted for enrollment or advising concerns. The former Coordinator of Disability Services and Student Affairs admits that it can be difficult to reach out to students who are struggling academically or emotionally because sometimes the students do not want to use the available resources. She states:

> If a student is new to the university, I encourage them to meet with me regularly throughout the semester. Some students take more advantage of this than others. I can't force a student to meet with me, so it's largely their responsibility to take advantage of the resources on campus. I attempt to track their progress but, many times, professors don't

> communicate with me if the student is struggling and, once I become aware of an issue, it's too late for me to intervene. There are so many students who struggle academically, and there are just not enough advisors to intervene quickly enough. Many times, it can take three to four weeks before a student is contacted to discuss an early alert warning, and oftentimes, it is too late for the student to salvage their grade in the course.

In 2016, the Midwest University campus administration decided to expand tutoring services to help accommodate students who might struggle academically or who need assistance for a course. One key aspect of the retention effort is the addition of tutoring services through Tutor.com. This computer application allows students to work with a qualified tutor, in a selected subject area, 24 hours a day and 7 days a week through an online system. The move towards online tutoring meets the needs of students who live off campus or who are seeking a distance learning degree from Midwest University. The university favors the move towards online degrees because it is then possible to enroll students from a multi-state area, thus increasing enrollment beyond the regional population.

There are also on-campus tutoring services such as the Writing Center. The Writing Center serves the needs of students who might struggle with writing or who need additional help structuring an essay. The Director of the Writing Center, believes that "students need time working with someone in person" and her trained tutors can "help with any discipline and any project." In addition to the Writing Center, the university has a Math Center and student tutors for the Spanish courses.

As the demographics change at Midwest University, due partly to heavy recruiting for the sports programs and the increase in Pell grant recipients, there is an awareness that many of the students lack the academic skills needed to be successful in college. Midwest University's

enrollment of student athletes creates issues for the university because athletes are a student population with lower retention rates (Mendoza, Horton, & Mendez, 2012). In addition, "only 21 percent of African American high school graduates, 33 percent of Hispanics, and 33 percent of students from families with annual incomes below $30,000 have college-level reading skills" (Kuh, Kinzie, Buckley, Bridges, & Hayek, 2007, citing the American College Testing Program 2006). These numbers are of great concern to universities because each student who enters underprepared has a much greater chance of leaving and never completing a degree; many students at Midwest University are not entering the institution with the necessary college skills. While Midwest University offers the aforementioned tutoring services, these services are optional for students. Students are often either unaware of the assistance or choose to not seek help because they feel defeated or embarrassed. It is the declining university enrollment, the severe state financial cuts, and the need for student retention that makes this growth mindset impact study especially relevant for higher education institutions like Midwest University.

Intervention

Dweck (2006) asserted that people can cultivate their abilities and that they can learn to do new things and accomplish new tasks if they believe that those things are attainable. It is with this thinking that many educational practitioners have implemented strategies to help students develop their own abilities; these are the same strategies that will be used and incorporated in this impact study. Research shows that practitioners should intentionally create a classroom environment that fosters growth mindset because this will increase overall academic performance (Farrington et al., 2012; Snipes, Fancsali & Stoker, 2012). Dweck (2006) recommends teaching students about brain neuroscience and the difference between a fixed versus a growth mindset. It is also essential to provide effort-based or process-oriented feedback.

When students recognize that they can learn through their failure and embrace setbacks, they will understand the important of practice and determination, taking risks and accepting challenges, and they are able to use journaling to build self-confidence and to understand the need to take risks during the learning process. Finally, students with a growth mindset will develop autonomy, they will have an increased level of self-efficacy and motivation, and they will build stronger campus relationships. These strategies will result in greater student satisfaction and increased academic success, which will lead to an increased level of student persistence.

Brain Neuroscience and a Fixed Versus Growth Mindset

In week two of Composition I, students in the treatment sections read an article about brain neuroplasticity. With advances in current brain research, scientists have long realized that the brain is pliable early in life, but the discovery in the last decade is that the brain also has plasticity throughout adulthood (Calderone, 2014; Doidge, 2007). This new context of understanding the brain is a central tenant in the growth mindset philosophy. The Brain/Neuroscience Discussion that takes place during this week is based on Dweck's acknowledgement that brain plasticity "has shown how connectivity between neurons can change with experience. With practice, neural networks grow new connections, strengthen existing ones, and build insulation that speeds transmission of impulses" (Mindsetworks, 2017). Learners were taught that their level of intellect is not "fixed" at any age or certain stage of development, and it was explained in detail that intellect and knowledge can continually grow and develop.

Research shows that teaching students about brain science is the first step in helping them understand that intelligence is not fixed. This concept creates an environment where the students realize that their academic ability can change based on practice and experience, and this

information ultimately leads to an outcome where students feel empowered to keep learning. The information on brain neuroplasticity is a way for students to realize that their brain can form new connections and meet challenges to learn (Dweck, 2006). After this lesson, students began to understand that their brains could make these new connections. The research on brain neuroplasticity allowed students to think about knowledge in a much more profound way, and this insight also gave students the opportunity to feel much more confident about their learning capability. After spending a short timeframe researching and reading more about brain plasticity, students were asked to journal about a time when they faced a challenging task and how they persevered to become successful in an academic area or a sport. After writing about brain plasticity, students shared their experiences in small groups. It was important for students to hear that their classmates have had similar experiences and that they have also faced obstacles and setbacks. The key message is that everyone has challenges, but it is how students approach the task that truly determines if they ultimately have success or failure (Dweck, 2006). It is a central belief in growth mindset that working to overcome obstacles can lead to an increased level of achievement (Ericsson, Charness, Feltovich, & Hoffman, 2006). The neuroplasticity scientific data leads to an epiphany for many students, and it is the first step in trying to change a student's fixed mindset, which is a mindset that has caused the student to believe that they are not capable of improving their knowledge base.

The Power of Yet

Learning about neuroplasticity and brain science provides the perfect opportunity to introduce the concept of growth mindset. Students were shown the Dweck "Power of Yet" video in week three, and they were led in a discussion about fixed versus growth mindset during week four. Students were introduced to the concept that intelligence can be developed and enhanced

over time (Sternberg, 2013). After viewing the "Power of Yet" video, students were asked to journal about a time when they felt, or were made to feel, that they could not be successful at a task. In addition, the students were then asked to write about how they viewed that experience after learning about growth mindset. After spending a short timeframe researching and reading more about brain plasticity, students were asked to journal about a time when they faced a challenging task and how they persevered to become successful in an academic area or a sport. Students shared their experiences in small groups. It was essential for students to hear that their classmates have had similar experiences and that they have also faced obstacles and setbacks, and when students begin to view setbacks and challenges in a new way, they are not automatically defeated by difficult tasks (Silva & White, 2013).

Many times, well intended educators can unknowingly cause students to have setbacks. By teaching growth mindset, students were provided with a way to use determination to discover their own talents. The key message was that everyone has challenges, discouragement, and setbacks, but it is how students approach the task that truly determines if they ultimately have success or failure (Dweck, 2006). It is a central belief in growth mindset that working to overcome obstacles can lead to an increased level of achievement (Ericsson et al., 2006). The fixed versus growth mindset discussion helps students to realize that their mindset plays an important role in how they perceive their own identity as learners.

Process Oriented Feedback and Scaffolding

Feedback can be a critical component in developing a growth mindset in students. Receiving negative feedback, or alternatively being complimented for one's intellect, can shut down students' educational growth (Cimpian, Arce, Markman, & Dweck, 2007; Kamins & Dweck, 1999; Mueller & Dweck, 1998). Students who are criticized often begin to internalize

the belief that they are unable to perform the tasks (Dweck 1999, 2006). Conversely, students who are praised for their intellect become fearful to perform difficult tasks that would make them appear less intelligent. Even worse, when students are continually praised, research shows that they will begin to hide mistakes they do make (Nussbaum & Dweck, 2007). In line with this thinking, Tinto (1987) notes that a cohesive learning environment is one that identifies student expectations and provides meaningful feedback to students. In fact, research has found that student achievement is greatly affected by the way teachers give feedback (Hattie, 2009). Students should be encouraged to continually make an effort to learn new knowledge because when students are praised for effort, they realize that they have the possibility to keep making improvements and achieve positive growth (O'Gara, Karp, and Hughes, 2008).

It is possible for professors to facilitate the development of students' growth mindset simply by changing the way they give feedback to their students. In Composition I, students were provided with very detailed feedback on their writing, and they were encouraged to revise their work multiple times. They were also told that "writing is a process that is never finished" because they need to realize that they should work to continually improve their writing. Corrections should be viewed as learning opportunities, and students should understand that learning, and their capacity for learning, is a fluid process (Dweck, 2006). It is believed by Dweck (2010a) that teachers and administrators need to teach students that their intellect is fluid and ever changing because when educators can actively teach students that intelligence is fluid, they are teaching learners that they have control of their own learning environment. The belief in learning fluidity is central to the way feedback is given because students must continually be encouraged to try new endeavors and keep building skill sets. Students with a growth mindset realize that even though they might not understand all of the criteria in a writing assignment,

there is power in knowing that they can learn that knowledge, and the feedback emphasizes that they just have not learned that specific skill "yet."

Students have previously been conditioned to view feedback, even constructive criticism, as a negative experience that reinforces their self-perception, and many times, underprepared students, especially students of color, perceive criticism as conformation that they do not belong in an academic setting (Mendoza-Denton, Purdie, Downey, Davis, & Pietrzak, 2002). Poor students see the grade and feedback as confirmation that they are not intelligent, and that they, essentially, are unable to learn new concepts or knowledge. In contrast, excellent students believe that the feedback defines who they are as learners; they can often be so worried about maintaining stellar grades, that they no longer take risks by engaging in challenging learning environments (Hong, Chiu, Dweck, Lin, & Wan, 1999; Mueller & Dweck, 1998). The feedback that encourages growth mindset is process oriented feedback that teaches students about perseverance, improvement, and the need to actively seek out challenges. This type of feedback can be very beneficial when working with students of color, especially when students have difficulty accepting critical feedback due to past negative educational experiences (Cohen, Steele, & Ross, 1999). Process oriented feedback differs from process praise feedback, which is focused on the talents and accomplishments of the student. Process praise feedback also differs from outcome praise feedback which primarily focuses on a final product or outcome (Cimpian et al., 2007; Kamins & Dweck, 1999; Mueller & Dweck, 1998).

For this growth mindset strategy, students were given a feedback sheet that included three items from their paper that were enjoyable and three areas from their paper where they could continue to improve. The goal of process-oriented feedback is to teach students that the most important part of the writing process is to learn from mistakes and to continually challenge

themselves during the writing process. The conversations about graded items always focused on areas for improvement and not on the student's intellect or ability. Process oriented feedback is incredibly important because students develop and maintain greater intrinsic motivation when they understand that learning goals are more important that performance goals (Grant-Halvorson, 2010; Grant & Dweck, 2003; Haimovitz, Wormington, & Corpus, 2011).

The Composition I course is also set up to scaffold, or build on content areas, so that students had a chance to master the needed content by the end of the semester. Scaffolding allowed the students to develop skills that build on one another, and this strategy helped students to not feel overwhelmed. Scaffolding provides students with the opportunity to build on their knowledge base; students are encouraged to develop their academic skills until they reach content mastery.

Learning Through Failure and Embracing Setbacks

For students to be successful in college, and specifically in a Composition I course, they cannot be afraid to make mistakes; they must learn to accept challenges and not be afraid of failure. A fixed mindset leads people to avoid challenges because they believe that any type of failure might showcase their deficiencies (Eccles & Wigfield, 2002; Hagel & Brown, 2010b). In addition, Dweck, Chiu, and Hong (1995) found that when people have a fixed mindset, they are not able to envision how to change their behavior; they simply view present situations and challenges as being the same as past experiences. In fact, many times when fixed mindset students are faced with a challenge, they make even less effort and will even consider cheating on assignments (Blackwell et al., 2007). In fact, students who admit to cheating in their college courses increased from 26 percent in 1963 to 52 percent in 1993 (Astin, 1993b). With growth mindset, students are given an alternative to cheating when they are taught to see their own

failure or setbacks as part of the observable learning process, and they are encouraged to take risks to become successful at the task.

Dweck (2006) believes that growth mindset encourages students to lean into fear, and to be successful; students cannot be afraid to fail because failure allows greater learning opportunities. A fixed mindset can be even more detrimental to students who believe that they already have an academic deficit (Aronson, 1999; Steele, 1997; Stephens, Hamedani, & Destin, 2014). Past interventions at other institutions focused on having struggling students identify outside factors that were not based on academic ability or intellect, so they could begin the process of changing their fixed mindset (Cohen, Steele, & Ross, 1999; Jamieson, Mendes, Blackstock, & Schmader, 2010; Ramirez & Beilock, 2011; Walton & Cohen, 2007, 2011). No matter the intervention process, it is necessary to find ways to change students' negative associations with learning.

In week six, Composition I students are led in a discussion about how they can learn from failures, and they are then asked to journal about a time when they failed at a task. The next part of the journal activity is to write about how they will use growth mindset when facing a future failure. The students build on this lesson in week seven when they discuss how to use fear as motivation. Often, students need to be taught that failure is a process that teaches essential lessons. The importance of failure is used specifically in the context of their writing pieces. Research shows that growth mindset-oriented students see failure as an exploration; they do not give up when an assignment is difficult, but instead see the difficulty as a way to challenge themselves.

In Composition courses at Midwest University, students are taught that red ink equals learning opportunities. Every student is required to actively edit papers, ask questions about their

writing, and visit the writing center, even if the student is a successful writer. Students are continually reminded that setbacks are a part of the learning process. A bad grade or a difficult assignment might be perceived as a setback, but students need to understand that they can work to overcome difficulties. A challenging situation does not define their intelligence. In fact, students are taught to see their own failure, specifically failures in the context of their writing pieces, as part of the learning process. Essentially, the growth mindset message is that everyone has more to learn, and students should actively embrace feedback and editing opportunities to achieve greater growth in the college writing process. By embracing failure, higher education students can explore multiple learning opportunities, and they, in turn, will be less fearful of taking risks (Dweck, 2006). Instead of seeing failure as a confirmation that they are poor performing students, they instead view their failures as a means to open the doors to future learning opportunities. By teaching the concept of growth mindset, students can begin to view the learning process as one that is feasible for all students, regardless of perceived intellect; it is a process that leads students to continually apply effort and move forward through failures, and this mindset is what will ultimately lead to student academic success.

Practice, Determination, Taking Risks and Accepting Challenges

While being exposed to the growth mindset treatment, students begin to recognize that practice, persistence, dedication, and hard work are essential for academic success, and even more importantly, these practices are something that students can control to assure their own success (Dollinger, Matyja, & Huber, 2008). When students are aware that they need to practice and have determination, they increase their ability to correct mistakes and to engage in new learning opportunities (Blackwell et al., 2007; Nussbaum & Dweck, 2007). Additionally, Dupeyrat and Mariné (2005) found in their research that Dweck's model can be especially

beneficial for non-traditional and returning adult students. Practice and determination were discussed in week 14 of Composition I, and students began to understand that practice is essential to success.

During week five of Composition I, students are led in a discussion about risk versus perfection. Students are encouraged to discuss the advantages of taking risks in their writing, and they also discuss why being perfect is not the goal in the class. This type of discussion allows students to embrace and learn from imperfection, and they also understand that struggling with a concept is a natural part of the learning process. Learning should be viewed as a challenge that is exciting. To begin the process of thinking about determination in a new way, students were given an assignment where they are asked to take a risk. The "risk" was clearly defined as being safe and legal, and the students were asked to complete the challenge before coming to the next class session. This risk could be anything that the student might choose, and oftentimes, students chose to challenge themselves on something related to their academic career. Other times, they found the courage to speak to a stranger or they decided to start a dreaded fitness journey. The goal of the assignment was for students to choose a task that would push them out of their comfort zone.

The students in Composition I were taught that taking a risk can be difficult, and that the risk will not always be rewarding or successful, but that it is impossible to grow and improve without taking risks and accepting the challenge to learn and grow as a student and individual. Hirsh and Killion (2009) acknowledge that adult learning is enhanced when students are in an environment where they feel empowered to experiment and take risks. When students learn to take risks and work through challenges, they ultimately develop self-efficacy, which is encouraged by setting clear goals and expectations and encouraging students to keep working

through challenging assignments. Using these types of discussions to build a growth mindset can lead to an increase in a student's enjoyment of the course subject matter and can result in better mastery and academic performance (Aronson et al., 2002).

Journal Writing and Developing Autonomy

Oftentimes students step into the classroom convinced that they are not very intelligent or that they are essentially not good writers. To begin to chip away at a negative, fixed mindset, students can use the active process of journaling. In this treatment, students were asked to journal during each class session for the duration of the 16-week course. Journaling is a way to have students challenge their fixed mindset and to understand the benefit of risk taking and overcoming challenges and setbacks. The journaling process reinforced the growth mindset discussion points and helped students to better understand the learning process.

Many educators believe that "reflective writing assignments, focused around process reflection - the intentional, structured or systematic analysis of processes and their outcomes, can contribute to gains in student retention and persistence because they help students develop growth mindset" (Korstange, 2016, p.1). Journaling has also helped students challenge their assumptions, and a past study found that a short writing exercise allowed students to examine their own personal values and beliefs, and this type of reflective writing was particularly useful in helping to close the academic gap for students of color (Cohen, Garcia, Apfel & Master, 2006; Cohen, Garcia, Purdie-Vaugns, Apfel, & Brzustoski, 2009). Professors can also use journal writing as a strategy to encourage goal setting, which researchers have found to be beneficial for increasing academic performance (Morisano, Hirsh, Peterson, Pihl, & Shore, 2010). Students are told that journaling is important because the writing process is a fluid process that is ever changing and never complete, which is indicative of the learning process. Students began to

think of their own learning in the context of the writing process: they would edit, they would revise, they would build on a knowledge base, and sometimes they would have to start completely over. Spending time in this process is never wasted, and is always beneficial, because students learn from each attempt at writing. The goal of these short journal assignments is to help students to understand and embrace the challenges and setbacks that are part of the college writing experience. Growth mindset essentially changes the way students think about their own writing, and it can make learning a much more positive, rewarding experience.

Korstange (2016) believes that reflective writing can help a college student begin to develop a growth mindset. To accomplish this, students were shown a variety of growth mindset focused articles and short media clips that allowed them the opportunity to write reflectively in their personal journals. They began the course by reading an article detailing the discoveries in neuroscience that prove that the brain is a muscle, and they are shown that they can "grow" their intellect and knowledge base, even as adult learners. The students also viewed a short video about famous scientists, athletes, and inventers who all persevered and triumphed through failure. Each class began with this type of short article or media clip (mostly from inspirational movies), and students wrote a response in their personal journal. After watching these videos, students began to understand that failure and determination are part of ultimately obtaining success. According to Dweck (2009), it is important for students to realize that they can develop their talents in any endeavor, "whether we are talking about sports, the sciences, the arts, or business, the people who are the great successes developed their abilities through dedication and labor, not simply as a natural by-product of their talent" (p. 69).

Journaling provides students the opportunity to use critical reflection. Critical reflection is described by Stein (2000) as a process where adults can examine their assumptions and can

decide if they need to act in an alternative manner. It is necessary for students to begin to connect with their own assumptions, and possibly change their own negative views on intellect and learning opportunities. Students are encouraged to determine how much they choose to learn, and to view their educational journey as a true quest for knowledge. Research has determined that a student's mindset on intelligence is often formed by their experiences and perspective (Haimovitz & Dweck, 2016; Mueller & Dweck, 1998; Sun, 2015), so journal writing essentially helped students to begin the process of examining their own mindset and their preconceived perspectives. This type of writing allowed students to push past old assumptions and begin to think about learning in a new and profound way.

In Composition I, the student treatment group was encouraged to have autonomy, both in their journal writing and in their paper topic selection. This growth mindset strategy was used daily in the course. In week 12, students were encouraged to choose their own research topic, which encouraged autonomy and positive learning growth. Autonomy is essential for authentic learning, and for that reason, students were encouraged to develop autonomy and to care about their own education. Part of this undertaking was accomplished by allowing students the freedom to find a topic that they found interesting and that they were excited to research. The goal was for students to enjoy the learning process, and by allowing them the freedom to explore topics, they felt encouraged and supported.

Building Faculty Relationships and Connectivity with HELP Conferences

Growth mindset can build relationships between professors and students and create campus connections. Faculty and peer mentoring are particularly useful when used as an intervention to help vulnerable students, and as a result, most universities have implemented a faculty or peer mentoring program on campus as part of their retention services (Terrion and

Leonard, 2007). Dweck (2006) believes that growth mindset allows students to feel that they are not being judged, but instead, the student can feel that they are being supported, and Tinto (1987) has found that it is necessary for institutions to create a caring atmosphere where students feel like they belong and where they are adequately supported. In addition, Maslow (1943) purports that a basic human need is for people to feel like they belong and that they have connectivity to a group. In fact, social connectivity, and the feeling of belonging, have been found to increase motivation and goal setting practices (Walton, Cohen, Cwir, & Spenser, 2012). For these reasons, most universities have implemented a faculty or peer mentoring program on campus as part of their retention services (Levitz, 1991; Sanchez, Bauer & Paronto, 2006; Terrion & Leonard, 2007).

There are a multitude of reasons that students do not graduate, but oftentimes there are emotional issues, family problems, and work demands. In the changing educational marketplace, it is necessary to educate the whole student and not just teach an academic subject area. A student's dysfunctional family life can many times cause retention issues because the student does not feel like they have a support system. As noted by Kowalski (2011), "…the family provides day-to-day interactions…[and] has direct influence on individual student learning" (p. 31). Students can struggle academically because they do not have a familial support. Students can also have difficulty navigating university life because approximately one in three students are first generation college students (National Survey of Student Engagement, 2019). On an annual basis, 45% of students who start college do not persist towards a degree. However, of these students, less than one quarter leave college as a result of their academic performance (Kuh et al., 2006). Studies also show that students who take more than four years to graduate, in a traditional degree plan, are more at-risk of not persisting (Astin, 1997).

When a student does not have anyone in their family who can help them navigate through the process of obtaining a degree, they are already at a disadvantage. Kuh et al. (2006) write that "most studies of first-generation students tend to attribute their lower levels of academic and social engagement and learning and intellectual development to the immutable characteristic of being born to parents who did not go to college" (p. 45). For first-generation college students and students who have non-supportive families, mentoring strategies, like growth mindset, can be a critical retention tool. Research also consistently shows that African American students, Hispanic students, and low-income students benefit greatly when developing relationships and feeling that they are supported by faculty members. This type of intervention helps students to not feel like they are being intellectually stereotyped, and positive relationship building can improve overall achievement (Aronson, Cohen, & McColskey, 2009). Faculty and peer mentoring are particularly useful when they are used to build connections. It is especially important to create connections that help support vulnerable students. Hurtado, Milem, Clayton-Pederson and Allen (1999) note that struggling and underprepared students, especially students of color, are often reluctant to ask for help or assistance unless they have formed connections with faculty or staff members on campus.

University administrators realize that they must create a strong campus support system that helps students build connections, and as a result, the focus on retaining students has created the need for effective faculty and peer mentoring programs. Student mentoring is very necessary because many times, academic failure is not the reason that students leave college; there are extenuating circumstances that can cause a student to withdraw from courses, and forming campus relationships can help a student seek the needed resources that will help them persist. For this reason, it is equally important for students to build relationships with their peers. This type

of growth mindset focused and collaborative classroom environment helps to build relationships based on trust. This type of support helps students feel much more comfortable working on new academic skills and addressing academically weak areas. By including growth mindset in gateway courses, faculty members can use feedback and encouragement to help build strong relationships and connections with their students. When a course uses these types of growth mindset strategies, students can build relationships with professors and peers and create strong campus connections, and it is these types of connections that will help students persist.

Many underprepared students are incredibly fearful when entering a gateway course. When professors teach students to think about the learning process in a new way, however, they can fully encourage and mentor their students. In line with this strategy, Composition I treatment students met individually with the professor for "HELP" conferences. These conferences occurred three times during the semester, and they provided a chance for students to ask questions. In fact, the student *had* to ask at least three questions during the conferences. The "HELP" conferences also offered an opportunity to provide process-oriented feedback, reinforce the growth mindset concepts, advise the students of resources on campus, and provide some one-on-one faculty mentoring. This new way of thinking and the increased level of confidence allowed students the opportunity to have long-term learning success, and for that reason, this impact evaluation continually provided students with encouragement and support via effort-based or process-oriented feedback, and these strategies enable students to feel more satisfied with their academic experience.

Student satisfaction is one area that has been closely studied in retention research. If a student can overcome financial, academic, and personal obstacles, they will often complete their education if they feel personally connected to their institution (Tinto, 1975, 1987). A growth

mindset treatment in a gateway course can help a student feel encouraged and supported. By teaching students to think about the learning process in a new way, professors can encourage and mentor students. This type of collaborative relationship builds trust in a classroom setting, and often, students will feel much more comfortable working on new academic skills and addressing academically weak areas. It is believed that students who are taught how to have a growth mindset during their academic career will become more successful. Many students do not have positive associations with learning, but when a student is taught how to develop a growth mindset, they can ultimately be more successful in a rigorous academic environment (Dweck, 1999, 2006). The research shows that a growth mindset can be taught, and this new way of thinking allows students the opportunity to have long-term learning success, and for that reason, this impact evaluation continually provided students with encouragement and support via effort-based or process-oriented feedback. Additionally, as discussed, the study used growth mindset discussions, journaling opportunities, and student conferences, all of which helped to build campus connectivity and increase academic success.

Chapter 4: Method

Restatement of Purpose

Universities are experiencing low enrollment numbers. Of the students who are enrolling, a growing number are academically underprepared. As a result, retention efforts have become increasingly important. There has been a focused effort by university administrators to implement effective retention strategies and tools to help underprepared students find academic success. Carol Dweck (2006) advocates that education professionals should use growth mindset, which is the notion that an individual's intellect and academic ability are not "fixed," but instead, ability is often determined by practice and determination. Blue and colleagues (2018) have found that students who are identified as having a low socioeconomic status, or who are first generation college students, tend to enter school with a fixed mindset. Those students are often underprepared academically. Many times, these types of barriers have decreased a student's motivation to learn (Eccles, 2005). Universities have had to focus on student retention; past growth mindset treatments have shown that when students develop a growth mindset, they also increase their academic potential (Romero et al., 2014; Yeager et al., 2016). Thus, students can develop a growth mindset and change their perception about the learning process, which enables them to persist and become academically successful.

The purpose of this research is to ascertain whether growth mindset can be used to increase student success in a university gateway writing course. This impact evaluation study, which was conducted over the course of a 16-week semester, targeted 150 Composition I students, in nine separate courses, at a regional university located in the Midwest. Before the impact study began, careful planning and studying of the empirical literature was used to develop a theoretical framework and to determine the growth mindset strategies that would be used in the treatment. One year prior to the treatment implementation, many of the selected growth mindset

strategies were used in several composition I courses at Midwest University to better understand how these strategies could be successfully integrated during the treatment and research phase of the study. The strategies that were deemed successful were replicated during the treatment.

Central to this impact study is the use of 10 growth mindset strategies that were introduced weekly in the course during the duration of the semester, including having discussions about brain neuroscience and plasticity and what it means to have a fixed versus a growth mindset. The students also discussed the importance of practice and determination, taking academic risks, embracing setbacks, and learning through challenges. Each of these discussion topics were introduced strategically to help students develop a growth mindset. A control group of 69 students, who were not exposed to growth mindset strategies, was established at the beginning of the study; all composition students in the study were given a survey measuring growth mindset, a writing survey, and a course content assessment that were administered at both the beginning and at the end of the course. The program effect was determined by analyzing the results of the growth mindset survey domains, which include intelligence, talent, and writing enjoyment. The content area entrance and exit assessments were also used to comparing the pre-test results as well as the post-test results of the treatment and control group students. The treatment group also used journaling and an exit survey as part of the growth mindset study, and this qualitative data was also collected and analyzed to determine if students had developed a growth mindset.

This impact study was guided by the following research questions and hypotheses:

1. Do students surveyed in the treatment group have improved growth mindset in the areas of intelligence and talent?

H1: Students who are surveyed in the treatment group will have improved growth mindset in the areas of intelligence and talent.

2. Do students who are exposed to a growth mindset treatment enjoy writing more than the control group?

   H2: Students who are exposed to a growth mindset treatment during their Composition I gateway course will enjoy the writing and learning process more than students who are in the control group.

3. Are the exit assessment scores of growth mindset treatment students higher than those of the control students?

   H3: Students who are exposed to growth mindset strategies in their Composition I gateway course will be more successful in their exit assessment improvement of measurable content knowledge than will the students who are in the control group.

4. Do student demographics moderate the relationship between the growth mindset treatment and the outcome variables?

   H4: Growth mindset strategies, used in a gateway course, have a greater positive impact on the intelligence, talent, and writing domains for first generation students, lower socioeconomic status students, and/or students of color.

Data Sources and Collection Procedures

The data for the growth mindset treatment empirical test came from the Composition I treatment and control student population at Midwest University, a regional university located in the Midwest of the United States that has a high proportion of first-generation college students (see Table 2). Typically, approximately 84% of the student population at Midwest University

receives financial aid, which is indicative of students who tend to have a lower socioeconomic status.

Table 2

Student Demographic Institutional Fact book, 2017

Reported Ethnicity	**Percent**
White Non-Hispanic	66%
Native American or Alaska Native	24%
Reported Ages	**Percent**
Ages 18-20	34%
Ages 25-29	24%
Language Spoken	**Percent**
Native English speakers	98%
Enrollment Hours	**Percent**
Enrolled in 12 or more credit hours	66%
Average Grade	**Percent**
Overall "B" grade average	50%
Parental Education	**Percent**
Neither parent holds a college degree	54%

The current student population, from which the sample was drawn, is typically comprised of 61% female students, 39% male students, 2,930 students that are ages 18-25, 1,144 students that are over the age of 25, and 343 students reported primarily as concurrent high school students ("Midwest" University, 2017). Students were assigned to the treatment group and control group based on their enrollment in an on-ground composition course for the treatment study semester.

The Midwest University students in the treatment and control groups had similar student profiles in regard to first generation status and ethnic identification, as the institutional Midwest

University data. The treatment and control students reported as 46% of the population as having low socioeconomic status, and 64% of the students identified as first-generation students, whereas neither their mother or father had obtained a college degree. The student population for the control and treatment group reported as 46% non-white, or students of color, and it is noted that Midwest University has a high population of Native American students, which is typical for this region of the state. Lastly, the treatment and control students reported their ACT composite score; 66% of the students had a 19 or below on the exam (see Table 3). The standard admission requirement for Midwest University is a 19, whereas the standard admission requirements for most universities in the state is 21. The lower admission scores, and the percentage of students scoring below the admission requirement, are indicative of the student population; this population typically enters Midwest University underprepared academically.

Table 3

Treatment and Control Student Demographics

Reported Ethnicity	**Percent**
White	43%
Native American or Alaska Native	33%
Non-White	13%
Reported Ages	**Percent**
Ages 18-20	91%
Ages 25-29	4%
Household Income	**Percent**
$0-49,999	46%
ACT Composite	**Percent**
19 or Below	66%
Parental Education	**Percent**
Neither parent holds a college degree	64%

The Midwest University students in this impact study were enrolled in either the Composition I treatment group or the Composition I control group through self-enrollment or at the suggestion of their academic advisor. The courses were only identifiable as Composition I courses. In fact, advisors were unaware that Midwest University was conducting a study that related to growth mindset strategies and the first-year experience, so course selection was considered randomized because students and advisors were completely unaware which courses were assigned to the treatment or control group. The maximum number of students allowed in the treatment group was pre-set at 110, which is an enrollment of 22 students per 5 on-ground courses.

The control group consisted of classes with a maximum enrollment of 22 students; these classes were selected based on course schedule and potential instructor participation. The control group was comprised of students in Composition I courses which were taught by 1 full-time instructor and 2 adjunct instructors; all 3 instructors had taught at Midwest University for several years. The control group courses were selected by the Midwest University Vice President of Academics and Accountability. The goal of the control group course selection was to choose courses that were as similar to the treatment group courses as possible by selecting control group courses that were all on-ground courses and that had a full, or nearly full, student enrollment. These course criteria were used by Midwest University administrators as the determining factors for the control group course assignment.

The data collection procedures involved administering a pre- and post-content assessment exam, which is standard practice for all students enrolled in a Composition I course at Midwest University. Both the treatment and the control groups were administered the exams by their instructors. The Composition I assessment was developed by a team of faculty members in the

English and Humanities Department at Midwest University; the exam is updated, typically about every five to six years, when there are changes to MLA (Modern Language Association) format. The assessment evaluates the course content skill set; it is a comprehensive diagnostic tool that covers the essential skills that all Composition I students should possess before moving on to Composition II. As mentioned, the English and Humanities Department considers the completion of entrance and exit assessment exams a mandatory practice for all students. The exit assessment scores are sent to the State Regents to ensure that minimum requirements are being met in the gateway courses that are taught at Midwest University. As the exam data for the control group was collected by the department Assessment Coordinator, it was made available to Midwest University administrators, as well as the impact study researcher.

The data that is needed to answer research question 1 was collected by administering a survey that assessed whether students had developed both a growth mindset (intelligence and talent domains) and a positive view on college level writing (writing domain). All students in the treatment group were administered the pre- and post-growth mindset/writing survey. The survey data was comprised of the growth mindset domain questions, and the student sample was varied in terms of ethnicity, socioeconomic status, and if a student reported as a first-generation college student. It was made clear during the courses that participation in completing the surveys was completely voluntarily, and participation did not impact student performance in the course. The growth mindset survey was administered before the treatment in week #1 of the course. The same survey was also administered post treatment in week #16 of the course to the treatment group. The control group course content did not contain any planned growth mindset strategies, so the identical growth mindset surveys were also administered to the control group in week #1 and week #16 to use as a comparison. The student surveys were matched through a

deidentification process. Only the surveys (pre and post) that were completed by the same Midwest University treatment and control students were paired and were able to be used in the analysis. The measures are described in more detail below.

Measurement and Instrumentation

Growth Mindset. In this research project, growth mindset was measured using pre and post treatment growth mindset and writing satisfaction surveys. These surveys were used to assess whether the treatment group showed more growth (intelligence and talent domains) and writing satisfaction (writing domain) after the completion of the course. The surveys were also analyzed to ascertain if student demographics impacted the outcome variables. The growth mindset domains and writing survey consists of 26 Likert scale responses that measure attitudes on growth mindset and writing satisfaction. The questions utilized a 6-point Likert-type response format including options of Strongly Agree, Agree, Somewhat Agree, Somewhat Disagree, Disagree, and Strongly Disagree. All related items can be summed or averaged to produce a mean.

The 16 survey statements designed to measure growth mindset are statements developed by Dr. Carol Dweck, so they are determined to be valid and to adequately measure a fixed or growth mindset. The questions developed to assess writing satisfaction were developed within the English & Humanities department and were also checked for content validity by the Vice President for Accountability & Academics at Midwest University. The growth mindset/writing survey was used to measure if a student had increased their growth mindset in the intelligence, talent, and writing enjoyment domains. It was necessary to run an internal consistency factor analysis to ensure commonalities of the questions within the survey and to make sure that the interrelated items measured the underlying constructs of the growth mindset domains. To

validate the construct validity of the student survey, it was necessary to run a factor analysis of the survey questions. The intelligence domain survey questions loaded on one factor, accounting for 78% of the variance. The Cronbach's alpha reliability of the intelligence domain survey question was calculated as .88, which suggests that the survey questions had a high internal consistency. The talent domain survey questions loaded on one factor that accounted for 83% of the variance, and had a Cronbach's alpha reliability of .92, which indicates a high level of internal consistency. Lastly, the writing domain survey questions loaded on one factor that accounted for 70% of the variance, and the survey questions had a reliability of .83, showing that the questions have internal consistency. In addition, the qualitative data, collected through the journal responses and exit surveys submitted as part of the impact study, was used to analyze growth mindset development in the treatment student population.

Student Entrance and Exit Assessments. In addition, the student entrance and exit assessment scores, that measure content knowledge, were analyzed. The exam scores of the treatment and the control group were compared to ascertain if the treatment group had greater gains in their exit assessment. The assessment exams contain 50 questions that cover all the required skills that are needed to have successfully mastered Composition I. As noted, the assessment was developed by the team of faculty members in the English & Humanities Department at Midwest University. The exam is updated as needed when there are changes to MLA (Modern Language Association) formatting and documentation. Every student who takes Composition I at Midwest University is administered the same assessment exams; these assessment scores are collected and sent to the State Regents at the end of each semester to ensure that students are meeting the state competency requirements.

In this impact study, student performance was measured using the student entrance and exit assessment scores that covered content knowledge. In addition, the pre-and-post treatment growth mindset domains surveys, that focused on intelligence, talent, and writing enjoyment, were used to analyze if the treatment group showed more growth and writing satisfaction than the control group. Lastly, the qualitative data, collected through the journal responses and exit surveys from the treatment group, were used to further analyze if the treatment student population group had developed a growth mindset and had increased their writing enjoyment. These three categories of data were analyzed to understand the outcomes of the impact study.

Data Analysis Approach

As noted, every student who takes Composition I at Midwest University is administered the same assessment exams, and these assessment scores are collected and sent to the State Regents at the end of each semester, to ensure that students are meeting the state competency requirements, but before analyzing the data, it was necessary to match all student pairs for the pre and post assessment scores. For the students' entrance and exit assessment scores, a paired t-test was used to detect a difference in means, using a criterion for significance of $\alpha=0.05$, which corresponds to a 95% confidence level. Regression was used to compare the growth of treatment versus control groups on changes in content assessment scores from pre to post test.

The student survey measured growth mindset content, so it was a requirement to assess the validity of this content and examine the reliability of the variables, which included validating the questions within the intelligence, talent, and writing domains. Content validity, or logical validity was used to determine if the survey measured what it was intended to measure. To make certain that the survey was considered valid, the decision was made to use the 16 growth mindset survey statements that were developed by Dr. Carol Dweck, which ensured that the survey

adequately measured a fixed or growth mindset. However, a factor analysis was still used to confirm the internal consistency of the questions. The writing satisfaction questions were developed within the English & Humanities department and were assessed for content validity by the Vice President for Accountability and Academics at Midwest University. Before analyzing the surveys, it was necessary to match all student pairs for the pre and post surveys, and then examine each variable within the treatment and control groups. Ascertaining if students have developed a growth mindset, and if they have increased their level of writing enjoyment and improvement, allows one to quantify the correlation between growth mindset and increased academic success.

Qualitive Data. The qualitative data was collected weekly from the growth mindset treatment group. The treatment group wrote in their journals, as part of the incorporated growth mindset treatment, and the students' responses were submitted digitally through Google Drive. To accomplish data reduction, the journal responses had to be sorted to highlight growth mindset associations. First, the student journal responses were saved collectively in an electronic file, and then, based on the theoretical framework, a keywords-in-context approach was used to determine if students had developed a growth mindset in the intelligence, talent, and writing enjoyment domains. It was also necessary to sort and analyze the submitted student responses for keywords related to neuroplasticity, confidence, and learning. In addition, the treatment group anonymously completed an exit questionnaire, which was submitted handwritten, and the questionnaire was also analyzed using keywords related to the growth mindset domains (see Table 6). There was not any qualitative data collected for the control group because the individual professors of the control group courses did not conduct treatment writing journals, and they did not administer the same exit questionnaire.

Chapter 5: Results and Findings

As universities are inundated with progressively more underprepared students, it is necessary to find retention strategies that will help students achieve long-term academic success. This growth mindset treatment was designed as a mixed methods study, which analyzed both the qualitative and quantitative data in order to ascertain if a composition I classroom growth mindset treatment had helped students develop a growth mindset, in the intelligence and talent domains, increase their writing enjoyment, and improve their exit assessment content scores. The impact study focused on the growth mindset treatment group as compared to an established control group, which is the group that did not receive the growth mindset treatment. It is believed that when students develop a growth mindset, they increase their confidence, and they have a greater chance of academic success, which helps increase student persistence and will lead to an increased college graduation rate. The results of the study delineated in this chapter are organized first by research question. Within each research question, quantitative results are first presented, followed by qualitative evidence.

Growth Mindset Intelligence and Talent Domains

This section details the findings in response to the first research question, do students surveyed in the treatment group have improved growth mindset in the areas of intelligence and talent? This analysis helped show if there was any relationship between growth mindset and how students answered questions on intelligence and talent domains. The analysis in Table 4 shows that the treatment students increased their intelligence growth mindset by an average of 1.34 points, which was statistically significant ($p < .05$). Even though there was a statistically significant increase in the intelligence domain, there was not a significant increase in the student survey results regarding the talent domain ($p = 0.398$).

Table 4

Paired t-test of Treatment Change in Intelligence and Talent Mindset Domains

Group		Mean	Std. Deviation	95% Confidence Interval of the Difference		p-value
				Lower	Upper	
Treatment Group	INTELPOST - INTELPRE	1.33898	4.62978	0.13246	2.54551	0.030
	TALENTPOST - TALENTPRE	0.98305	8.86195	-1.3263	3.29249	0.398

To gain a better understanding of these quantitative findings, the qualitative data were analyzed as well. The growth mindset intellect domain is closely tied to the way that students view their own capacity to learn continuously. The treatment students examined information about neuroplasticity, and after discussing brain neuroplasticity, the students in the treatment group were asked to journal their thoughts about the topic. One student noted in his journal that:

> It is possible to grow the brain by increasing someone's abilities. Everyone was taught at one point that the brain just stops growing and that there is a limit to a person's ability. As someone gets older, they can still learn something new every day. They can go to a class, practice a skill, learn a new skill, and expand what they already know. When someone says that they are not good at math, it does not mean that they are dumb; it only means that they learn math at a different pace than other people. With extra practice and time, a person who 'is not good at math' can practice problems and become a mathematician.

The scientific knowledge about growing the brain resonated with the students, and many students wrote about this concept several times in their journals. One of the students in the treatment group recorded this journal entry about brain plasticity and the intelligence domain:

> I believe you can grow your brain. After reading the article, I thought of a quote. 'Every expert was once a beginner.' The world is a very competitive place, and you have to fight for your spot if you want to be successful. Limiting what you know because you think you aren't a math person, or saying you are not a good reader, can all be changed with practice. No one else is going to do it for you.

After reading the neuroplasticity article, students also wrote about how they believed that their intelligence was not pre-determined:

> I believe the old saying, 'you can't teach a dog new tricks' is a false statement. Everyone is able to open new pathways in their own brain to be able to achieve things they never thought they could. For instance, the discussion the article brought up was telling yourself you can't do math. It stated that we do what we think that we are able to do and skip the harder questions…we fail and we get upset, but it's our own fault for not pushing the limits of our thinking and stepping out of our own personal thinking box.

The students also documented their responses about how neuroplasticity is related to the talent domain. When considering the talent domain, students realized that, due to neuroplasticity, they can practice and improve their skills and talents. One student noted that thinking about her talent and learning capacity in a new way had helped her overcome a setback. She stated:

> The brain requires exercising to keep it strong and functional, just like any muscle in the body. The best way to keep your brain alert and high functioning is by learning a new skill. Take painting for example. I have always loved painting, and it relieves me of stress, but as an athlete I struggle with the finesses that it takes to be a painter, according to my fourth-grade art teacher anyway. Ever since she told me that I lacked a special touch that was necessary, I have completely abandoned painting…until last year. Once I

> was taught that the brain can learn and adapt to make itself stronger, I began painting again. It was the absolute best decision of my life; I feel like painting has taught me how to see beauty in everything and to appreciate the little things. Although our brain does not need the same strenuous workout plan as the rest of our muscles, it is just as important to try new things and keep it active.

Another student recorded that he understood that talent, especially when learning a new skill, was something that could be developed with the growth mindset strategy involving practice and determination:

> The brain is defined as an organ that serves as the center of the nervous system. However, new research shows that the brain is more like a muscle, and the more you use it the more it changes and the stronger it gets. I could use an example about working out and how over time muscles grow and change, but I don't work out. When I think about the times in my life where I really learned something new, I think about the time when my dad taught me how to dribble a basketball between my legs. The struggle was real when it came down to it. I never could figure out how far to spread my legs or how hard to bounce the basketball. With every fail, my brain made corrections; eventually, I was able to figure out how to dribble the ball through my legs. When I would constantly practice and watch videos of people doing it, I eventually learned the right way. Looking back and reading this research, I realized no matter how old you are, your brain has the potential to master anything if you set your mind to it.

A central tenant of growth mindset is that students can become more adept at any activity, including academics, when they understand that practice and determination are part of the learning process. With this understanding in mind, a student recorded:

> Personally, I find it amazing that someone can grow their brain by continually practicing an action. I believe this has happened to me because when I was younger, everyone told me that I couldn't keep a beat. After practicing for years by just tapping the table or playing on my brother's drum box, I am now much better at keeping a beat. Also, I was always told I could not play music very well, but I kept practicing playing the piano, and now I can play a few songs. If the same principle affects the music part of the brain, then my theory is correct. I found the fact that our brains can become stronger by practicing an action fascinating, which explains why people who constantly use a foreign language can speak it almost as well as a native. It also explains why someone who was once fluent in another language can lose their ability to speak it by not practicing it for years.

The students were aware that active learning, in the growth mindset intelligence and talent domains, involved continuous practice and determination. One participant journaled about the need for determination, stating:

> When I began Composition I, I felt like I was at a disadvantage because of my age and also being a few years out of high school. Yet, I began learning the things I can change and the things I can accomplish throughout the weeks of going to class and listening to the professor talk about a certain writing/reading lecture. From my continuous dedication to try to learn and comprehend the material in front of me, I began to enjoy my time in class as well as enjoy writing the topic of discussion during every session. I know that this education will help me advance into classes that will be tougher and will expect more from the student, but I am willing to continue that journey of learning continuously. I am willing to work harder at processing the information and making sure I can do better on exams and finals. With a strong mentality and a 'go get em' attitude, anything is

possible. The thing to remember is you have to work harder and make sure you stay focused on the task.

When students were determined to practice and succeed, their perspectives changed. One treatment student wrote in her journal, “I feel so much better about writing; I had a lot of practice. I feel stronger.” The treatment allowed students to realize that practice and hard work were needed for success, and this realization was documented by a student who wrote, “As long as I work hard, I will succeed.” Additionally, a treatment participant acknowledged this realization when she journaled, “we have to go out and do what is best for us. It is okay to struggle because not everything is going to come easy in life.” The growth mindset treatment allowed students to realize that brain neuroplasticity meant that they had the opportunity to work hard and choose to develop their academic skills, which proved to be empowering for many of the students.

Students also viewed the “Power of Yet” video, by Dr. Carol Dweck, and they recorded journal entries discussing a fixed versus a growth mindset. The “Power of Yet” video helped to solidify the growth mindset concepts, that include the intelligence and talent domains, and after watching the video, one student noted, “the video on fixed versus growth mindset helped me realize it was possible to improve; all I had to do was change my perspective. I was fairly confident in my reading comprehension and writing abilities before…I am even more confident in my abilities now. I feel that even if it seems overwhelming at first, I will be able to succeed if I keep a growth mindset.” Another student said, “I will remember the TedTalk about mindset the most. It impacted me.” The growth mindset discussion led a student to write, “anyone can expand their knowledge if they put forth the effort. There is no limit on how much knowledge you can gain. The world we live in evolves every day, giving us so many opportunities to learn

and acquire new knowledge." Another student stated, "I feel that we can always learn new things and new ways to do things."

Lastly, the intelligence and talent domains allowed students to recognize that they must accept challenges and risks, and one student stated, "the way you challenged us has helped me challenge myself." Another student in the treatment group documented how she challenged herself to take risks when she stated, "we need to challenge our brains and do the things that scare us to break through those hidden pathways. Only then will we be able to harness our full learning and understanding ability. Telling ourselves that we can't do things is our own personal downfall." Despite the quantitative findings regarding the talent domain data, students still reported in the qualitative data, that after the growth mindset treatment, they felt personally satisfied with their performance in the course. One student reported, "this course was a wonderful learning experience. I am happy with myself. I have done much better than I expected." As noted, before, the growth mindset treatment created an environment where students viewed the learning process in a new way, and the collected qualitative data indicated that students had developed a growth mindset in both the intelligence and talent domains.

It was hypothesized that students who were surveyed in the treatment group would have improved growth mindset in the areas of intelligence and talent. The quantitative data and the qualitative data both showed that students in the treatment group showed growth in the intelligence domain. The quantitative data showed that students increased their intelligence by an average of 1.34 points, which was statistically significant ($p < .05$). The qualitative data showed that students believed that they had increased their capacity for brain growth, they reported that they had become more determined students, and they were better able to welcome challenges. The quantitative data showed that, even though there was a statistically significant increase in the

intelligence domain, there was not a significant increase in the talent domain (p = 0.398). However, the qualitative data revealed that students understood that it was necessary to practice skills, which can be directly related to how students perceive talent.

Writing Enjoyment and Increased Confidence

Research question 2 asked if students who are exposed to a growth mindset treatment enjoy writing more than the control group. The writing survey pretest and posttest changes were analyzed using a paired samples t-test. Analysis reveals that the treatment group, with greater than 95% confidence (p-value <0.01), had an improvement in their writing domain results with a mean change in writing enjoyment of 5.7 (see Table 5).

Table 5

Paired t-Test Comparison of Writing Domain Pre and Post Tests

Group		Mean	Std. Deviation	95% Confidence Interval of the Difference		p-value
				Lower	Upper	
Treatment Group	WRIQPOST_SUM - WRIQPRE_SUM	5.67797	9.06384	3.31592	8.04001	0.000
Control Group	WRIQPOST_SUM - WRIQPRE_SUM	6.92308	11.54312	-0.05236	13.89851	0.051

The results indicate that both groups increased their scores in the writing domain (the control group, D (change) = 6.92, SD = 11.54, p = .051); however, the control group was non-significant, perhaps due to the small sample size impacting statistical power, which could have contributed to missed detection. Perhaps the substantially lower variance in the treatment group also suggests that there was something about the treatment that reduced the variation in the scores.

Upon analyzing the qualitative data, students reported that an increase in writing enjoyment also indicated that they had increased their confidence in their writing ability. Initially, many Midwest University students reported feeling unsure as to whether they possessed the skill set needed to be successful in college. The student reflections that were recorded post-treatment often documented the fear, uncertainty, and general anxiety that students felt at the beginning of the course. One student stated, "I was worried about this course because I've never been a good writer. I'd rate that I was about a 3 on a scale of 1-5." Many students seemed to share this same type of fear about beginning the course:

> Before the course began, I had very little confidence in my ability to write an essay. Now having completed the course, my confidence level is where it should be. Since the beginning of Comp 1, I have sensed a difference in the way I analyze passages and in the way I write. I now feel confident that I can read a passage, develop well thought ideas, and produce an essay explaining the theme or tone of the passage. Before Comp 1 my ideas would be vague and rushed, but now I believe myself to be a good and strong writer. Going into the semester, I was worried that I would struggle, but now I feel more confident and am not worried about future college classes. I know that I will be fine in any class I take as long as I work hard.

Another student documented, "I hated writing. I absolutely dreaded writing papers, but I feel much less anxious about writing now. I still have progress to be made, but I really feel better about it in general." An additional treatment participant wrote that the class "made me enjoy writing more and feel more confident in my work. It helped me feel a lot more comfortable with writing (which is definitely essential for college)." Another student said, "I feel a lot better [after this course] and it gives me more drive to continue. What I learned the most from this course was

that you can actually enjoy writing." And finally, after completing the course, an additional treatment student stated:

> I feel a lot better and it gives me more drive to continue. I was unsure and was worried my writing wouldn't meet college expectations. Now, I feel prepared and am ready to take more courses. I feel confident."

In their journals, students repeatedly reported that their confidence in their writing had increased. By the end of the course, however, not only did their confidence increase, but also their enjoyment of writing.

By the end of the semester students seemed to adopt a growth mindset, and they realized that it is necessary to continually practice developing their writing skills. One student wrote in her journal about this mindset, saying, "I definitely feel better about my writing skills. I learned that there is always room for improvement." Another student in the treatment group said, "I feel that my education is extremely valuable and that I can learn so much more if I work hard. This course has MADE my reading and writing skills. I am improving them for future courses." Students documented how they realized that practice had helped them improve in the course, and this type of improvement had enabled the students to enjoy the writing process, a process that many of the students had very much disliked at the beginning of Composition I.

Most of the treatment students did not enjoy writing at the beginning of Composition I, by the conclusion of the course, however, the students reported that their writing enjoyment had increased. One student recorded this type of change, saying, "I felt as if my reading and writing were more zombie-like before. Meaning, I only wrote to get a grade. Now, I write as myself and to get good grades. It's a lot more enjoyable. This class gave me the strength to tap into my inner self and absolutely enjoy reading and writing…it was one of the best experiences I've had in

college so far." This sentiment was echoed by another student who wrote, "This course has influenced me so much as a writer. Before taking this course, I thought I hated writing and now I enjoy it," and yet another student wrote, "I feel ready to tackle any essay that comes my way. This course has not only made me a better writer, but it has allowed me to enjoy writing more." By changing the way students viewed learning, the treatment students stated that they were able to start enjoying the writing process, and one student commented, "I feel as though I enjoy writing more and feel as though I am a better writer. I did not enjoy reading or writing very much at all. Now, I feel significantly better. I feel as though I learn quickly." Additionally, a treatment student seemed to understand that he had improved his writing skills when he said:

> I honestly felt like I sucked at reading and writing. I feel better now, and I understand how to make my essay better. I feel like I learned a lot of new ways to make English a better subject for me. It has made me a better writer.

Yet, another student stated, "I enjoy English more now. I have learned more about my writing style, and now I am more excited to write in the future," and finally, a student said, "this course has influenced me so much as a writer. Before taking this course, I thought I hated writing, and now I enjoy it!"

Many students start college thinking that they are not ready for the rigor associated with university coursework. Freshmen year of college in a gateway course can be challenging, and at Midwest University, where historically 54% of students are first generation college students, the first year of college can be even more intimidating. A student in the treatment group conveyed this fact when he said:

> My way of studying and confidence has certainly changed throughout my freshman year of college, and I will be forever grateful for that. Freshman year of college is always said

> to be the most stressful because everyone is having to adapt to a new setting and professors, and I can agree to that statement. However, just in my first semester of freshman year I learned a considerable amount of information that will help me through the rest of my college career.

Another treatment student journaled about how her confidence level and feelings of success had grown since the beginning of the semester:

> Overall, my first semester of college has turned out to be a success. All my worries about the rest of my college career faded away, and I now have a new positive outlook. Learning how to create more time to study and using that time effectively was by far one of the biggest things that helped me get through this semester. Becoming more confident in my own work and putting use to the skills I was being taught molded me into a better college student and a better person. I will always be appreciative of my first semester of college.

At the end of the course, students reported that they now enjoyed writing more, and they documented that they also had greater confidence in their writing abilities. Many of the treatment students documented that they had changed their view of the subject matter, and one student noted her change in the way she perceived writing, saying, "I didn't like reading and writing. I despised it. I would do what I could to avoid it." But after the treatment, this same student said, "I am extremely comfortable with my writing abilities and the different types of writing. It changed my mind on how I feel about writing. I feel more confident. I feel like I can write a much better paper now." Another treatment student wrote:

> When I first came into the first semester for comp 1, I was a little timid writing papers because I wouldn't know what to write, so I would get frustrated. Thanks to you teaching

> us more about writing and grammar, throughout the semester I started to gain more confidence in writing. Now I still get a little nervous, but I come in more confident and prepared to start writing my paper. I think that I am more prepared for next year's comp 2 papers and assignments.

Students documented time and time again that writing had been one of their least favorite subjects prior to the intervention, but after the growth mindset treatment, students wrote about the change in their views, and one student recorded, "I've learned a lot in this class, but I would have to say what I have learned the most is how to be a better writer. Not going to lie, I hated both [reading and writing], but it's a lot easier, and I feel a lot more confident doing both. I feel pretty good about my education and the way I learn because this course has helped me with both." Another student stated, "I feel I can do anything that involves writing." Finally, one student wrote "I'm confident in anything I decide to pursue in my future. This class allowed me to develop new ways of learning and opened my mind to see from a different perspective on life."

One treatment student recorded, "After taking comp 1, I feel more confident in my writing, and it's not as scary as I thought going into it." Another student wrote that the "class helped me tremendously with understanding and writing papers. I went into my first semester of college thinking Composition I would be the hardest subject for me to conquer, but it quickly became one of my easiest classes…" An additional treatment student wrote about how the Composition I treatment had inspired him to persist, writing, "through all of these strengths I gained while in Composition I, I feel more prepared to take other college courses." Finally, a student wrote, "I feel more confident when writing papers. I was nervous and thought it would be hard, but I feel like I did very well, and it wasn't as hard as I thought. I feel confident going to

Comp 2 next semester." The students' increased confidence allowed them to become more engaged in the learning process, which ultimately helped students envision completing more courses and being successful in their college journey.

The treatment students wrote about their confidence in their journals, and they also completed an end-of-course questionnaire. The students in the treatment group repeatedly reported that their confidence had increased, they had enjoyed the course, and their writing skills had improved. Of the 97 students who filled out the questionnaire, 84 (86.60%) reported that they had not enjoyed writing before entering the Composition I course. After the treatment, 82 (84.54%) had enjoyed the course, 87 (89.69%) felt that they had improved their writing skills, and 83 (85.57%) believed that they were more confident in their writing after completing the course and receiving the growth mindset treatment (see Table 6).

Table 6

Midwest University Treatment Group Writing Enjoyment and Increased Confidence

97 students responded **Response**	**Count**	**Percent**
More confident	83	85.57%
Like writing more than before the course	32	32.99%
Writing skills improved	87	89.69%
Enjoyed course	82	84.54%
Did not enjoy/hated writing before course	84	86.60%

The students reported again and again that they had increased their confidence level in their writing abilities, but they had also changed the way that they thought about learning, which was a main goal in the design of the treatment. The recurring theme with many students was that not

only had their confidence level increased, but they now viewed their education differently, as something to be valued:

> My thinking has changed in the respect that the more I learned, the more confidence I gain about a specific subject. I am more confident that I am able to master English Literature and composition by the end of the next semester because of the skills that were taught to me. She [the professor] used positive reinforcement to help me gain my confidence and boost my overall thought process even about algebra. I am now able to look at English as a subject and not frown about it because I am way more knowledgeable about the subject.

The treatment increased the students' level of confidence, and this increased confidence seemed to change the students' thinking over the course of the semester. As one student stated, "I think that the way I learn and process knowledge has changed since the beginning of Composition I…writing is still a difficult subject for me, but since taking this class it has become easier and given me more confidence." Another student in the treatment group indicated that he had changed his view on learning and increased his confidence level. He stated:

> Composition I has not only changed the way I think of learning, but it has also changed the way I learn. In this class, I experienced new ways of learning…this class also helped me improve my confidence for any further courses I may face before I reach the end of my college career. We wrote many essays that were all explained with in depth precision and learned many new skills that allowed our class to become the best writers we could possibly be.

An additional treatment participant acknowledged that she also looked at the writing process in a new way when she stated, "I think my way of thinking has changed dramatically, I look at

questions differently and try to think in advance of what I'm going to write." Still another student stated, "My thinking has changed since I started college courses…I have never felt more confident." Finally, a treatment student wrote about how this change in his thinking had made him confident that he would continue on in his college journey:

> My thinking and obtaining of knowledge have greatly changed, especially when compared to my high school days. Although I'm able to quickly process information, it really wasn't until my first semester at college that there's more to it, than just words and numbers on a piece of paper, seemingly that's how high school was. I was not really learning anything that can be applied to the real world. I believe writing for me is getting relatively easier as I go on, and stuff like that just takes time. I will definitely be in Comp II.

The qualitative data indicates that students felt that they had improved their writing skills, and improvement had given students the determination to conquer their fears and persist in their college journey. Another result of the growth mindset treatment is that student began to view their education in a different way.

Students seemed to grasp that having a growth mindset changed the way that they viewed education and their own world perspective. One treatment student also wrote about how she now viewed her education differently and stated, "I feel that my education is extremely valuable and that I can learn so much more if I work hard." Another student wrote, "I feel that my writing skills have gotten stronger, and I feel that I will eventually pick books back up because books = knowledge=power!" Yet another student recorded, "I believe that this course made me more confident in my writing and has helped me in other courses as well." Additionally, a student wrote, "Hey, if I can do this, what else can I do? I feel that I am a prime scholar who is ready to

learn and take on the world." Lastly, a student wrote, "I didn't think I was ready for college, but I'm ready for more challenges in life." This assumption, that students were ready for additional challenges, seemed to be a common belief amongst students in the treatment group.

Many students enter Composition I feeling defeated as a result of their prior experience in high school English classes, but students in the growth mindset treatment wrote emphatically about how much they had enjoyed the course. As one student noted in his reflection, "last year in English…it sucked the life out of me." However, he had noticed that in this growth mindset treatment class, "everyone was happy to be here." Another student documented how she had enjoyed the classroom experience:

> My writing skills got a lot better. I feel more confident when writing an essay. I have learned a lot of great tips/strategies to improve my writing. I still don't enjoy reading but feel like I have gotten better. I loved coming to this class every day.

These types of student comments are indicative of the research findings that show that a growth mindset can increase student satisfaction, which is a needed component for student retention.

Another strategy in the growth mindset treatment involved increasing students' writing enjoyment through the development of student autonomy. One student noted how autonomy, and particularly being able to choose interesting research topics, had changed his worldview:

> Comp has changed my mind on writing entirely. I always have thought that writing is important and essential, but the fact is that I never really got into it, probably because of the extremely narrow topics we had to write about and emphasize when I was in public school. But when I went to college it did a 180 and allowed a much more broad array of topics to choose and write about, which I found highly beneficial in the regard that if I find something I know absolutely nothing about, but was interested in researching it, I

could study on the topic, write the paper and turn it in for a grade on the particular essay (argumentative, compare and contrast, descriptive, narrative, etc.) College writing has in a sense given me a more broad and open-minded view of the world.

Another student stated, "I enjoyed picking my topics for my essay. I liked that I learned new things and got to write about things that interested me." This increased level of autonomy allowed students in the treatment group to increase their enjoyment of writing and their overall course satisfaction. The growth mindset treatment allowed students to no longer fear how they were perceived, and instead, they were free to learn. The students increased their confidence level and enjoyment of writing, and this increase in confidence and enjoyment were paramount for helping students successfully navigate the course. The treatment was deemed impactful when considering both the quantitative and qualitative findings. It was determined that growth mindset strategies can help students to develop better writing skills, which leads students to have a greater level of confidence and course satisfaction.

When examining the hypothesis that students who are exposed to a growth mindset treatment during their Composition I gateway course will enjoy the writing and learning process more than students who are in the control group, the analysis revealed that the treatment group, with greater than 95% confidence ($p < 0.05$), had writing domain improvement with a mean of 5.7 (see Table 5). The control group also had an improvement in the writing domain, but the small sample size made it difficult to validate the statistical significance of the finding. The qualitative data was consistent with the quantitative data by showing student improvement and satisfaction. The students reported that they had started their composition course with a great deal of fear and angst because they generally did not enjoy writing, but by the end of the course their mindset had changed in regard to the writing domain. Students stated that they now enjoyed

writing and that they viewed the learning process differently after the growth mindset treatment. Additionally, students reported that their view of education had changed and that, post-treatment, they now had an increased level of confidence. Thus, the quantitative findings are unclear when determining if the treatment group enjoyed writing more than the control group, however; the data is clear that students in the treatment group did increase their writing enjoyment

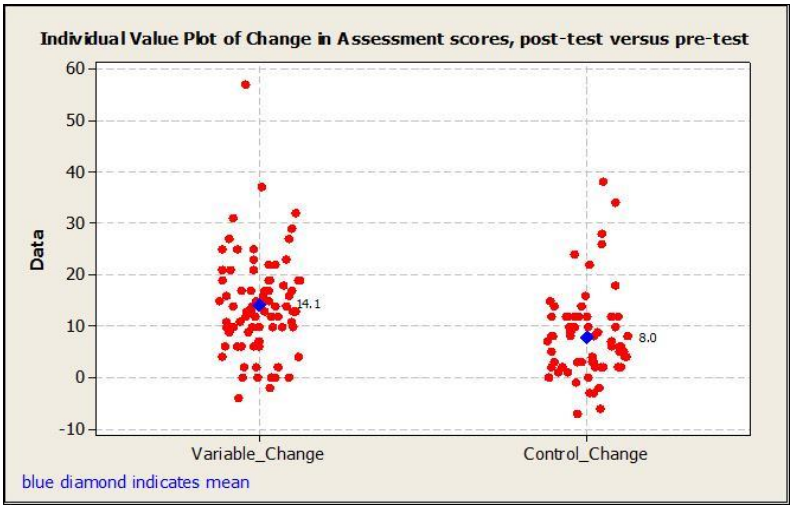
Content Assessment Scores

When analyzing research question 3, it was asked if the exit assessment scores of growth mindset treatment students would be higher than those of study control students. It was believed that students who were exposed to a growth mindset treatment would be more open to learning goals, and as a result, the treatment exit assessment scores would be higher than those of the control group students. In order to make this determination, it was necessary to make sure that there were related pairs in both the treatment group and the control group. Before beginning the analysis, the student data sets (pre-tests and post-tests) were matched by an assigned number, in order to deidentify the treatment and control group participants. Once these student data sets were matched, the dependent variable was then measured at the beginning of the growth mindset treatment period and at the end of the treatment period by analyzing the pre-assessment and post-assessment results.

The scatterplot (see Figure 2) indicates that the treatment group post-test results showed an improvement over the pre-test mean. The post-assessment mean, administered at the conclusion of the growth mindset treatment, indicates that there was increased content knowledge within the treatment group over the course of the semester. The p-value for the treatment (variable) group were all < 0.01, or greater than 99% confidence in rejecting null hypotheses and declaring that there was an improvement.

Figure 2.

Plot of Treatment versus Control Group Change in Content Assessment Scores



Accordingly, the paired t-test for the treatment group (Table 7) indicates an increase in the mean score from the pre-test (64.5) to the post-test (78.6), with a mean difference of 14.1, which clearly shows content assessment growth within the treatment group.

Table 7

Paired t-Test of Treatment Group Change in Content Assessment Scores

	N	Mean	Std. Deviation
Treatment post-test	81	78.679	10.0671
Treatment pre-test	81	64.5309	11.7261
Difference	81	14.1481	9.5957

95% CI for mean difference: (12.0264, 16.2699)

t-test of mean difference = 0 (vs not = 0): t-value = 13.27 p-value = less than 0.01

A paired t-test was also used to analyze the pre-test and post-test growth for the control group (Table 8).

Table 8

Paired t-Test of Control Group Change in Content Assessment Scores

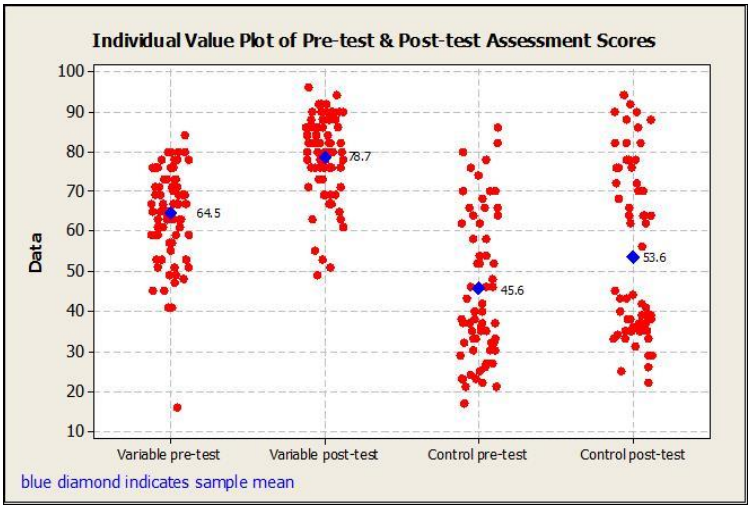
	N	Mean	Std. Deviation
Control post-test	65	53.5692	21.3892
Control pre-test	65	45.5846	18.940
Difference	65	7.98462	8.64489

95% CI for mean difference: (5.84252, 10.12671)
t-test of mean difference = 0 (vs not = 0): t-value = 7.45 p-value < .01

Table 8 shows that the control group had a pre-test mean of 45.5, which was a lower starting mean than the treatment group. The post-test mean was 53.5, with a difference of 7.98, which indicates that the treatment group mean improvement was decidedly higher than that of the control group. Figure 3 represents a plot of the content assessment scores for both treatment and control and pre-and post-t-test.

Figure 3.

Plot of Treatment versus Control Group Pre and Post-Test Assessment Scores



Lastly, a simple linear regression of the change in pre-post assessment scores was used to show that there is a difference between the two groups' before and after improvements. The results of this test provided evidence that there was an improvement before and after, for both the

treatment and control groups for both the entrance and exit assessments. The treatment group average scores on the pre-test, with a mean of 64.5, were significantly higher than the mean of the control group of 45.6 ($p < .01$), and the post-test treatment mean was 78.7, compared to a control group post-test mean of 53.6, which was also significantly higher ($p < .01$). Table 9 shows that both groups grew over time, which is to be expected, but the treatment group grew substantially more on average when compared to the control group (control B = 7.985 points, treatment B = 14.19 points, $p < .001$, B = unstandardized coefficients), which indicates that the treatment group showed greater improvement in the content assessments.

Table 9

OLS Regression of Change in Content Assessment by Treatment/Control

Model	Unstandardized Coefficients		Standardized Coefficients		
	B	Std. Error	Betaβ	T	Sig.
(Constant)	7.985	1.139		7.008	0.000
Treatment	6.164	1.530	0.318	4.030	0.000

Note. B = unstandardized coefficients

Hypothesis 3 states that students who are exposed to growth mindset strategies in their Composition I gateway course will be more successful in their exit assessment of measurable content knowledge than will the students who are in the control group, and after analysis, it was found that the treatment (variable) group average changes are statistically different (higher) for treatment versus control, at $\alpha = 0.05$ (See Figure 3 and Tables 9 and 10), so the data is in line with that assumption that the treatment group scores would show greater improvement than those of the control group.

As noted, the quantitative data showed an improvement in the treatment groups exit assessment scores, and the qualitative treatment data also documented that students felt that they had increased their content knowledge and confidence in the course content. This content knowledge was closely tied to process-oriented feedback. Students repeatedly stated that they had been nervous or scared at the beginning of the course, but process-oriented feedback helped to increase their confidence. Students also felt that the process-oriented feedback was helpful, instead of judgmental, and one student stated:

> In this class we were always getting feedback on our writing. This helped me to understand what to look for in my own writing, and I eventually began to pick up on these things before turning a paper in. During the class we wrote many types of essays. I gained an understanding of what each kind of essay was looking for and how to effectively write it. One of my favorite things about the class was becoming more comfortable with others reading my writing. Gaining all of that knowledge led me to become a much better writer and be more confident in my writing skills.

Another student wrote about how this type of feedback is impactful, stating, "this course has given me an insight of what a college class is like. As a concurrent student, I was nervous to be here. You allowed for me to become more confident with my writing. I will remember how you took so much time to correct my mistakes and actually show where I went wrong on my papers." The growth mindset initiatives, particularly process-oriented feedback helped students feel that they possessed the needed skills to be successful during their college journey.

The growth mindset treatment also used faculty and peer support which helped students form connections, and one student in the treatment group noted how this type of professorial support, combined with the support of his peers, was transformative:

> When the course began, I was terrified I was not going to perform very well. This is primarily due to my lack of writing skills. I thought my skillset was behind a grade level. As the course went on, the help I received from my professor and classmates through the peer editing was very beneficial. The peer editing gave me the feedback and insight with constructive input on how to improve my paper. The constant help allowed me to better my writing skills when composing papers and writing the final drafts. With this class under my belt, I feel more confident that I will succeed in writing papers throughout my college career.

Another student in the treatment group wrote about this type of faculty level support and stated, "coming into college I was very stressed, and this class made me realize that it was not that bad and that your instructor does care and want the best for you."

Part of the reason that students felt confident coming to class can be attributed to the growth mindset strategy that encouraged faculty and campus connectivity. To encourage this type of connectivity, HELP conferences were established with each student. During the conferences, students began to realize that asking for help was essential for doing well in the course, and one student stated, "I feel that as long as I can say I need help when I need it, I will be fine. It's not nearly as scary as I thought." Students seemed to understand that asking for help was not a scary task or a sign of weakness, and one participant stated, "What I learned from this course is that writing isn't as scary as I thought. The most important thing is to just do it and get help." Another student found that the conferences were beneficial because of "how open it was to ask questions and to get help." Additionally, a student stated, "I really enjoyed the entire class, but I really liked the one on one questions we got to have with the instructor." Students journaled again and again about faculty support. However, peer connectivity was equally as important, and

this fact was noted in a treatment journal response when a student reported, “Perhaps my strongest memory of this class is when one of my peers asked me directly if I would edit his paper because he wanted a good grade. It was nice to know that I was helping my peers grow as writers.” This type of campus connectivity is essential for students to begin to develop a growth mindset, which enables students to enjoy the writing and learning process.

Scaffolding was also part of the treatment design, and students journaled about how this teaching method, based on practice and determination, was impactful. One student stated, “I was very unsure of my writing skills and reading skills before the semester. I had only done one research paper prior to this. I liked how you did not just give us assignments and let us figure it out by ourselves, but instead, you let us practice on the little stuff and then build up towards the bigger stuff…I feel like my writing skills have increased tremendously.” Process-oriented feedback, building connectivity, and scaffolding all created an environment where students were prepared to master content and improve their exit assessment scores. It was these strategies that helped contribute to the treatment groups’ overall academic success, and this content mastery was significant from both a quantitative and qualitative analysis.

Hypothesis #3 asserts that students who are exposed to growth mindset strategies in their Composition I gateway course will be more successful in their exit assessment improvement of measurable content knowledge than will the students who are in the control group. Overall, this hypothesis was supported. The quantitative data showed an improvement in the treatment groups exit assessment scores, from the pre-test (64.5) to the post-test (78.6), with a mean difference of 14.1, which clearly showed content assessment growth within the treatment group. The control group had a pre-test mean of 45.2, and the post-test mean of 53.5, with a difference of 7.98, which indicates that the treatment group had greater content knowledge gains. The regression

revealed that there was an improvement in assessment scores over time for both groups, but that the treatment group increased by a substantially higher amount than the control group. The qualitative treatment data is in line with that of the quantitative data. The qualitative data documents that students felt that they had increased their content knowledge and confidence in the course content. The qualitative data references that students felt that the process-oriented feedback, the HELP conferences, and the course scaffolding were all strategies that were instrumental in contributing to content knowledge growth and confidence.

The Demographic Impact on Outcomes

Finally, the last research question to be examined asked how student demographics might moderate the relationship between the growth mindset treatment and the outcome variables. Much of the empirical literature has shown that growth mindset can be even more impactful for certain student demographic indicators, such as socioeconomic status and ethnicity, so this research question explored this potential relationship. When analyzing research question 3, it was necessary to run a regression, to compare how student demographics impacted the different outcomes. During the survey, students were asked to self-report their ethnicity, their household economic status, and the completion rate of their parents' highest level of education. It was also necessary to use a one-way analysis of variance (ANOVA) to test for differences in growth mindset intellect, talent, and writing satisfaction domain scores to examine the demographic subgroups. For research purposes, it was asked if there had been a statistically significant increase in these measurements across subgroups including first generation students, students of color, and students with a low socioeconomic status, and all independent variables were analyzed to note any statistical differences.

When analyzing the data on demographics, results showed that treatment group students did not differ in terms of first-generation status, low income, and race (see Table 10). However, non-low income, non-first-generation students of color did exhibit significant declines in comparison to other student groups.

Table 10

OLS Regression of Treatment Group Pre-Post Differences in Growth Mindset Domains by Student Demographics

Dependent Variables	Model	Unstandardized Coefficients B	Standardized Coefficients Beta	t	Sig.
Writing	(Constant)	3.35		1.588	0.12
	First_gen	0.238	0.015	0.091	0.93
	SoC	0.201	0.013	0.089	0.93
	LINC	3.24	0.203	1.186	0.24
Talent	(Constant)	1.524		0.624	0.54
	First_gen	3.442	0.184	1.135	0.26
	SoC	-5.484	-0.303	-2.1	0.04
	LINC	0.562	0.029	0.178	0.86
Intelligence	(Constant)	0.573		0.408	0.69
	First_gen	0.199	0.02	0.114	0.91
	SoC	0.976	0.1	0.651	0.52
	LINC	1.026	0.098	0.564	0.58

Note. First-gen is first generation students, Soc is students of color, and LINC is low income or students with low socioeconomic status.

The intelligence and writing domains results were not found to be statistically significant for any of the student subgroups. Due to confidentiality concerns, the collected qualitative data was not categorized by student demographics, so it is not possible to present qualitative data specific to minorized students to affirm or contradict these findings, but it is interesting to note that the

qualitative data did show that students overall perceived that they had improved in all three of the growth mindset domains of intelligence, talent, and writing, and that recorded data pertained to all students in the growth mindset treatment. As mentioned previously, the treatment and control students identified their ethnicity as 46% non-white, or students of color, 64% identified as a first-generation college student, and 46% reported as having a low socio-economic status (see Table 3), so the student qualitative data has validity when considering these student demographics. It is interesting to note, that when considering these demographics, the student population for the treatment group repeatedly reported that they had improved their confidence level, writing ability, and writing enjoyment, which is indicative of an increase in growth mindset domains (see table 6).

Hypothesis #4 states that growth mindset strategies, used in a gateway course, have a greater positive impact on the intelligence, talent, and writing domains for first generation students, lower socioeconomic status students, and/or students of color. Overall, the quantitative evidence did not support this hypothesis, though because the sample sizes in some of these groups were low, it could be that the study lacked the statistical power to truly make assumptions based on the collected data. Though the qualitative data for all students, regardless of demographic variables, showed uniformly that students had experienced growth in all three growth mindset domains, there is still some question as to whether or not it is true in particular for minoritized students in this sample.

Chapter 6: Discussion and Conclusion

This impact study was designed to establish a relationship between a growth mindset intervention and improved academic success. This assumption was based on the literature review and past classroom observations. Based on the literature review, it was hypothesized that growth mindset would positively predict increased academic success and an increased level of writing enjoyment. After examining prior research, it is believed that when students are encouraged to develop a growth mindset during their college career, they will become more academically successful (Aditomo, 2015), so it is further believed that students who are part of a growth mindset treatment during their gateway writing course will develop a growth mindset, and as a result, they will have improved academic success and greater persistence. The literature regarding growth mindset clearly demonstrates that students can develop a growth mindset, which is the belief that intellect can be developed over time; how students view their intelligence correlates with the likelihood they will conquer academic setbacks (Dweck, 2006; Dweck & Leggett, 1988; Molden & Dweck). Research also suggest that growth mindset increases the chance of achieving academic improvement (Rattan, Savani, Chugh & Dweck, 2015). Additionally, evidence suggests that students who are first generation college students or who are from low socioeconomic backgrounds enter school with a fixed mindset; this type of mindset can be detrimental to student success, persistence, and motivation (Broda, Yun, Schneider, Yeager, Walton, & Diemer, 2018). With this research in mind, it is necessary for universities to incorporate growth mindset strategies into gateway writing courses as well as other preliminary coursework.

This impact study was designed with careful consideration of the literature; when reviewing the empirical literature, there is a strong indication that when students are taught how to develop a growth mindset, they are ultimately more successful in a rigorous academic

environment (Dweck, 1999, 2006). When considering Hypothesis #1, which states that students who are surveyed in the treatment group will have improved growth mindset in the areas of intelligence and talent, the research showed that students grew in the intelligence domain. The quantitative data and the qualitative data findings indicate that the students in the treatment group showed growth in the intelligence domain. As mentioned, students increased their intelligence by an average of 1.34 points, which was statistically significant. The recorded qualitative data also indicated that students felt more determined, had a greater capacity for working through challenges, and that they believed in the science of neuroplasticity. The talent domain did not see a statistically significant increase, but the collected qualitative data on the talent domain made it evident that students realized that they had to practice and work hard to increase a talent or skill set.

Hypothesis #2 stated that students who are exposed to a growth mindset treatment during their Composition I gateway course will enjoy the writing and learning process more than students who are in the control group. Results of the impact study's quantitative data indicated that the treatment group had increases in writing domain improvement. It was noted that the control group also had improvement in the mean score, but this change was not significant. It could be that the sample was small and thus the analysis lacked statistical power. Students' collected qualitative data reported that the treatment students felt like they had combatted the fear that they had when first entering a gateway writing course, and many of these students expressed that they now enjoyed the writing process and had increased their confidence level in regards to academics. Even more importantly, students reported that they perceived the educational process in a new way, and they now valued and appreciated the learning process.

The assertion of Hypothesis # 3 is that students who are exposed to growth mindset strategies in their Composition I gateway course will be more successful in their exit assessment improvement of measurable content knowledge than will the students who are in the control group, and there was an improvement in the treatment groups exit assessment scores. The control group also showed growth in the mean exit assessment score, but the treatment group had a larger mean pre-test to post-test difference. The treatment group's mean improvement was 14.1 whereas the control group's mean improvement was just 7.98, demonstrating that the treatment group had greater improvement in the quantitative data. The qualitative data also showed that students had improved in their content knowledge, and students felt an increase in the confidence and ability level, due to the implementation of process-oriented feedback, HELP conference, and course content scaffolding.

Finally, Hypothesis #4 states that growth mindset strategies, used in a gateway course, have a greater positive impact on the intelligence, talent, and writing domains for first generation students, lower socioeconomic status students, and/or students of color, and the demographic data did not indicate that there was growth for the student populations in the growth mindset intelligence or writing enjoyment domains. There was non-significant growth noted in the talent domain by first generation students and low-income students, but the analyses did lack statistical power to draw a definitive conclusion. In regard to the findings for students of color, some researchers do not find this outcome entirely surprising. According to Dr. Luke Wood, professor of education at San Diego State University, growth mindset is not sending an entirely correct message, especially in growth mindset treatments involving male students of color. Dr. Wood believes that male students of color need to have their effort *and* their ability praised because many times students of color have little to no confidence in their own abilities. Dweck responded

to this criticism by saying, “we agreed that for some students, especially those laboring under negative stereotypes about their ability, reassurance about ability can be important. ‘I believe in your ability to do this’ can be an important message” (Dweck as cited in Ruth & Cavanaugh, 2017, para. 4.).

Despite a strong empirical connection between growth mindset interventions and improvements in academic growth for students of color and students with a low socioeconomic status, the findings of this impact study did not show a statistical difference for these particular student demographics from a quantitative standpoint. However, the impact study analysis indicates that many of the treatment students who reported as first-generation students, low socioeconomic students, and students of color did show a qualitative improvement in the growth mindset domains. All of the students in the treatment group wrote about their increased confidence and improved writing skills, so the qualitative data shows growth in the intelligence domain, the talent domain, and the writing enjoyment domain, for all students, regardless of demographic variables.

Undoubtedly, demographic characteristics and their impact on growth mindset interventions is an area that needs to be further explored in future research. Because minority students and English language learners have lower retention rates than white students (Garcia, 2010; Swail, 2004), intentional strategies are needed to increase the retention rate for all students (Mozella, 2010). Some growth mindset interventions have been successful at reducing achievement gaps for females and students of color (Aronson et al., 2002; Blackwell et al., 2007; Miyake et al., 2010; Walton & Cohen, 2007, 2011; Yeager, Walton & Cohen, 2013), but in light of the recent research regarding growth mindset interventions and students of color, this impact study shows that there are additional strategies that need to be examined and implemented into

university gateway courses to further assist all student populations. It is also suggested that further research do a more in-depth examination of the interaction between the demographic variables.

At Midwest University, many students are first-generation college students, and there is often the perception that a college degree is unobtainable. A growth mindset intervention can potentially increase retention and full-time enrollment for these student populations. PERTS (2017) conducted a growth mindset intervention and found that it "increased the percentage of full-time enrolled minority and first-generation students from 69% to73%, cutting the inequality gap by 40%" (p. 9). Growth mindset strategies have been successfully incorporated into college math courses, which have been particularly effective for female students (Degol, Wang, & Zhang, 2017; Silva & White, 2013). However, there is not empirical research that shows the potential benefits of using growth mindset in a gateway writing course. Not only can this type of growth mindset intervention afford students the opportunity to improve academically, studies have also found that mindset interventions can provide long-term academic growth and success (Wilson & Buttrick, 2016).

The use of growth mindset strategies in this treatment allowed the students to identify their own weaknesses and to work towards improving their skill set. These strategies, including the discussions on brain neuroscience and neuroplasticity and having a fixed versus a growth mindset, helped students to understand the science and research that impacts their learning capability. In addition, the discussions in the course on practice and determination, taking academic risks, embracing setbacks, and learning through challenges allowed students to journal and question their past assumptions and to frame their future learning opportunities. The treatment, that also used faculty and peer support and process-oriented feedback, was

transformative for many students in the study. When the students determine their own research topic, they developed autonomy, and the "HELP" conferences and process-oriented feedback sheets helped students build mastery in the content area and encouraged students to actively improve their skill set. The "Power of Yet" video and the discussion on a fixed versus a growth mindset helped students to realize that their mindset plays an important role in how they perceive their own identity as learners. As noted by Svinicki (2016), it is imperative that instructors create an environment that allows students to feel that they can be successful.

A properly planned growth mindset intervention encourages students to develop autonomy and increase their mastery of skills or competence in the academic area. Students also have relatedness that is provided by developing campus connections. Additionally, Ng (2018) suggests that growth mindset can have possible effects on the neuroscience and development of intrinsic motivation. When faculty members use social psychological interventions, they can increase students' intrinsic motivation to learn and deepen their understanding of academic material (Gehlbach, 2010). Growth mindset interventions increase student satisfaction, but these types of interventions have also been proven to increase student academic performance for several years after the intervention was conducted (Yeager & Walton, 2011).

The research shows that a social-psychological intervention, such as growth mindset, not only helps to increase student performance, but an intervention, even an intervention over a short time period, can have a profound impact on students' grades and academic growth (Wilson & Linville, 1985). At Midwest University, students reported post treatment that they now had the confidence to feel like they belonged in college, which can oftentimes be an issue for inexperienced and first-generation students (Cox, 2009a). The overall goal of the growth mindset treatment was to enable students to push through their fears, gain confidence, and learn to

improve and enjoy the writing process. Some of the key findings in the study related to how the impact study helped to increase this type of student confidence, improved student writing skills, and increased the students' enjoyment level of the writing process. Many students in the treatment group, despite entering the course feeling very intimidated, left the course feeling satisfied with their Composition I experience. Interestingly, student satisfaction is one of the areas that has been closely studied in retention research, and it is noted that a student is more likely to complete their education when they have developed campus connectivity (Tinto, 1975, 1987); a growth mindset treatment in a gateway course can help students feel that they have campus connectivity, which leads to overall satisfaction with their academic experience.

In sum, after analyzing the data, and considering the limitations of the study, it is believed that the strategies used in this impact study facilitated students in developing a growth mindset. When examining the treatment group data, there was an increase in the intelligence domain that was significant, and the qualitative data did note that students had increased their enjoyment and confidence level in regards to their writing. There was also a clear improvement in the exit assessment scores when comparing the treatment group with the control group. With those points in mind, the data shows that using a growth mindset treatment in a gateway composition course improved student writing confidence and increased the exit assessment scores of content knowledge. The impact study also examined if growth mindset had a greater effect on first generation students, low socioeconomic students, and students of color. In theory, it was believed that a growth mindset treatment would allow these students to have a better chance at course completion, academic success, and long-term degree persistence, thus increasing overall university retention. Most participants in the treatment entered college as first-time students, and most students reported feeling nervous and insecure about their writing

abilities, but after the treatment, students reported that they had gained confidence in their academic skills. This level of increased confidence is the true impact that growth mindset can have in a gateway course, especially a course comprised of a high percentage of underprepared students.

Implications for Policy and Practice

The empirical evidence suggests that universities can become instrumental in increasing student academic success and overall student persistence, which should be incorporated as standard practice. However, there is little prior research on implementing growth mindset in writing courses, which is increasingly an important retention effort for student academic success and persistence. Ultimately, the goal of universities is to increase matriculation, and teaching students to have a growth mindset can potentially increase student graduation rates, so the implications of this research demonstrate the necessity of adding growth mindset to all writing gateway courses. It is true that growth mindset strategies have been used in university gateway courses in the past, but by also incorporating these strategies into a gateway writing course, professors can further enable their students to develop a positive mindset and encourage habits that lead to student success. Universities have a social responsibility to their stakeholders (Milena & Stancu, & Diaconu, 2010) and even though retention strategies have a cost association, adopting a comprehensive growth mindset treatment in all gateway courses can increase student success and persistence.

Many universities have adopted the implementation of collaborative learning cohorts in math gateway courses (Wang, Eccles, & Kenny, 2013). These types of cohorts are also often established within the major fields of degree seeking students or in student orientation cohorts, but it is also a good practice to establish cohorts that are comprised of gateway writing students.

This practice, of establishing gateway writing cohorts, will lend itself to implementing more robust growth mindset interventions. Gateway writing cohorts will also help students further stablish campus connectivity. These types of gateway courses, where students are taught to focus foremost on deeper learning, and less on performance, will create positive academic climates for students (Leslie, Cimpian, Meyer, & Freeland, 2015; Meece, Anderman, & Anderman, 2006; Meyer, Cimpian, & Leslie, 2015).

Growth mindset interventions are primarily focused on helping students develop autonomy and have an increased motivation to learn, but when policy makers create an intervention, it is necessary to be mindful of student populations who are considered underrepresented or underprepared because many times these students have other external factors, such as socioeconomic status, lack of familial support, or other cultural constraints that can be a hindrance in developing a growth mindset, and it can be surmised that university administrators and professors need to incorporate additional growth mindset strategies and other effective interventions because these retention efforts are still needed to increase the success rate of underrepresented student populations.

Limitations

When considering the findings of this study, it is important to recognize the limitations associated with this study and how these implications might affect future research. The most significant limitation of this impact study was that the sample size was relatively small, especially for the control group, so the statistical analysis did not always have the needed power to show significant results. Another clear limitation of the study was that it was not possible to collect qualitative data for the control group. Because the qualitative data for this impact study was collected as part of the growth mindset treatment, only treatment participants submitted

qualitative data. The researcher had no input on the course content or requirements for the control group, and thus, it was not feasible to obtain this type of qualitative data. Another possible limitation was that even though students were independently allowed to enroll in composition courses, there is the consideration that the student population in the treatment group entered the course with a naturally greater capacity to develop growth mindset. It is also noted that the findings of the impact study are representative of a course that was developed and taught by the same instructor, thus the conclusions must be used as consideration for future studies that actively examine additional growth mindset strategies that can be implemented across multiple writing gateway courses.

In addition, some research has shown that growth mindset is more impactful for students who already have strong academic ability and that students who are the weakest academically do not show improvement when exposed to a growth mindset treatment (Chao et al., 2017). Another factor to consider is that some researchers believe that growth mindset can be damaging to a student's self-efficacy, especially when students are encouraged to work harder, but they, in turn, see very little improvement in their skills. Meta-analysis conducted by researchers at Michigan State University and Case Western Reserve University (2018) found that growth mindset had little effect on academic performance. However, Sisk, Burgoyne, Sun, Butler, and Macnamara (2018) did cautiously report that growth mindset seemed to be more impactful for both economically disadvantaged students and students who were academically at risk. Additionally, Mills and Mills (2018) found that growth mindset did show a correlation between mindset and academic performance, but growth mindset did not impact long-term student retention.

It is true that there are few studies on using growth mindset in a gateway composition course, so there is very little empirical evidence to support that growth mindset is beneficial in

this type of setting. However, the theoretical framework for this impact study was designed using an in-depth review of literature, and the intervention was designed to accurately incorporate Dweck's growth mindset strategies. The data set in this study was collected from a regional university that is located in the Midwest United States. The student population consisted of a high number of students who were first generation college students and who come from a low socioeconomic background. When considering the results of this study, it is important to consider that not all student populations might be impacted by a growth mindset intervention in the same way due to student demographics, cultural experiences, and geographical bias. In this geographic region, students are generally underprepared academically due to socioeconomic status. Students are also at a disadvantage because state lawmakers have continued to defund public education, which has created critical teacher shortages and a high teacher turnover rate. In addition, Oklahoma adopted curriculum that focused on meeting the demands of state mandated testing but that did not necessarily teach the skills that were needed for college readiness.

S**uggestions for Future Research**

The empirical literature on student retention primarily focuses on traditional four-year universities. Midwest University is mainly a commuter campus. There have been very few studies that focus on student retention issues for commuter four-year institutions (Bean & Metzner, 1985). Evaluating the impact of a growth mindset interventions on commuter campuses and non-traditional campuses is much needed research. It is also unclear if this impact study would have the same results if it was implemented elsewhere, based on the student demographics and the geographic location of the university, but this study could be replicated with additional student populations, in different regions of the country, and in varying types of universities. Such a replication would help establish the correlation in the data between growth mindset and an

increase in student academic performance. Replications of the study would provide beneficial data, especially if the studies were to use differing population groups and were conducted at varying types of universities in different regions.

The concept of using growth mindset in a gateway writing course has not been thoroughly studied like the growth mindset math and student orientation interventions. Any additional literature on using growth mindset in writing courses at the university level will be welcome contributions to the field of research. Also, it is suggested that future impact studies include multiple course sections, for both treatment and control groups, so that the samples can be more clearly analyzed for statistical power, and with a systematic university approach, qualitative data can be collected from both the control and treatment student groups, which will create a richer, more meaningful impact evaluation. It is believed that further research on using growth mindset in university gateway writing courses is needed because growth mindset can be a powerful retention strategy. Growth mindset allows students to increase their confidence level, which leads to intrinsic motivation; it is this type of mindset that will allow more students to be academically successful and persist towards completing a college degree, which for many students is a life changing accomplishment.

References

ACT. (2011). The condition of college and career readiness. Iowa City, IA: Author.

Aditomo, A. (2015). Students' response to academic setback: "Growth mindset" as a buffer against demotivation. *International Journal of Educational Psychology*, *4*(2), 198-222. doi: 10.17583/ijep.2015.1482

Allen, D. K. (2003). Organizational climate and strategic change in higher education: Organizational insecurity. *Higher Education*, 46, 61-92.

Amenkienan, C.A., & Kogan, L.R. (2004). Engineering students' perceptions of academic activities and support services: Factors that influence their academic performance. *College Student Journal*, *38*, 523-540.

Anderburg (2018). Is college for everyone? An introduction and timeline of college in America. *College, Money & Career*, Retrieved from https://www.artofmanliness.com/articles/is-college-for-everyone-an-introduction-and-timeline-of-college-in-america/

Antonio, A., Chang, M., Hakuta, K., Kenny, D., Levin, S. & Milem, J. (2004). Effects of racial diversity on complex thinking in college students. *Psychological Science*, *15*(8), 507-510.

Aronson, E. (1999). The power of self-persuasion. *American Psychologist*, 54(11), 875-884.

Aronson, J., Cohen, G., & McColskey, W. (2009). *Reducing stereotype threat in classrooms: A review of social-psychological interventions studies on improving the achievement of Black students*. Washington, DC: National Center for Educational Evaluation and Regional Assistance, Institute for Education Science, U.S. Department of Education.

Aronson, J., Fried, C., & Good, C. (2002). Reducing the effects of stereotype threat on African American college students by shaping theories of intelligence. *Journal of Experimental Social Psychology*, *38*(2), 113-125. doi:10.1006/jesp.2001.1491

Arum, R., & Roksa, J. (2011). *Academically adrift: Limited learning on college campuses*. Chicago, IL: University of Chicago Press.

Associated Press. (2014). University of Missouri system starts alert program. *AP Regional State Report - Missouri*. Retrieved from http://www.columbiatribune.com

Astin, A. W. (1977). *Four critical years: Effects of college on beliefs, attitudes, and knowledge*. San Francisco: Jossey-Bass.

Astin, A. W. (1993a). What matters in college. *Liberal Education, 79*(4), 4-15.

Astin, A. W. (1993b). *What matters in college? Four critical years revisited* (1st ed.). San Francisco: Jossey-Bass.

Astin, A. W. (1997). How "good" is your institution's retention rate? *Research in Higher Education, 38*(6), 647-658.

Ayers, D. F. (2009). Institutional contradiction in the community college. *Community College Review,* 37(2), 165-184. doi: 10.1177/0091552109348042

Bai, H. & Pan, W. (2009). A multilevel approach to assessing the interaction effects on college student retention. *Journal of College Student Retention: Research, Theory & Practice, 11*(2), 287-301.

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

Bandura, A. (1997). *Self-efficacy: The exercise of control*. New York: W. H. Freeman and Company.

Bean, J. & Eaton, S. B. (2000). A psychological model of college student retention. In J.M. Braxton (Ed.), Reworking the departure puzzle: New theory and research on college student retention. Nashville: University of Vanderbilt Press.

Bean, J., & Metzner, B. (1985). A conceptual model of non-traditional undergraduate student attrition. *Review of Educational Research*, 55(4), 485-540. http://dx.doi.org/10.3102/00346543055004485

Berger, J. B., & Lyon, S. C. (2005). Past to present: A historical look at retention. In A. Seidman (Ed.), College student retention: Formula for student success (pp. 1-30). Westport, CT: Praeger Publishers.

Bess, J. L, & Dee, J. R. (2014). *Bridging the divide between faculty and administration: A guide to understanding conflict in the academy*. New York, Routledge.

Bickerstaff, S., Barragan, M., & Rucks-Ahidiana. (2012). "I came in unsure of everything": Community college students' shifts in confidence (CCRC Working Paper No. 48). New York, NY: Columbia University, Teachers College, Community College Research Center.

Blackwell, L., Trzesniewski, K. H., & Dweck, C. S. (2007). Implicit theories of intelligence predict achievement across an adolescent transition: A longitudinal study and an intervention. *Child Development*, *78*(1), 246-263. doi: 10.1111/j.1467-8624.2007.00995.x

Blue, J., Johnson, B., Summerville, A., & Kirkmeyer, B. (2018). Beliefs and behaviors of first-generation and low-income students in early engineering courses. *CoNECD - The Collaborative Network for Engineering and Computing Diversity Conference*: Crystal City, Virginia. Retrieved from file:///C:/Users/beairds/Downloads/beliefs-and-behaviors-of-first-generation-and-low-income-students-in-early-engineering-courses.pdf

Boggs, G. R., & McPhail, C. J. (2016). *Practical leadership in community colleges: Navigating today's challenges*. Hoboken, NJ: John Wiley & Sons, Inc.

Bong, M. (2001). Role of self-efficacy and task-value in predicting college students' course performance and future enrollment intentions. *Contemporary Educational Psychology,* 26, 553–570.

Boylan, H.R. (2009). Targeted intervention for development education students (T.I.D.E.S.) *Journal of Developmental Education*, *32*(3), 14-23.

Bowen, W., Chingos, M., & McPherson, M. (2009). *Crossing the finish line: Completing college at America's public universities*. Princeton, NJ: Princeton, University Press.

Bowman-Perott, L., Davis, H., Vannest, K., Williams, L., Greenwood, C., & Parker, R. (2013). Academic benefits of peer tutoring: A meta-analytic review of single-case research. *School Psychology Review*, *42*(1), 39-55.

Broda, M., Yun, J., Schneider, B., Yeager, D., Walton, G., & Diemer, M. (2018). Reducing inequality in academic success for incoming college students: A randomized trial of growth mindset and belonging interventions. *Journal of Research on Educational Effectiveness*, 11(3), 317-338. Retrieved from https://doi.org/10.1080/19345747.2018.1429037

Brooks, R., & Goldstein, S. (2008). The mindset of teachers capable of fostering resilience in students, *Canadian Journal of School Psychology*, *23*(1), 114-126. doi:10.1177/0829573508316597

Brooks-Gunn J., & Duncan G.J. (1997). The effects of poverty on children. *Future Child*, *7*(2), 55–71.

Brougham, L., & Kashubeck-West, S. (2017). Impact of a growth mindset intervention on academic performance of students at two urban high schools. *Professional School Counseling*. Retrieved from https://doi.org/10.1177/2156759X18764934

Brown, T., Palmer, J., Bryant, M., & Vieth, W. (26 May 2017). Winners and losers in the battle over the budget. *Oklahoma Watch*. Retrieved from oklahomawatch.org/2017/05/26/winners-and-losers-in-the-states-6-8-billion-budget/

Budig, J., Koenig, A., & Weaver, T. (1991). Postcards for student success. *Innovation Abstracts*, *12*(28), 4.

Byrd, K. L., & MacDonald, G. (2005). Defining college readiness from the inside out: First-generation college student perspectives. *Community College Review*, *33*(1), 22-30.

Calderone, J. (2014). 10 big ideas in 10 years of brain science: Scientific American mind reflects on the major discoveries of the past decade that have transformed how we think about the brain. *Scientific American*. Retrieved from https://www.scientificamerican.com/article/10-big-ideas-in-10-years-of-brain-science/

Caraway, K., Tucker, C. M., Reinke, W. M., & Hall, C. (2003). Self-efficacy, goal orientation, and fear of failure as predictors of school engagement in high school students. *Psychology in the Schools*, 40, 417–427.

Carnevale, A., Smith, N., & Strohl, J. (2010). Help wanted: Projections of jobs and education requirements through 2018. Washington, DC: Association of American Colleges and Universities.

Center for Community College Student Engagement. (2019). A mind at work: Maximizing the relationship between mindset and student success, *2019 NATIONAL REPORT*. Retrieved from https://www.ccsse.org/NR2019/Mindset.pdf

Chao, M.M., Visaria, S., Dehejia, R., & Mukhopadhyay, A. (2017). Do rewards reinforce the growth mindset? Joint effects of the growth mindset and incentive schemes in a field intervention. *Journal of Experimental Psychology: General*, 146(10), 1402-1419.

Chemers, M. M., Hu, L., & Garcia, B. F. (2001). Academic self-efficacy and first year college student performance and adjustment. *Journal of Educational Psychology*, 93, 55–64.

Cimpian, A., Arce, H., Markman, E. M., & Dweck, C. S. (2007). Subtle linguistic cues impact children's motivation. *Psychological Science, 18*, 314–316.

Clark, L. (2012). When nontraditional is traditional: A faculty dialogue with graduating community college students about persistence. *Community College Journal of Research and Practice, 36*(7), 511-519.

Claro, S., Paunesku, D. & Dweck, C. (2016). Growth Mindset tempers effects of poverty on achievement. *Proceedings of the National Academy of Sciences*, *113*(31), 8664-8668. doi: 10.1073/pnas.1608207113

Cohen, G. & Garcia, J. (2008). Identity, belonging and achievement: A model, interventions, implications. *Current Directions in Psychological Science*, *17*(6), 365-369. doi:10.1111/j.1467-8721.2008.00607.x

Cohen, G. L., Garcia, J., Apfel, N., & Master, A. (2006). Reducing the racial achievement gap: A social-psychological intervention. *Science*, 313, 1307-1310.

Cohen, G. L., Garcia, J., Purdie-Vaugns, V., Apfel, N., & Brzustoski, P. (2009). Recursive processes in self-affirmation: Intervening to close the minority achievement gap. *Science*, 324, 400-403.

Cohen, G., Steele, C., & Ross, L. (1999). The mentor's dilemma: Providing critical feedback across the racial divide. *Personality and Social Psychology Bulletin, 25*(10), 1302-1318.

Cohen, M. D., & March, J. G. (1974). Leadership and ambiguity: The American college president. Boston: Harvard Business School Press.

Coley, C., Coley, T., & Lynch-Holmes, K. (2016). Retention and student success: Implementing strategies that make a difference. Retrieved from https://www.ellucian.com/White-Papers/Retention-and-student-success/

Cox, R. (2009a). *The college fear factor: How students and professors misunderstand one another*. Cambridge, MA: Harvard University Press.

Cox, R. (2009b). It was just that I was afraid: Promoting success by addressing students' fear of failure. *Community College Review*, *37*(1), 52-80. doi:10.1177/0091552109338390

Cury, F., Elliot, J., Da Fonseca, D., & Moller, A. (2006). The social-cognitive model of achievement motivation and the 2x2 achievement goal framework. *Journal of Personality and Social Psychology*, 90(4), 666-679.

Dar-Nimrod, I., & Heine, S. J. (2006). Exposure to scientific theories affects women's math performance. *Science*, *314*, 435. doi:10.1126/science.1131100

Davidson, C. (2015). Precollege factors and leading indicators: Increasing transfer and degree completion in a community and technical college system. *Community College Journal of Research and Practice*, *39*(11), 1007-1021.

Deci, E. L., Vallerand, R. J., Pelletier, L. G., & Ryan, R. M. (1991). Motivation and education: The self-determination perspective. Educational Psychologist, 26(3 & 4), 325-346.

Degol, J. L., Wang, M., Zhang, Y. (2017). Do growth mindsets in math benefit females? Identifying pathways between gender, mindset, and motivation. *Journal of Youth and Adolescence*, 47, 976–990. Retrieved from https://doi.org/10.1007/s10964-017-0739-8

Derby, D. (2007). Predicting degree completion: Examining the interaction between orientation course participation and ethnic background. *Community College Journal of Research and Practice*, *31*(11), 883-894.

Derby, D. & Smith, T. (2004). An orientation course and community college retention. *Community College Journal of Research and Practice*, *28*(9), 763-773.

Derby, D. & Watson, L. (2006). African-American retention within a community college: Differences in orientation course enrollment. *Journal of College Student Retention: Research, Theory & Practice*, *8*(3), 377-390.

DeWitz, S., Woolsey, M.L., & Walsh, W. (2009). College Student Retention: An Exploration of the Relationship Between Self-Efficacy Beliefs and Purpose in Life Among College Students. *Journal of College Student Development*, 50, 19-34.

Doidge, N. (2007). *The brain that changes itself: Stories of personal triumph from the frontiers of brain science*. New York, NY: Viking.

Dollinger, S. J., Matyja, A. M., & Huber, J. L. (2008). Which factors best account for academic success: Those which college students can control or those they cannot? *Journal of Research in Personality*, *42*, 872-885.

Dupeyrat, C. & Mariné, C. (2005). Implicit theories of intelligence, goal orientation, cognitive engagement, and achievement: A test of Dweck's model with returning to school adults. *Contemporary Educational Psychology*, 30, 43-59. doi:10.1016/j.cedpsych.2004.01.007

Dweck, C. S. (1986). Motivational processes affecting learning. *American Psychologist*, *41*(10), 1040-1048. doi: 10.1037/0003- 066X.41.10.1040

Dweck, C. (1999). *Self-theories: Their role in motivation, personality, and development*. New York, NY: Psychology Press

Dweck, C. (2006). *Mindset: The new psychology of success*. New York, NY: Ballantine Books.

Dweck, C. (2007). Boosting achievement with messages that motivate. *Education Canada*, *47*(2), 6-10.

Dweck, C. S. (2008a). Brainology transforming students' motivation to learn. *Independent School*, *67*(2), 110-119.

Dweck, C. (2008b). *Mindsets and math/science achievement*. Princeton, NJ: Carnegie Corporation. Retrieved from http:// dev.opeq.blenderbox.com/uploads/files/ 868cea31-5888-4e45-a832- 62b4377dbbfb.pdf

Dweck, C. (2009). Can we make our students smarter? *Education Canada*, 49(4), 56-61. Retrieved from https://www.edcan.ca/wp-content/uploads/EdCan-2009-v49-n4-Dweck.pdf

Dweck, C. S. (2010a). Even geniuses work hard. *Educational Leadership*, *68*(1), 16.

Dweck, C. (2010b). Mind-sets and equitable education. *Principal Leadership*, *10*(5), 26- 29.

Dweck, C. S., Chiu, C. & Hong, Y. (1995). Implicit theories and their role in judgments and reactions: A world from two perspectives. *Psychological Inquiry*, *6*(4), 267-285. doi: 10.1207/s15327965pli0604_1

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

Dweck, C. S., Mangels, J. A., & Good, C. (2006). *Motivational effects on attention, cognition, and performance.* Mahwah, NJ: Lawrence Erlbaum Associates.

Dweck, C., Walton, G., & Cohen, G. (2014). Academic tenacity: Mindsets and skills that promote long-term learning. Paper prepared for the Gates Foundation. Seattle, WA.

Eccles, J. S. (2005). Studying the development of learning and task motivation. *Learning and Instruction*, 15(2), 161– 171.

Eccles, J., & Wigfield, A. (2002). Motivational beliefs, values, and goals. *Annual Review of Psychology*, 53, 109–132.

Edwards, A. R., & Beattie, R. L. (2016). Promoting student learning and productive persistence in developmental mathematics: Research frameworks informing the Carnegie Pathways. *NADE Digest, 9*(1), 30–39.

Elliot, A. J. (1999). Approach and avoidance motivation and achievement goals. *Educational Psychologist*, 34, 169–189.

Endo, J. & Harpel, R. (1982). The effect of student-faculty interaction on students' educational outcomes. *Research in Higher Education, 16*(2).

Ericsson, K. A., Charness, N., Feltovich, P. J., & Hoffman, R. R. (Eds.). (2006). *The Cambridge handbook of expertise and expert performance.* New York: Cambridge University Press.

Esterberg, K. G., & Wooding, J. (2012). *Divided conversations: Identities, leadership, and change in public higher education*. Nashville: Vanderbilt University Press.

Evans G. W., & Schamberg, M. A. (2009). Childhood poverty, chronic stress, and adult working memory. *Proc Natl Acad Sci USA, 106*(16) 6545–6549.

Farrington, C., Roderick, M., Allensworth, E., Nagaoka, J, Keyes, T.S., Johnson, D., & Beechum, N. (2012). *Teaching adolescents to become learners. The role of noncognitive factors in shaping school performance: A critical literature review*. Chicago: University of Chicago Consortium on Chicago School Research.

Fike, D. & Fike, R. (2007). Does faculty employment status impact developmental mathematics outcomes? *Journal of Developmental Education, 31*(1), 2-11.

Fike, D. & Fike, R. (2008). Predictors of first-year student retention in the community college. *Community College Review, 36*(2), 68-88.

Gansemer-Topf, A. M., & Schuh, J. H. (2006). Institutional selectivity and institutional expenditures: Examining organizational factors that contribute to retention and

graduation. *Research in Higher Education, 47*(6), 613–642. Retrieved from https://doi-org.rsulibproxy.rsu.edu/10.1007/s11162-006-9009-4

Garcia, M. (2010). When Hispanic students attempt to succeed in college, but do not. *Community College Journal of Research and Practice*. *34*(10), 839-847.

Gehlbach, H. (2010). The social side of school: Why teachers need social psychology. *Educational Psychology Review 22*. (3), 349-362.

Geltner, P. (2001). *The characteristics of early alert students*. Santa Monica, CA: Santa Monica College.

Good C., Aronson J., & Harder J.A. (2008). Problems in the pipeline: Stereotype threat and women's achievement in high-level math courses. *Journal of Applied Developmental Psychology*, 29(1), 17-28.

Good, C., Aronson, J., & Inzlicht, M. (2003). Improving adolescents' standardized test performance: An intervention to reduce the effects of stereotype threat. *Applied Developmental Psychology,* 24(6), 645-662. doi:10.1016/j.appdev.2003.09.002

Good, C., Rattan, A., & Dweck, C. (2007). Adults' theories of intelligence affects feedback to males and females in math. Unpublished data, Columbia University.

Gore, P. A. (2006). Academic self-efficacy as a predictor of college outcomes: Two incremental validity studies. *Journal of Career Assessment*, 14, 92–115.

Grant-Halvorson, H. (2010). *Succeed: How we can reach our goals*. New York, NY: Hudson Street Press.

Grant, H., & Dweck, C. S. (2003). Clarifying achievement goals and their impact. *Journal of Personality and Social Psychology, 85*, 541–553.

Green, M. G. (1989). *Minorities on campus: A handbook for enhancing diversity*.

Washington, D.C.: American Council on Education.

Grillo, M. C., & Leist, C. W. (2013). Academic support as a predictor of retention to graduation: new insights on the role of tutoring, learning assistance, and supplemental instruction. *Journal of College Student Retention: Research, Theory & Practice, 15*(3), 387–408. Retrieved from https://doi.org/10.2190/CS.15.3.e

Hagel, J. III & Brown S. (2010). Do you have a growth mindset? *Harvard Business Review,* Retrieved from https://hbr.org/2010/11/do-you-have-a-growth-mindset

Haimovitz, K., & Dweck, C. S. (2016). What predicts children's fixed and growth intelligence mind-sets? Not their parents' views of intelligence but their parents' views of failure. *Psychological Science*, *27*, 1043–1046.

Haimovitz, K., Wormington, S., & Corpus, J. (2011). Dangerous mindsets: How beliefs about intelligence predict motivational change. *Learning and Individual Differences*, *21*(6), 747-752. doi:10.1016/j.lindif.2011.09.002

Hattie, J. (2009). *Visible learning: A synthesis of over 800 meta-analyses relating to achievement*. New York, NY: Routledge.

Hawley, T. & Harris, T. (2005) Student characteristics related to persistence for first-year community college students. *Journal of College Student Retention: Research, Theory & Practice*, *7*(1), 117-142.

Hemsley-Brown, J., & Oplatka, I. (2006). Universities in a competitive global marketplace. *International Journal of Public Sector Management*, *79*(4), 316-33.

Hetzel, C., Laskey, M., & Hardt-Schultz, R. (2014). The nuances of tutoring and academic performance of undergraduate students. Retrieved from https://eric.ed.gov/?id=ED546483

Higgins, B. (2004). Relationship between retention and peer tutoring for at-risk students. *Journal of Nursing Education*, *43*, 319-321.

Hirsh, S., & Killion, J. (2009). When educators learn, students learn: Eight principles of professional learning. *Phi Delta Kappan*, 90(7), 464-469.

Hochanadel, A. & Finamore, D. (2015). Fixed and growth mindset in education and how grit helps students persist in the face of adversity. *Journal of International Education Research*, 11(1), 47-50.

Hodges, R. (2001). Encouraging high-risk student participation in tutoring and supplemental instruction. *Journal of Developmental Education*, *24*(3), 2-8.

Holmes, N. (2006). Growth mindset diagram. Retrieved from http:// www.isacs.org/misc_files/Mindset%20diagram.pdf

Hong, Y.-y., Chiu, C.-y., Dweck, C. S., Lin, D. M. S., & Wan, W. (1999). Implicit theories, attributions, and coping: A meaning systems approach. *Journal of Personality and Social Psychology*, *77*(3), 588- 599. doi: 10.1037/0022-3514.77.3.588

Hurtado, S., Milem, J., Clayton-Pederson, A., & Allen, W. (1999). Enacting diverse learning environments: Improving the climate for racial/ethnic diversity in higher education. *ASHE-ERIC Higher Education Report*, *26*(8).

Hyers, A. D., & Joslin, M. N. (1998). The first-year seminar as a predictor of academic achievement and persistence. *Journal of The Freshman Year Experience & Students in Transition*, *10*(1), 7-30.

Jamieson, J., Mendes, W., Blackstock, E., & Schmader, T. (2010). Turning the knots in your stomach into bows: Reappraising arousal improves performance on the GRE. *Journal of Experimental Social Psychology*, 46, 208-212. doi:10.1016/j.jesp.2009.08.015

Jayaprakash, S., Moody, E., Lauría, E., Regan, J. and Baron, J. (2014). Early Alert of Academically At-Risk Students: An Open Source Analytics Initiative. *Journal of Learning Analytics,* 1(1), 6–47

Kadar, R. S. (2001). A counseling liaison model of academic advising. Journal of College Counseling, 4(2), 174-78.

Kamins, M. L., & Dweck, C. S. (1999). Person versus process praise and criticism: Implications for contingent self-worth and coping. *Developmental Psychology*, *35*(3), 835-847. Retrieved from http://dx.doi.org/10.1037/0012-1649.35.3.835

Karman, F. J. (1973, April). *Women: personal and environmental factors in career choice*. Paper presented at the meeting of the American Educational Research Association, New Orleans, LA.

Kasriel, S. (2018). The future of work won't be about college degrees, it will be about job skills. *CNBC*. Retrieved from https://www.cnbc.com/2018/10/31/the-future-of-work-wont-be-about-degrees-it-will-be-about-skills.html

Keels, C. L. (2004). Keeping students afloat: Noel-Levitz awards recognize retention programs that generate results. *Black Issues in Higher Education*, 21(18), 32.

Kerby, M. (2015). Toward a new predictive model of student retention in higher education: An application of classical sociological theory. *Journal of College Student Retention: Research, Theory & Practice, 17*(2). Retrieved from journals.sagepub.com.ezproxy.lib.ou.edu/doi/full/10.1177/1521025115578229

Kezar, A. J. (2014). *How colleges change: Understanding, leading, and enacting change*. New York: Routledge.

Kezar, A. J., & Eckel, P. D. (2002). The effect of institutional culture on change strategies in higher education: Universal principles or culturally responsive concepts? *The Journal of Higher Education*, 73(4), 435-460. doi: 10.1353/jhe.2002.0038

Komarovsky, M. (1985). *Women in college: Shaping new feminine identities*. New York: Basic Books.

Kornilova, T., Kornilova, S., & Chumakova, M. (2009). Subjective evaluations of intelligence and academic self-concept predict academic achievement: Evidence from a selective student population. *Learning and Individual Differences*, 19(4), 596-608. doi:10.1016/j.lindif.2009.08.001

Korstange, R. (2016). Developing growth mindset through reflective writing. *Journal of Student Success and Retention*, *3*(1).

Kowalski, T. (2011) *Public relations in schools*. (5th ed.). Upper Saddle River, NJ: Pearson Education Inc.

Kuh, G. D. (2005). *Student engagement in the first year of college. In challenging and supporting the first-year student: A handbook for improving the first year of college*, M. L. Upcraft, J. N. Gardner, and B. O. Barefoot (Eds.). 86-107. San Francisco: Jossey-Bass.

Kuh, G., Kinzie, J., Buckley, J., Bridges, B., Hayek, J. (2006). What matters to student success: A review of the literature. Retrieved from https://nces.ed.gov/npec/pdf/kuh_team_report.pdf

Kuh, G., Kinzie, J., Buckley, J., Bridges, B., Hayek, J. (2007). Piecing together the student success puzzle: research, propositions, and recommendations. Hoboken, NJ: Wiley Periodicals, Inc.

Kuh, G. D., Kinzie, J., Schuh, J. H., and Whitt, E. J. (2005b). *Student success in college: creating conditions that matter.* San Francisco: Jossey-Bass.

Lane, J., & Lane, A. (2001). Self-efficacy and academic performance. *Social Behavior and Personality*, 29, 687–694.

Laskey, M. L. (2004). Assessing the influence of self-efficacy, metacognition, and personality traits on at-risk college students' academic performance and persistence (Doctoral Dissertation). Retrieved from Pro Quest. (ATT3151957)

Layzell, D. (1992). Doing more with less: The "new" realities of higher education finance. *The Review of Higher Education, 15*(2), 233-244.

Lederman, D. & Fain, P. (2017). The higher education president. *Inside High Ed*. Retrieved from https://www.insidehighered.com/news/2017/01/19/assessing-president-obamas-far-reaching-impact-higher-education

Lehr, C. A. (2004). Increasing school completion: Learning from research-based practices that work. *National Center on Secondary Education and Transition*, University of Minnesota.

Leslie S. J., Cimpian A., Meyer M., & Freeland E. (2015). Expectations of brilliance underlie gender distributions across academic disciplines. *Science.* 347:262–265. doi: 10.1126/science.1261375.

Levine, A. & Cureton, J. S. (1998). *When hope and fear collide: A portrait of today's college student.* San Francisco: Jossey-Bass.

Levitz, R. (1990). Sizing up retention programs. *Recruitment and Retention in Higher*

Education, 4(9), pp. 4-5.

Levitz, R. (1991). Adding peer tutors to your retention program. *Recruitment and Retention in Higher Education, 5*(10), 5-7.

Liefner, I. (2003). Funding, resource allocation, and performance in higher education systems. *Higher Education, 46*(4), 469-489.

MacKay, K. A. (1991). *Involving colleges: Successful approaches to fostering student learning and development outside the classroom*. San Francisco: Jossey-Bass Publishers.

Maggio, J. C., White Jr., W. G., Molstand, S., & Kher, N. (2005). Prefreshman summer programs' impact on student achievement and retention. *Journal of Developmental Education, 29*(2), 2-33.

Mangels, J., Butterfield, B., Lamb, J., Good, C. & Dweck, C. (2006). Why do beliefs about intelligence influence learning success? A social-cognitive-neuroscience model. *Social, Cognitive, and Affective Neuroscience, 1*(2), 75-86. doi:10.1093/scan/nsl013

Mansfield, M., O'Leary, E., & Webb, S.V. (2011). Retention in higher education: Faculty and student perceptions of retention programs and factors impacting attrition rates. Doctoral Dissertation, Indiana University South Bend. Retrieved from https://eric.ed.gov/?id=ED521416

Matthews, D. (2013). Everything you need to know about Obama's higher ed plan. *The Washington Post*. Retrieved from https://www.washingtonpost.com/news/wonk/wp/2013/08/22/everything-you-need-to-know-about-obamas-higher-ed-plan/?noredirect=on

Mazlow, A. H. (1943). A theory of human motivation. *Psychological Review*, 50, 370-396.

McClenney, K., Marti, C. N., & Adkins, C. (2007). Student engagement and student outcomes: Key findings from CCSSE validation research. Retrieved from http://www.ccsse.org/aboutsurvey/docs/CCSSE%20Validation%20 Summary.pdf

Meece J. L., Anderman E. M., & Anderman L. H. (2006). Classroom goal structure, student motivation, and academic achievement. *Annual Review of Psychology*. 57, 387–503. doi: 10.1146/annurev.psych.56.091103.070258.

Mendoza, P., Horton, D. & Mendez, J. (2012). Retention among community college student-athletes. *Community College Journal of Research and Practice*, *36*(3), 201-219.

Mendoza-Denton, R., Purdie, V., Downey, G., Davis, A., & Pietrzak, J. (2002). Sensitivity to status-based rejection: Implications for African–American students' college experience. *Journal of Personality and Social Psychology*, 83, 896–918.

Mertes, S. (2015). Social integration in a community college environment. *Community College Journal of Research and Practice*, *39*(11), 1052-1064.

Mertes, S. & Hoover, R. (2014). Predictors of first-year retention in a community college. *Community College Journal of Research and Practice*, *38*(7), 651-660.

Meyer M., Cimpian A., & Leslie S.J. (2015). Women are underrepresented in fields where success is believed to require brilliance. *Frontiers in Psychology*. 6,1–12. doi: 10.3389/fpsyg.2015.00235.

Michigan State University. (2018) Study finds popular 'growth mindset' educational interventions aren't very effective." *Science Daily*. Retrieved from www.sciencedaily.com/releases/2018/05/180522114523.htm.

Midgley, C., & Urdan, T. (2001). Academic self-handicapping and achievement goals: A further examination. *Contemporary Educational Psychology*, 26, 61–75.

"Midwest" University, Office of Accountability and Academics. Institutional fact book 2017 edition. (2017).

Mindsetworks. (2017). Retrieved from https://www.mindsetworks.com/science/

Milena, Z, Stancu, A., & Diaconu, M. (2010). University social responsibility and stakeholders' influence. *Transformations in Business and Economics*. 9, 434-447.

Mills, I. M., & Mills, B. S. (2018). Insufficient evidence: mindset intervention in developmental college math. *Social Psychology Education*, 21, 1045–1059. Retrieved from https://doi.org/10.1007/s11218-018-9453-y

Mischel, W., & Shoda, Y. (1995). A cognitive-affective systems theory of personality: Reconceptualizing the invariances in personality and the role of situations. *Psychological Review, 102,* 246-268.

Mitchell C. & Fry, T. (2016) Evidence to support peer tutoring programs at the undergraduate level, *Journal of College Reading and Learning, 46*(1), 16-41. doi: 10.1080/10790195.2015.1075446

Miyake, A., Kost-Smith, L., Finkelstein, N., Pollock, S., Cohen, G., & Ito, A. (2010). Reducing the gender achievement gap in college science: A classroom study of values affirmation. *Science*, 330(6008), 1234-1237. doi: 10.1126/science.1195996

Molden, D. C., & Dweck, C. S. (2006). Finding "meaning" in psychology: A lay theories approach to self-regulation, social perception, and social development. *American Psychologist*, 61, 192-203.

Morisano, D., Hirsh, J., Peterson, J., Pihl, R., & Shore, B. (2010). Setting, elaborating, and reflecting on personal goals improves academic performance. *Journal of Applied Psychology, 95*(2), 255-264. doi:10.1037/a0018478

Mozella, G. (2010) When Hispanic students attempt to succeed in college, but do not. *Community College Journal of Research and Practice*, *34*(10), 839-847.

Mueller, C., & Dweck, C. (1998). Praise for intelligence can undermine children's motivation and performance. *Journal of Personality and Social Psychology*, *75*(1), 33-52.

Multon, K. D., Brown, S. D., & Lent, R. W. (1991). Relation of self-efficacy beliefs to academic outcomes: A meta-analytic investigation. *Journal of Counseling Psychology*, 38, 30–38.

Murphy, L., & Thomas, L. (2008). Dangers of a fixed mindset: Implications of self-theories research for computer science education. *ItiCSE: Proceedings of the 13th Annual Conference on Innovation and Technology in Computer Science Education*, 271-275.

Murphy, S. The Associated Press. (2015). Tax cuts, corporate incentives exacerbate Oklahoma's state budget crisis following oil bust. *Canadian Business*. Retrieved from https://www.canadianbusiness.com/business-news/tax-cuts-corporate-incentives-exacerbate-oklahomas-state-budget-crisis-following-oil-bust/

National Student Clearinghouse: Research Center (2016). Current Term Enrollment Estimates. Retrieved from *https://nscresearchcenter.org/wp-content/uploads/CurrentTerm Enrollment -Spring2016.pdf*

National Survey of Student Engagement (2019). NSSE 2019 OVERVIEW. Center for Postsecondary Research, Indiana University Bloomington School of Education. Retrieved from http://nsse.indiana.edu/html/NSSE_Overview_2019.cfm

Ng, B. (2018). The neuroscience of growth mindset and intrinsic motivation. *Brain Science,* 8(2): 20. Doi: 10.3390/brainsci8020020

Norris, F. (2014). Fewer U.S. graduates opt for college after high school. *The New York Times*. Retrieved from mobile.nytimes.com/2014/04/26/business/fewer-us-high-school-graduates-opt-for-college.html.

Nussbaum, A. D., & Dweck, C. S. (2007). Defensiveness vs. remediation: Self-theories and modes of self-esteem maintenance. *Personality and Social Psychology Bulletin*.

O'Gara, L., Karp, M., & Hughes, K. (2008). Student success courses in the community college: An exploratory study of student perspectives. *Community College Review*, *36*, 195-218. Doi:10.1177/0091352108327186

Ortiz, A. M. (2004). Promoting the success of Latino students: A call to action in addressing the unique needs of Latino American students. *New Directions for Student Services, 105*: 89-97.

Pajares, F., & Johnson, M. J. (1996). Self-efficacy beliefs in the writing of high school students: A path analysis. *Psychology in the Schools*, 33, 163–175.

Pajares, F., & Miller, M. D. (1994). Role of self-efficacy and self-concept beliefs in mathematical problem solving: A path analysis. *Journal of Educational Psychology*, 86, 193–203.

Pascarella, E. T. & Terenzini, P. T. (1977). Patterns of student-faculty informal interaction beyond the classroom and voluntary freshman attrition. *Journal of Higher Education, 48*(5): 540-552.

Pascarella, E. T. & Terenzini, P. T. (1979a). Interaction effects in Spady's and Tinto's conceptual models of college dropout. *Sociology of Education, 52*(4), 197-210.

Pascarella, E. T. & Terenzini, P. T. (1979b). Student-faculty informal contact and college persistence: A further investigation. *Journal of Educational Research, 72*(4), 214-218.

Pascarella, E.T., & Terenzini, P.T. (1983). Predicting freshman year persistence/withdrawal behavior in a residential university: A path analytic validation of Tinto's model. *Journal of Educational Psychology*, *75*(2), 215-226.

Pascarella, E. T. & Terenzini, P. T. (1991). *How college affects students: Findings and insights from twenty-years of research* (1st ed.). San Francisco: Jossey-Bass Publishers.

Pascarella, E. T., & Terenzini, P. T. (2005). How college affects students: A third decade of research (Vol. 2). San Francisco: Jossey-Bass.

Paunesku, D., Walton, G. M., Romero, C. L., Smith, E. N., Yeager, D. S., & Dweck, C. S. (2015). Mindset interventions are a scalable treatment for academic underachievement. *Psychological Science*, 26(6), 784-793.

Peck, J., Chivers, L., & Lincoln, Y. (2010). Learning support: Student perceptions and preferences. *Art Design and Communication in Higher Education*, *9*(2), 135-149.

Pengfei, J. & Maloney, T. (2015). "Using predictive modelling to identify students at risk of poor university outcomes." *Higher Education, 70*(1), 127-149. Retrieved from //link-springer-com.ezproxy.lib.ou.edu/article/10.1007/s10734-014-9829-7

PERTS. (2017). Growth Mindset for College Students: An evidence-based program to raise retention and equity, Retrieved from https://neptune.perts.net/static/programs/cg17/information_packet.pdf

Pintrich, P. R., & De Groot, E. (1990). Motivational and self-regulated learning components of classroom academic performance. *Journal of Educational Psychology*, 82, 33–40.

Potts, G., & Schultz, B. (2008). The freshman seminar and academic success of at-risk students. *College Student Journal*, *42*, 647-658.

Ramirez, G., & Beilock, S. (2011). Writing about testing worries boosts exam performance in the classroom. *Science, 331*, 211-213. doi:10.1126/science.1199427

Rattan, A., Savani, K., Chugh, D., & Dweck, C. S. (2015). Leveraging Mindsets to Promote Academic Achievement: Policy Recommendations. *Perspectives on Psychological Science,* 10(6), 721–726. Retrieved from https://doi.org/10.1177/1745691615599383

Rattan, A., Savani, K., Naidu, N., & Dweck, C. (2012). Can everyone become highly intelligent? Cultural differences in and societal consequences of beliefs about the universal potential for intelligence. *Journal of Personality and Social Psychology*. doi:10.1037/a0029263

Raymond, L. & Napoli, A. R. (1998). An examination of the impact of a freshman 9 seminar course on student academic outcomes. *Journal of Applied Research in the Community College*, *6*, 27-34.

Reinheimer, D., & McKenzie, K. (2011). The impact of tutoring on the academic success of undeclared students. *Journal of College Reading and Learning*, *41*(2), 22-36.

Rheinheimer, D.C., & Mann, A. (2000). Gender matching, floor effects, and other tutoring outcomes. *Journal of Developmental Education*, *24*, 10-15.

Rhew, E., Piro, J., Goolkasian, P., & Cosentino, P. (2018). The effects of a growth mindset on self-efficacy and motivation, *Cogent Education*, 5(1). doi: 10.1080/2331186X.2018.1492337

Richardson, M., Abraham, C., & Bond, R. (2012). Psychological correlates of university students' academic performance: A systematic review and meta-analysis. *Psychological Bulletin*, *138*(2), 353-387. doi: 10.1037/a0026838

Roderick, M., Nagaoka, J., & Coca, V. (2009). College readiness for all: The challenge for urban high schools. *The Future of Children, 19*(1), 185-210.

Romero, C., Master, A., Paunesku, D., Dweck, C. S., & Gross, J. J. (2014) Academic and emotional functioning in middle school: The role of implicit theories. *Emotion,* 14(2), 227–234.

Rudmann, J., & Irvine Valley Coll., I. C. (1992). An evaluation of several early alert strategies for helping first semester freshmen at the community college and a description of the newly developed early alert retention system (EARS) software, 1-41. Retrieved from https://rsulibproxy.rsu.edu/login?url=http://search.ebscohost.com/login.aspx?direct=true&db=eric&AN=ED349055&site=ehost-live

Ruth, B. & Cavanaugh, M. (2017). SDSU professor challenges concept widely embraced by educators. KPBS. Retrieved from https://www.kpbs.org/news/2017/nov/20/sdsu-professor-challenges-concept-widely-embraced-/

Ryan, R. & Deci, E. (2014). *Self-Determination Theory: Basic Psychological Needs in Motivation, Development, and Wellness* (1st ed.). New York: Guilford Press.

Ryan R.M., Deci E.L. (2008). A self-determination theory approach to psychotherapy: The motivational basis for effective change. *Canadian Psychology,* 49, 186–193.

Salinitri, G. (2005). The effects of formal mentoring on the retention rates for first-year, low achieving students. *Canadian Journal of Education*, 28(4), 853-873.

Sanchez, R. J., Bauer, T. N., & Paronto, M. E. (2006). Peer-mentoring freshmen: Implications for satisfaction, commitment, and retention to graduation. *Academy of Management Learning & Education*, *5*(1), 25-37.

Santee, J., & Gakavalia, L. (2006). Peer tutoring programs in health professional schools. *American Journal of Pharmaceutical Education, 70*(3), 1-10.

Saunders, D. (2007). The impact of neoliberalism on college students. *Journal of College and Character*, *8*(5), doi: 10.2202/1940-1639.1620

Saxon, D. P., Sullivan, M., Boylan, H, & Forrest, D. (2005). Developmental education facts, figures, and resources. *Research in Developmental Education*, *19*(4), 1-4.

Schunk, D. H. (1982). Effects of effort attributional feedback on children's perceived self-efficacy and achievement. *Journal of Educational Psychology*, 74, 548–556.

Schunk, D. H. (1989). Self-efficacy and achievement behaviors. *Educational Psychology Review*, 1, 173–208.

Silva, E., & White, T. (2013). *Pathways to improvement: Using psychological strategies to help college students master developmental math.* Stanford, CA: Carnegie Foundation for the Advancement of Teaching. Retrieved from http://files.eric.ed.gov/fulltext/ED560149.pdf

Sisk, V., Burgoyne, A., Sun, J., Butler, J., Macnamara, B. (2018). To what extent and under which circumstances are growth mind-sets important to academic achievement? Two meta-analyses. *Psychological Science*, 29(4), 549. doi: 10.1177/0956797617739704

Skipper, Y., & Douglas, K. (2012). Is no praise good praise? Effects of positive feedback on children's and university students' responses to subsequent failures. *British Journal of Educational Psychology*, *82*(2), 327-339. doi:10.1111/j.2044- 8279.2011.02028.x

Snipes, J., Fancsali, C., & Stoker, G. (2012). Student academic mindset interventions: A review of the current landscape. Retrieved from https://www.impaqint.com/sites/default/files/project-

reports/impaq%20student%20academic%20mindset%20interventions%20report%20august%202012_0.pdf

Sousa, D., & Tomlinson, C. (2011). *Differentiation and the brain: How neuroscience supports the learner-friendly classroom.* Bloomington, IN: Solution Tree Press.

Sousa, T. (2019). Student retention is more important than ever. *Higher Ed Live.* Retrieved from higheredlive.com/3-reasons-student-retention-is-more-important-than-ever/

Spady, W. (1970). Dropouts from higher education: An interdisciplinary review and synthesis. *Interchange,* 1, 64-85.

Spinath, B., Freudenthaler, H., & Neubauer, A. (2010). Domain-specific school achievement in boys and girls as predicted by intelligence, personality and 90 motivation. *Personality and Individual Differences*, 48(4), 481-486. doi:10.1016/j.paid.2009.11.028

Starke, M. C., Harth, M., & Sirianni, F. (2001). Retention, bonding, and academic achievement: Success of a first-year seminar. *Journal of the First-Year Experience & Students in Transition*, *13*(2), 7-35.

Steele, C. M. (1997). A threat in the air: How stereotypes shape intellectual identity and performance. *American Psychologist*, 52(6), 613.

Stein, D. (2000). Teaching Critical Reflection. *Myths and Realities, 7*. Retrieved from https://www.calpro-online.org/eric/docs/mr00024.pdf

Steinmayr, R., & Spinath, B. (2009). The importance of motivation as a predictor of school achievement. *Learning and Individual Differences*, *19*(1), 80-90. Doi:10.1016/j.lindif.2008.05.004

Stephens, N. M., Hamedani, M. G., & Destin, M. (2014). Closing the social-class achievement gap: A difference-education intervention improves first-generation students' academic performance and all students' college transition. *Psychological Science*, 25(4), 943-953.

Sternberg, R. (2013). Research to improve retention. *Inside Higher Ed*. Retrieved from www.insidehighered.com/views/2013/02/07/essay-use-research-improve-student-retention

Stinebrickner, R., & Stinebrickner, T. R. (2003). Understanding educational outcomes of students from low-income families: Evidence from a liberal arts college with a full tuition subsidy program. *The Journal of Human Resources*, 38(3), 591–617. doi:10.3368/jhr.XXXVIII.3.591

Stipek, D., & Gralinski, J. H. (1996). Children's beliefs about intelligence and school performance. *Journal of Educational Psychology*, 88(3), 397.

Sun, K. L. (2015). There's no limit: Mathematics teaching for a growth mindset (Doctoral dissertation). Stanford University, Stanford, CA.

Sutherland, M., Smith, C., & McLean, A. (2004). A model for motivation. *Scottish Educational Review*, *36*(1), 79-88. Retrieved from http://ser.stir.ac.uk/pdf/276.pdf

Svinicki, M. (2016), Resilience: The Re-Interpretation of Failure? *The National Teaching & Learning Forum*, 25,12-12. doi:10.1002/ntlf.30076

Swail, W. S. (2004). The art of student retention: A handbook for practitioners and administrators. Austin, TX: Educational Policy Institute.

Tampke, D. (2013). Developing, implementing, and assessing an early alert system. *Journal of College Student Retention: Research, Theory, & Practice*, *14*(4), 2013. Retrieved from https://doi.org/10.2190/CS.14.4.e

Tandberg, D. & Hillman, N. (2014). State higher education performance funding: Data, outcomes, and policy implications. *Journal of Education Finance, 39*(3): 222-243.

Terrion, J. & Leonard, D. (2007). A Taxonomy of the characteristics of student peer mentors in higher education: Findings from a literature review. *Mentoring & Tutoring: Partnership in Learning, 15*(2), 149-64. www.dx.doi.org/10.1080/13611260601086311

Thayer, P. B. (2000). Retention of students from first generation and low-income backgrounds. *Opportunity Outlook*. (May), 2-9.

Thelin, J. (2011). *A History of American Higher Education*, (2nd ed.). Baltimore, MD: Johns Hopkins University Press.

Thompson R. A. (2014). Stress and child development. *Future Child, 24*(1) 41–59.

Tight, M. (2019) Student retention and engagement in higher education. J*ournal of Further and Higher Education*, 1-16.

Tinto, V. (1975). Dropout from higher education: A theoretical synthesis of recent research. *Review of Educational Research, 45*, 89–125. Retrieved from http://citeseerx.ist.psu.edu/viewdoc/download?doi=10.1.1.874.5361&rep=rep1&type=pdf

Tinto, V. (1987). *Leaving college: Rethinking the causes and cures of student attrition*. Chicago: University of Chicago Press.

Tinto, V. (1993). *Leaving college: Rethinking the causes and cures of student attrition*. (2nd ed.). Chicago: University of Chicago Press.

Tinto, V. (1999). Taking student retention seriously: Rethinking the first year of college. *National Academic Advising Association Journal*, *19*(2), 5-9.

Tinto, V. (2000). *Linking learning and leaving: Exploring the role of the college classroom in student departure*. In J. M. Braxton (Ed.), *Reworking the student departure puzzle* (pp. 81-94). Nashville, TN: Vanderbilt University Press.

Tinto, V. (2007). Research and practice of student retention: What next? *Journal of College Student Retention: Research, Theory & Practice*, 8(1), 1-19.

Tinto, V., Russo, P. & Kadel, S. (1994). Constructing educational communities: Increasing retention in challenging circumstances. *Community College Journal*, *64*(4), 26–29.

Torres, V. (2003). Influences on ethnic identity development of Latino college students in the first two years of college. *Journal of College Student Development*, *44*(4), 532-547.

Treanor, P. (2005). Neoliberalism: origins, theory, definition. Retrieved from http://web.inter.nl.net/users/Paul.Treanor/neoliberalism.html

University of Iowa. (2008). Early Intervention Task Force Final Report. Retrieved from https://studentsuccess.uiowa.edu/assets/8ab2204656/Early-Intervention-Task-Force-Report.pdf

U.S. Department of Education, National Center for Education Statistics. (2016). *Digest of Education Statistics*, *2014*, NCES 2016-006. Retrieved from http://nces.ed.gov/programs/digest/d14/ch_3.asp

Valentiner, D., Mounts, N., Durik, A., & Gier-Lonsway, S. (2011). Shyness mindset: Applying mindset theory to the domain of inhibited social behavior. *Personality and Individual Differences*, 50(8), 1174-1179. Retrieved from http://dx.doi.org/10.1016/j.paid.2011.01.021

Vandewalle, D. (2012). A growth and fixed mindset exposition of the value of conceptual clarity. *Industrial & Organizational Psychology, 5*(3), 301-305. doi:10.1111/j.1754-9434.2012.01450.x

Vedder-Weiss D., & Fortus, D. (2013). School, teacher, peers, and parents' goals emphases and adolescents' motivation to learn science in and out of school. *Journal of Research in Science Teaching*. 50, 952–988. doi: 10.1002/tea.21103.

Walters, E. (2004). Enhancing student learning and retention through the merger of the academic and student affairs unit: The olivet plan. *Journal of College Student Retention*, 5(1), 23-36.

Walton, G., & Cohen, G. (2007). A question of belonging: Race, social fit, and achievement. *Journal of Personality and Social Psychology,* 92(1), 82-96. doi:10.1037/0022-3514.92.1.82

Walton, G., & Cohen, G. (2011). A brief social-belonging intervention improves academic and health outcomes among minority students. *Science*, *331*, 1447- 1451. doi:10.1126/science.1198364

Walton, G., Cohen, G., Cwir, D., & Spenser, S. (2012). Mere belonging: The power of social connections. *Journal of Personality and Social Psychology*, 102(3), 513- 532. doi:10.1037/a0025731

Wang, M. T., Eccles, J. S., & Kenny S. (2013). Not lack of ability but more choice: individual and gender differences in STEM career choice. *Psychological Science, 24*, 770–775. doi: 10.1177/0956797612458937.

Weerts, D. J. (2014). State funding and the engaged university: Understanding community engagement and state appropriations for higher education. *The Review of Higher Education 38*(1), 133-169.

White, J. W. (2005). Sociolinguistic challenges to minority collegiate success: Entering the discourse community of the college. *Journal of College Student Retention: Research, Theory & Practice*, 6(4), 369-393.

Wilson, T. D., & Buttrick, N. R. (2016). New directions in social psychological interventions to improve academic achievement. *Journal of Educational Psychology*, 108(3), 392–396. https://doi.org/10.1037/edu0000111

Wilson, T., & Linville, P. (1985). Improving the performance of college freshmen with attributional techniques. *Journal of Personality and Social Psychology, 49*, 287- 293. doi:10.1037/0022-3514.49.1.287

Windham, M., Rehfuss, M., Williams, C., Pugh, V., & Tincher-Ladner, L. (2014) Retention of first-year community college students. *Community College Journal of Research and Practice*, *38*(5), 466-477.

Wood, L. & Wilson, R. (1972). Teachers with impact. *Research Reporter*, *7*(2), 1-4.

Wood, P. (2012). Supersizing: Obama's Higher Education Agenda, Part 1 of 8. *Chronicle of Higher Education's Innovations*. Retrieved from https://www.nas.org/blogs/dicta/supersizing_obamas_higher_education_agenda_part_1_of_8

Yeager, D., & Dweck, C. (2012). Mindsets that promote resilience: When students believe that personal characteristics can be developed. *Educational Psychologist*, *47*, 1-13. doi:10.1080/00461520.2012.722805

Yeager, D. S., & Walton, G. M. (2011). Social-psychological interventions in education: They're not magic. *Review of Educational Research*, *81*(2), 267–301. doi: 10.3102/0034654311405999

Yeager, D., Walton, G., & Cohen, G. (2013). Addressing achievement gaps with psychological interventions. *Phi Delta Kappan, 94*, 62-65.

Yeager, D. S., Walton, G. M., Brady, S. T., Akcinar, E. N., Paunesku, D., Keane, L. & Gomez, E. M. (2016). Teaching a lay theory before college narrows achievement gaps at scale. Proceedings of the National Academy of Sciences.

Zajacova, A., Lynch, S. M., & Espenshade, T. J. (2005). Self-efficacy, stress, and academic success in college. *Research in Higher Education*, 46, 677–706

Zimmerman, B., Moylan, A., Hudesman, J., White, N., & Flugman, B. (2011). Enhancing self-reflection and mathematics achievement of at-risk urban technical college students. *Psychological Test and Assessment Modeling*, 53, 141-160.

Appendix A--Study Measures

FIRST YEAR EXPERIENCE SURVEY

Please show how much you agree or disagree with each statement by marking the choice that corresponds to your opinion.

INTELLECT DOMAIN

Item	Strongly Agree	Agree	Somewhat Agree	Somewhat Disagree	Disagree	Strongly Disagree
1. You have a certain amount of intelligence, and you can't really do much to change it.						
2. Your intelligence is something about you that you can't change very much.						
3. No matter who you are, you can significantly change your intelligence level.						
4. To be honest, you can't really change how intelligent you are.						
5. You can always substantially change how intelligent you are.						
6. You can learn new things, but you can't really change your basic intelligence.						
7. No matter how much intelligence you have, you can always change it quite a bit.						
8. You can change even your basic intelligence level considerably.						

TALENT DOMAIN

Item	Strongly Agree	Agree	Somewhat Agree	Somewhat Disagree	Disagree	Strongly Disagree
1. You have a certain amount of talent, and you can't really do much to change it.						
2. Your talent in an area is something about you that you can't change very much.						
3. No matter who you are, you can significantly change your level of talent.						
4. To be honest, you can't really change how much talent you have.						
5. You can always substantially change how much talent you have.						
6. You can learn new things, but you can't really change your basic level of talent.						
7. No matter how much talent you have, you can always change it quite a bit.						
8. You can change even your basic level of talent considerably.						

WRITING DOMAIN

Item	Strongly Agree	Agree	Somewhat Agree	Somewhat Disagree	Disagree	Strongly Disagree
1. I enjoy writing when writing for a specific class or course.						
2. I enjoy reading when						

reading for a specific class or course.						
3. I enjoy writing for pleasure.						
4. I enjoy reading for pleasure.						
5. I currently consider myself to be a strong writer.						
6. I feel confident in my college level writing.						
7. I feel confident in my university level research skills.						
8. I believe that I am a better writer now than I have been in the past.						
9. My writing skills make me feel more confident about taking future college courses.						
10. My writing skills make me feel more confident about graduating from college.						

NOW A LITTLE ABOUT YOU…

Student ID Number

_____

Year in School

_____First Year (Freshman)

_____Second Year (Sophomore)

_____ **Your Age**

_____ Your Zip Code

_____ Your High School GPA

_____ Your ACT Composite Score

_____ Number of College Credits

Already Earned

Race

_____ African-American

_____ Hispanic

_____ American Indian

_____ Asian

_____ Caucasian

_____Race and Ethnicity Unknown

Gender

_____Male

_____Female

_____ Other

Mother's Level of Education

_____ Bachelor's Degree or Higher

_____ Associate's Degree

_____ Some College

_____ High School Degree

_____ Elementary School

_____ Unknown

Father's Level of Education

_____ Bachelor's Degree or Higher

_____ Associate's Degree

_____ Some College

_____ High School Degree

_____ Elementary School

_____ Unknown

Did you receive financial aid in the form of a Pell grant?

_____no

_____yes

What is your approximate average household income?

- (•) $0-$24,999
- ( ) $25,000-$49,999
- ( ) $50,000-$74,999

- $75,000-$99,999
- $100,000-$124,999
- $125,000-$149,999
- $150,000-$174,999
- $175,000-$199,999
- $200,000 and up

Appendix B—Course Schedule and Growth Mindset Treatment

Week One

Due Monday or Tuesday: "How Instagram Almost Ruined My Life" (Reading Journal) Print and bring to class

Read Everyday Writer, Sentence Grammar: 36, Parts of Speech

Read Everyday Writer, Writing Processes: 1, The Top Twenty: A Quick Guide to Troubleshooting Your Writing

In-Class Activities:
-Icebreaker
-Initial (Growth Mindset) Survey
-Entrance Assessment

Week Two

Due Wednesday or Thursday:
Read *Everyday Writer*, Punctuation and Mechanics: 49, End Punctuation, 50 Apostrophes, and 53, Capital Letters

Launchpad Solo-Punctuation and Mechanics: Apostrophes and Commas

Due Monday or Tuesday:
Launchpad Solo-Punctuation and Mechanics: Capitalization

Norton Reader, "Is Google Making Us Stupid?" (Reading Journal) Page 572, Read

Read *Everyday Writer*, Sentence Grammar: 37, Parts of Sentences

In-Class Activities:
-Grammar Boot Camp, -Commas Presentation
-Thesis and subtopics sheet
-Writing Hooks activity
-5 Paragraph Essay Presentation/Assignment
-Brain/Neuroscience Discussion

Week Three

Due Wednesday or Thursday:
Read Everyday Writer, Writing Processes: 3, Rhetorical Situations

Brain Science (Reading Journal) Print and bring to class

Due Monday or Tuesday:
Eckford Photo Journal Writing (Reading Journal) Print and bring to class

Fahrenheit 451, Pages 1-20

In-Class Activities:
-"Good/Bad" Technology Videos
-Ray Bradbury Presentation/Dystopia
-Fragment Presentation
-"Fixed Versus Growth Mindset Discussion

Week Four

Due Wednesday or Thursday:
5 Paragraph Essay Rough Draft
Bring a printed copy to class.

Read *Everyday Writer*, Research: 15, Integrating Sources and Avoiding Plagiarism

Song Narrative (Reading Journal) Print and bring class

"Superman and Me" (Personal Journal, nothing due)

Due Monday or Tuesday:
Read *Everyday Writer*, Punctuation and Mechanics: 48, Semicolons

Read *Fahrenheit 451*, pages 21-40

Launchpad Solo- Punctuation and Mechanics: Semicolons and colons

In-Class Activities:
-5 Paragraph Peer Editing
-Summary and Evaluation Group Activity
-Headline News (Formal Voice) PPT
-Terrifying Dystopia Clip

-Fixed Versus Growth Mindset Discussion continued and "The Power of Yet" video

Week Five

Final copy of the 5-paragraph essay. **Bring a printed, revised, FINAL copy to class**

Due Wednesday or Thursday:
Read Everyday Writer, Sentence Grammar: 38, Verbs and Verb Phrases

Hometown Narrative (Reading Journal)

Read Everyday Writer, Writing Processes: 6, Developing Paragraphs

Due Monday or Tuesday:
"Parent Criticizes Book Fahrenheit 451" (Reading Journal) Print and bring to next class

Banned/Challenged Book (Thinking Journal, nothing due)

Read F*ahrenheit 451*, pages 41-60

Read Everyday Writer-Sentence Grammar: 44, Prepositions and Prepositional Phrases

Launchpad Solo- Parts of Speech, Prepositions and Conjunctions

Read Everyday Writer, Style: 30, Coordination, subordination, and Emphasis

In-Class Activities:
-Narrative Essay Hooks Presentation
-Narrative Essay Assignment
-*Norton Reader* Summary and Analysis Group Project Work
-Risk vs. Perfection Discussion

Week Six

Due Wednesday or Tuesday:
Everyday Writer, Sentence Grammar: 42, Adjectives and Adverbs

"Heinrich Heine on Burning Books" (Reading Journal) Print and bring to class

Launchpad Solo-Parts of Speech: Verbs, adjectives, and adverbs

Burning a Book (Personal Journal-
Nothing Due)

Due Tuesday:
Read *Everyday Writer*, Sentence Grammar: 41, Pronouns and 43, Modifier Placement

Read *Fahrenheit 451*, pages 61-80

Launchpad Solo-Parts of Speech: Nouns and pronouns

In-Class Activities:
-Nazi Book Burning Video
-Book Burning Group Work

-Types of Essays and Expository Writing
-Descriptive Writing Workshop
-Beauty reading for M/W
-Learning Through Failure Discussion

Week Seven

Due Monday or Tuesday:
REMINDER--"Heinrich Heine on Burning Books" (Reading Journal) Print and bring to class

Due Wednesday or Thursday:
Narrative Essay Draft Due. Bring a PRINTED copy to class.

Everyday Writer, Sentence Grammar: 40, Subject-Verb Agreement and 46, Sentence Fragments

"The Country That Stopped Reading" (Reading Journal) Print and bring to class

Launchpad Solo-Grammar, Modifiers, and Pronouns

Due Monday or Tuesday:
Everyday Writer, Sentence Grammar: 45, Comma Splices and Fused Sentences

Read *Fahrenheit 451*, pages 81-100

Launchpad Solo-Grammar, Comma Splices and fused (run-on) sentences, and Fragments

In-Class Activities:
-Book Burning Group Work
-Mexico Education and Censorship Clips
Adjective/Beatty Passage Group Work
-Embracing Setbacks Discussion

Week Eight

Due Wednesday or Thursday:
Final Narrative Essay (Printed, NO LATE PAPERS)

Launchpad Solo: Grammar, Subject-verb agreement and Verbs

Due Monday or Tuesday:
"The Censors" (Thinking Journal) Nothing Due

Read *Fahrenheit 451*, pages 101-120

Read *Everyday Writer*, Language: 27, Language that Builds Common Ground and 28, Language Variety

Launchpad Solo-Style, Active and Passive Voice and Coordination and Subordination

Read *Everyday Writer*-Style: 32, Parallelism and Writing Processes: Reviewing, Revising, and Editing

In-Class Activities:
-Compare and Contrast Essay Presentation
-Watch Ray Bradbury's *Twilight Zone* episode.
-In-text Citation Activity
-Journal Discussion

Week Nine

Due Tuesday or Wednesday:
Bring a printed copy of your Comparison/Contrast theme to class

Everyday Writer, Critical Thinking and Argument: 11, Constructing Arguments

Launchpad Solo-Research: Evaluating, Integrating and Acknowledging Sources

Due Monday or Tuesday:
Everyday Writer, Language: 29, Word Choice and Spelling

Read *Fahrenheit 451*, pages 121-158

Launchpad Solo-Drafting: Topic Sentence and Supporting Details

In-Class Activities:
-Compare and Contrast Essay Writing Workshop
-Finish In-text Citation Activity
-MLA Template Practice
-Journal Discussion/Group

Week Ten

Read *Everyday Writer*, Style: 31, Consistency and Completeness, 33, Shifts, 34 Conciseness, and 35, Sentence Variety

Due Wednesday or Thursday:
Kurt Vonnegut Letter (Reading Journal) Print and bring to class

Bring a copy of your thesis statement to class

Due Monday or Tuesday:

Read Everyday Writer, Punctuation and Mechanics: 47, Commas

In-Class Activities:
-Book Burning Group Presentations
-(Rhetorical Strategies-Logos, Pathos, Ethos)
-*Norton Reader* Speed Dating
-*Night* video clip
-Thesis and Focused Writing Workshop (thesis musical chairs)

Week Eleven

Due Monday or Tuesday:
-Read *Everyday Writer*, Punctuation and Mechanics: 51, Quotation Marks and 54 Abbreviations and Numbers

Wednesday or Thursday:
Norton Reader, "Beauty: When the Other Dancer Is the Self" (Summary and Evaluation Group Work Due)

Farewell to Manzanar and excerpt from *Night* (Thinking Journal, Nothing Due)

In-Class Activities:
-Discussion of *Fahrenheit 451* Symbolism
-Paragraph Structure and Poetry Analysis Workshop
-Nature Writing Activity (Writing Journal/process feedback)
-Transcendentalism Presentation

Week Twelve

Due Monday or Tuesday:
Compare and Contrast Rough Draft Due. Bring a printed copy for peer editing

Due Wednesday or Thursday:
-Essay Exam over *Fahrenheit 451*

-Nature Writing Due

-Research Topic Selection, Autonomy in Selecting Topic and Research Methods

-Read *Everyday Writer*, Research: 12, Preparing for a Research Project and 13, Doing Research

Launchpad Solo-Documentation (MLA), How to cite a Book in MLA Style, How to cite a

database in MLA Style, How to cite an article in MLA Style, How to cite a website in MLA Style (Just watch the videos)

-Persuasive Group Work Assignment (due on last day of class).

-Read *Everyday Writer*, MLA Documentation, 57: The Basics of MLA Style

Due Monday or Tuesday:
-Choose Research Paper Topic (get email approval BEFORE coming to the library)

In-Class Activities:
-Research Paper/Citation/MLA Workshop
-Comparison/Contrast essay peer editing
-Peer Review/Using Feedback from Others

Week Thirteen

Due Monday or Tuesday:
-Compare and Contrast Final Essay Due (Bring printed copy to the library)

Due Wednesday or Thursday:
-Read *Everyday Writer*, Research: 14, Evaluating Sources and Taking Notes

-Research Paper Pre-Writing

Due Monday or Tuesday:
-Read Everyday Writer, MLA Documentation: 58, MLA Style for In-Text Citations and 59, MLA style for a List of Works Cited

In-Class Activities:
-Library Research Days
-Process Oriented Feedback on Essay (Feedback Sheet)

Week Fourteen

Due Monday or Tuesday:
Read *Everyday Writer*, Critical thinking and Argument: 10, Analyzing Arguments

In-Class Activities:
-MLA Presentation (Journals and Websites)
-Persuasive Group Work
-Instructor Evaluation
-Practice and Determination Discussion

Week Fifteen

Due Monday or Tuesday:

Norton Reader, "Beauty: When the Other Dancer Is the Self" (Summary and Evaluation Group Essay) Print and bring one copy to class

The Great Imagination Heist" (Personal Journal)

Read Everyday Writer, Punctuation and Mechanics: 55, Italics, and 56, Hyphens

Wednesday or Thursday:

Research Paper Rough Draft Due--2 printed copies (Peer Critiques)

Due Monday or Tuesday:

Read Everyday Writer, Research: 16, Writing a Research Project

In-Class:

-Peer Editing
-Persuasive Group Work
-*Waiting for Superman* Clips
-"HELP" Conferences (students must ask at least one questions about their draft or the writing process)

Week Sixteen

Monday or Tuesday:

Exit Assessment

Research Paper Due

Wednesday or Thursday:

Group Persuasive Ad (with Rhetorical Strategies) Presentation

BONUS-*Norton Reader*, "Letter to President Pierce" page 543, Summary and Evaluation, Print and bring to class.

BONUS-*Norton Reader*, "Freemont High School" (Reading Journal-page 423, Summary and Evaluation, Print and bring to class.

BONUS-*Norton Reader*, "To Siri, with Love: How One Boy with Autism Became BFF with Apple's Siri"-Page 628, questions #1 and #2 Print and bring to next class.

BONUS-Read any *Norton Reader* essay (that hasn't been used for class or your Compare and Contrast essay) and write a Reading Journal. Print and bring to class.

BONUS-Excerpt from "Darkness at Noon" Choose a quote and write a Reading Journal. Print and bring to class.

In-Class Activities:

-Group Persuasive Essay Presentations

-Exit Assessment and Final Survey

Appendix C: Using Growth Mindset in Gateway Courses Data Code Book

Entrance and Exit Assessment

Student Scored at 70% or above: 0 =no, 1 =yes, 9 =no score reported

Gender: 0 = male, 1= female, 2 =other, 9 =unknown

First Generation College Student: 0 = no, 1 = yes, 9 = unknown

Ethnicity: 1=students of color, 0 =not students of color, 9 =unknown

Growth Mindset/Writing Survey

You have a certain amount of intelligence, and you can't really do much to change it.
0 = Strongly Agree, 1= Agree, 2 =Somewhat Agree, 3 = Somewhat Disagree, 4 =Disagree, 5 =Strongly Disagree, 9= no response/skipped

Your intelligence is something about you that you can't change very much.
0 = Strongly Agree, 1= Agree, 2 =Somewhat Agree, 3 = Somewhat Disagree, 4 =Disagree, 5 =Strongly Disagree, 9= no response/skipped

No matter who you are, you can significantly change your intelligence level.
0 = Strongly Agree, 1= Agree, 2 =Somewhat Agree, 3 = Somewhat Disagree, 4 =Disagree, 5 =Strongly Disagree, 9= no response/skipped

To be honest, you can't really change how intelligent you are.
0 = Strongly Agree, 1= Agree, 2 =Somewhat Agree, 3 = Somewhat Disagree, 4 =Disagree, 5 =Strongly Disagree, 9= no response/skipped

You can always substantially change how intelligent you are.
0 = Strongly Agree, 1= Agree, 2 =Somewhat Agree, 3 = Somewhat Disagree, 4 =Disagree, 5 =Strongly Disagree, 9= no response/skipped

You can learn new things, but you can't really change your basic intelligence.
0 = Strongly Agree, 1= Agree, 2 =Somewhat Agree, 3 = Somewhat Disagree, 4 =Disagree, 5 =Strongly Disagree, 9= no response/skipped

No matter how much intelligence you have, you can always change it quite a bit.
0 = Strongly Agree, 1= Agree, 2 =Somewhat Agree, 3 = Somewhat Disagree, 4 =Disagree, 5 =Strongly Disagree, 9= no response/skipped

You can change even your basic intelligence level considerably.
0 = Strongly Agree, 1= Agree, 2 =Somewhat Agree, 3 = Somewhat Disagree, 4 =Disagree, 5 =Strongly Disagree, 9= no response/skipped

You have a certain amount of talent, and you can't really do much to change it.
0 = Strongly Agree, 1= Agree, 2 =Somewhat Agree, 3 = Somewhat Disagree, 4 =Disagree, 5 =Strongly Disagree, 9= no response/skipped

Your talent in an area is something about you that you can't change very much.
0 = Strongly Agree, 1= Agree, 2 =Somewhat Agree, 3 = Somewhat Disagree, 4 =Disagree, 5 =Strongly Disagree, 9= no response/skipped

No matter who you are, you can significantly change your level of talent.
0 = Strongly Agree, 1= Agree, 2 =Somewhat Agree, 3 = Somewhat Disagree, 4 =Disagree, 5 =Strongly Disagree, 9= no response/skipped

To be honest, you can't really change how much talent you have.
0 = Strongly Agree, 1= Agree, 2 =Somewhat Agree, 3 = Somewhat Disagree, 4 =Disagree, 5 =Strongly Disagree, 9= no response/skipped

You can always substantially change how much talent you have.
0 = Strongly Agree, 1= Agree, 2 =Somewhat Agree, 3 = Somewhat Disagree, 4 =Disagree, 5 =Strongly Disagree, 9= no response/skipped

You can learn new things, but you can't really change your basic level of talent.
0 = Strongly Agree, 1= Agree, 2 =Somewhat Agree, 3 = Somewhat Disagree, 4 =Disagree, 5 =Strongly Disagree, 9= no response/skipped

No matter how much talent you have, you can always change it quite a bit.
0 = Strongly Agree, 1= Agree, 2 =Somewhat Agree, 3 = Somewhat Disagree, 4 =Disagree, 5 =Strongly Disagree, 9= no response/skipped

You can change even your basic level of talent considerably.
0 = Strongly Agree, 1= Agree, 2 =Somewhat Agree, 3 = Somewhat Disagree, 4 =Disagree, 5 =Strongly Disagree, 9= no response/skipped

I enjoy writing when writing for a specific class or course.
0 = Strongly Agree, 1= Agree, 2 =Somewhat Agree, 3 = Somewhat Disagree, 4 =Disagree, 5 =Strongly Disagree, 9= no response/skipped

I enjoy reading when reading for a specific class or course.

0 = Strongly Agree, 1= Agree, 2 =Somewhat Agree, 3 = Somewhat Disagree, 4 =Disagree, 5 =Strongly Disagree, 9= no response/skipped

I enjoy writing for pleasure.
0 = Strongly Agree, 1= Agree, 2 =Somewhat Agree, 3 = Somewhat Disagree, 4 =Disagree, 5 =Strongly Disagree, 9= no response/skipped

I enjoy reading for pleasure.
0 = Strongly Agree, 1= Agree, 2 =Somewhat Agree, 3 = Somewhat Disagree, 4 =Disagree, 5 =Strongly Disagree, 9= no response/skipped

I currently consider myself to be a strong writer.
0 = Strongly Agree, 1= Agree, 2 =Somewhat Agree, 3 = Somewhat Disagree, 4 =Disagree, 5 =Strongly Disagree, 9= no response/skipped

I feel confident in my college level writing.
0 = Strongly Agree, 1= Agree, 2 =Somewhat Agree, 3 = Somewhat Disagree, 4 =Disagree, 5 =Strongly Disagree, 9= no response/skipped

I feel confident in my university level research skills.
0 = Strongly Agree, 1= Agree, 2 =Somewhat Agree, 3 = Somewhat Disagree, 4 =Disagree, 5 =Strongly Disagree, 9= no response/skipped

I believe that I am a better writer now than I have been in the past.
0 = Strongly Agree, 1= Agree, 2 =Somewhat Agree, 3 = Somewhat Disagree, 4 =Disagree, 5 =Strongly Disagree, 9= no response/skipped

My writing skills make me feel more confident about taking future college courses.
0 = Strongly Agree, 1= Agree, 2 =Somewhat Agree, 3 = Somewhat Disagree, 4 =Disagree, 5 =Strongly Disagree, 9= no response/skipped

My writing skills make me feel more confident about graduating from college.
0 = Strongly Agree, 1= Agree, 2 =Somewhat Agree, 3 = Somewhat Disagree, 4 =Disagree, 5 =Strongly Disagree, 9= no response/skipped

Year in School: 0 =Freshman, 1 =Sophomore, 9 = no response/skipped
Gender: 0 = male, 1= female, 2 =other, 9 = no response/skipped
Ethnicity: 1=students of color, 0 =not students of color, 9 = no response/unknown

Student received financial aid in the form of a Pell grant? 0 =no, 1 =yes, 9= no response/skipped

Mother's Level of Education: 0= Bachelor's Degree or Higher, 1 = Associate's

Degree, 2 = Some College, 3 = High School Diploma, 4 = Elementary School, 5 = unknown or no response

Father's Level of Education: 0= Bachelor's Degree or Higher, 1 = Associate's Degree, 2 = Some College, 3 = High School Diploma, 4 = Elementary School, 5 = unknown or no response

Approximate Average Household Income: 0 =$0-$24,999, 1 =$25,000-$49,999, 2 =$50,000-$74,999, 3 =$75,000-$99,999, 4 =$100,000-$124,999, 5 =$125,000-$149,999, 6 =$150,000-$174,999, 7 =$175,000-$199,999, 8 = $200,000 and up, 9= no response/skipped