Chapter 7
Grit Lit: An Effort to Cultivate Grit and Task Perseverance Through a High-School Language Arts Curriculum

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Abstract Angela Duckworth's 2013 TED Talk explored her research on the statistical correlation between grit and success in many mentally and physically strenuous situations. Grit is defined as passion and perseverance for long-term goals. Duckworth's speech also contained a subsequent challenge for researchers to explore ways to build grit within young people, and this chapter attempts to meet that challenge. The purpose of this chapter was to develop and determine the effectiveness of a ninth-grade English Language Arts curriculum designed to enhance grit at a rural Midwestern public high school. Specifically, it aimed to increase task perseverance by utilizing multiple motivational theories of achievement to help students build grit in their academic careers and beyond. These tenets were reinforced through several intentional methodologies including, first and foremost, reading grit-themed textual materials with an increased level of rigor, rewarding student effort by allowing revision for assessments, providing effort-based feedback to cultivate growth mindset, and tracking student performance and mastery goals over time. Quantitative data was obtained through a pre- and post-assessment on grit, a pre- and post-assessment on task perseverance in the form of student writing revision attempts. Additionally, posthoc qualitative reflections of the highest-performing participants on the effectiveness of each component of the strategy. Specific within-person changes on the subscales will be evaluated and limitations of the research described. Additionally, suggestions for further study are considered and implications for policy changes in English Language Arts classrooms.

Keywords Growth mindset · High school students · Motivational theories · Task perseverance

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7.1 Introduction

Angela Duckworth's interest in grit research developed after spending time teaching in a public school district. She started to notice a strange phenomenon between her lowest and highest achievers regarding intelligence: "Some of my strongest performers did not have stratospheric IQ scores. Some of my smartest kids weren't doing so well" (TED, 2013). This led her to believe that being successful in school and in life is about much more than being able to learn effortlessly, which led her to the exploration of the relationship between success and effortful persistence over extended periods of time. There was a noncognitive factor at play, which she termed "grit," and defined as "passion and perseverance for long-term goals" (Duckworth, Peterson, Matthews, & Kelly, 2007).

To provide validation to the theory that grit is the most accurate predictor of success and motivation across a wide range of scenarios, Duckworth et al. (2007) studied individuals in some of the most difficult situations to determine which factors of their personalities differentiated them enough to push them through their challenges. When the authors published their 2007 article, "Grit: Passion and Perseverance for Long-Term Goals," a compilation of the results of five different independent but interrelated studies, the implications were quite groundbreaking, with grit showing a significant impact on level of education, consistency in careers, college GPA, and even West Point retention rates (Duckworth et al., 2007; Kelly, Matthews, & Bartone, 2014). Studies replicated results showing the importance of grit in Teach for America success rates (Duckworth, Quinn, & Seligman, 2009), Army Special Operations training retention (Eskreis-Winkler, Shulman, Beal, & Duckworth, 2014), retention in difficult sales careers (Eskreis-Winkler et al., 2014), graduation rates from Chicago Public Schools (Eskreis-Winkler et al., 2014),, African-American school success at predominantly white universities (Strayhorn, 2014), non-traditional doctoral student GPA (Cross, 2014), performance (Van Zyl, Olckers, & Roll, 2020) and even success in marriage (Eskreis-Winkler et al., 2014).

When asked if grit can be taught or built up over time, Duckworth was surprisingly candid. Her response: "The honest answer is, I don't know" (TED, 2013). Because of this obvious gap in the research, researchers have already set out to determine the origins of grit and whether it is more hereditary or malleable in nature. Rimfeld, Kovas, Dale, and Plomin (2016) performed a grit study using 2321 twin pairs born between 1994 and 1996 in England and Wales. Grit was assessed at age 16, and correlation was used to estimate associations between the two twins' results. Their results showed that grit was "moderately heritable, with genetic factors explaining about a third of the variance" (p. 785), while shared environmental factors, such as growing up in the same family and attending the same schools, "explained no significant variance in these scales" (p. 786). While this may seem discouraging, Rimfeld et al. (2016) added that "heritability does not imply immutability," and that "this finding does not limit the possible effect of a novel intervention that is not currently part of the environmental variation" (p. 786). However, few intervention studies exist to determine if grit can be improved over time. This

problematic because experimental research is imperative to establish the value-add of constructs under investigation.

This "novel intervention" is exactly what I hypothesized and sought to verify at a rural Midwestern public high school in the United States. Building grit has been "set as a priority by the U.S. Department of Education and the U.K. Department of Education" (Rimfeld et al., 2016, p. 781) with a clear lack of empirical evidence that it is even possible to do so. If, as Franklin Bobbitt (1926) suggested, the purpose of schools and school curriculum is to prepare students for the future, and they should be "influential in shaping character and conduct" (p. 474), then attempts at cultivating this character trait through new and inventive approaches must be endeavored. Though there is some evidence currently to suggest that grit may be a malleable trait and able to be improved with interventions (Eskreis-Winkler, 2015), little to no research has been done with secondary students in an educational setting.

Though grit seems to be a manifestation of goals only through enduring progress and struggle over time, some researchers have also explored its connection to everyday learning activities and challenges to find significant connections (Gerhards & Gravert, 2015; Lucas, Gratch, Cheng, & Marsella, 2015; Suzuki, Tamesue, Asahi, & Ishikawa, 2015; Von Culin, Tsukayama, & Duckworth, 2014). From an educational perspective, it is imperative that students undergo what Bullmaster-Day (2015) calls the "productive struggle—effortful practice that goes beyond passive reading, listening, or watching" (p. 2). When students are challenged, it is important for them to struggle with their work before mastering the material to eventually gain complete command over it. This type of short-term struggle is called "task perseverance," which is defined as the ability to persist in achieving or completing a challenge despite competing goals, difficult distractions, or physical/mental hardships. Only task perseverance will allow students to reach this level of learning and pave the way for their future goals, hence showing a longer-term perseverance (grit).

7.2 Grit-Building Curriculum

7.2.1 The Theoretical Grounding of the Grit-Building Curriculum

The question of why some students lack grit and why they are unsuccessful in the classroom, despite being capable of doing so, has plagued educators for decades. The purpose of this study is to develop a specific curriculum that addresses these concerns and evaluate the effectiveness of that intervention. Despite what some students may outwardly project, they care about being perceived as successful and intelligent by others; yet despite the proven benefits of work ethic, trying harder puts some students at risk (Deci, Vallerand, Pelletier, & Ryan, 1985, p. 326). It is, therefore, not a mystery why some students would rather gladly accept failure without true effort than expose themselves to the vulnerability of failing with

it. Several theories form the basis for the grit-building curriculum: attribution theory, goal-setting theory, self-control, locus of control, self-efficacy, and growth mindset. All of these constructs tangentially relate to grit, and thus need to be taken into consideration when formulating an intervention.

The nature of the problem that this intervention addresses can be succinctly explained by Anthony Weiner's attributional theory of achievement motivation and emotion is inextricably tied to the concept of grit, which is shown through its clear influence on more recent motivation philosophy (Bandura, 1989; Dweck, 2006; Schwarzer, 2014). Attribution theory is still relevant because it explains motivation in relation to hypotheticals related to effort and achievement, especially in relation to education. In short, the scenarios can be summed up in the following manner: if students expend effort on a skill or assignment and succeed, they will be more likely to expend a similar amount of effort in the future. If students do not expend effort on a skill or assignment and still succeed, they will likely continue to expend little effort in the future with the prediction of future success based on their past experience. If students do not expend effort and do not succeed, they are likely to expend more effort on the next skill or assignment in an attempt to improve their next results. Finally, if students do expend honest effort but still fail, then they are likely to reach a point of defensive pessimism, holding unrealistically low standards so as not to be disappointed (De Castella, Byrne, & Covington, 2013). Therefore, the goal of educators should be to change the meaning of failure and create instances wherein a true exhibition of grit is the only true path to success. According to Weiner's theory, people attribute both successes and failures to either stable or unstable causes. Stable means that the outcome cannot be controlled by the individual, and therefore he or she is not likely to change if the situation is duplicated (Weiner, 1980). Unstable causes, on the other hand, are those that are likely to yield desired results based on the actions and attitudes of the participant. Unstable attributions mean that the participant sees a personal ability to affect change, and the goal of instruction is to help all students see their ability to change and improve their conditions because of their own effort (Weiner, 1980). Thus, the goal of educators should be to persuade students that their successes and failures can be attributed to unstable causes, and that when students' behaviors are exemplary, then positive, desired results will likely follow.

Goal-setting theory, first expressed by Bandura (1997) outlined a hierarchy of goal systems that every individual possesses in some manner or another. The very definition of grit reinforces the importance of goals, especially long-term ones. In fact, grit has sometimes been referred to as "goal commitment" in some texts—specifically those before Duckworth and her colleagues coined the term. Though grit is primarily centered around distal goals, proximal goals, or those considered closer at hand, have been proven beneficial to reaching as well. Proximal goals can also be described as subordinate goals, if used correctly. This means that proximal goals should be set so that they build up the higher-order goal, the long-term one that inspires students to work toward the future (Bandura & Schunk, 1981). Part of the reason why gritty individuals are so successful because they have the attitude that when one door closes, another door opens. When faced with challenges, these

students can invent a new way forward by creating alternative lower-order goals when one path closes (Duckworth & Gross, 2014).

Self-control is crucial for an individual to be considered gritty. Bandura (1997) asserted that people use hierarchical structure to align subordinate task goals to their higher-order goals. For gritty individuals, lower-order goals must align with the dominant goal. These people either are able to push off competing subordinate goals or lack them entirely (Duckworth & Gross, 2014, p. 322). This means that they simply let nothing get in the way of their long-term goal; they are able to avoid distractions, delay gratification, and focus on the main task at hand (Goodwin & Miller, 2013, p. 2). In essence, gritty individuals exhibit this same self-control by pushing off their immediate wants for their eventual needs.

J. B. Rotter's *locus of control* is considered a "belief that individuals create about themselves" and their interactions with the world around them; these can "cause distress or act as an interpersonal resource" (Gifford, Briceno-Perriott, & Mianzo, 2006, p. 19). Locus of control determines if individuals blame their own behavior for what happens in life or whether they attribute those outcomes to external circumstances (Hoerr, 2012, p. 84). The locus of control scale is used to describe students' opinions of how much they can control the circumstances of their own life, specifically their "learning behaviors and achievement" (Bulus, 2011, p. 542). Individuals with an internal locus of control (internals) believe that the outcomes in their lives depend mostly on what they do to control them, while individuals with an external locus of control (externals) believe that most circumstances are beyond their own control (Dollinger, 2000, p. 1). On the other hand, internals more actively exert more control over their lives; they do more to avoid failure, partly because of their knowledge of their environment (Lefcourt, 1976, p. 65). Students with an internal locus of control have also been proven to obtain higher test scores and credit their academic success "to internal factors rather than fate, luck or powerful others used by those with an external locus of control" (Kaiser, 1975, p. 426). Internals do more to help themselves because they feel that the weight of responsibility is on them to find success (Chubb, Fertman, & Ross, 1997); they are more aggressive than passive in gathering information that may prove helpful to them in order to achieve their goals.

Albert Bandura was also a pioneer in the studies on *self-efficacy*. As Bandura (1982), himself, explained, self-efficacy is defined as an evaluation of "how well one can execute courses of action required to deal with prospective situations" (p. 122). Self-efficacy is developed most notably through social support, which involves peer and teacher feedback, and these can also help to determine the outcome expectation for the student involved (Schunk, 1995). A study by Collins (1985) showed that self-efficacy could be a key factor in predicting achievement and motivation in school settings. When students in this study were given a wide range of problems, including some that were unsolvable, and they were also given unlimited opportunities to rework those problems. Those students who identified as having high self-efficacy tried longer on the difficult problems and even reworked more problems that they missed, despite their (lack of) aptitude in the subject areas. Regardless of ability,

students with high self-efficacy worked harder and performed better than those who had low self-efficacy (p. 104).

Self-efficacy also plays a large role in developing grit. Students must see that their success is a result of their efforts, not of their skills, or at least as a result of their skills because of their efforts. Erez and Judge (2001) also affirmed that the process of setting goals has clear benefits, but these benefits are lost unless individuals are willing to commit to them (p. 1272), and research has shown that students need self-efficacy to commit to goals. Outcome expectations are crucial to establishing self-efficacy. Students are not usually motivated to succeed if they do not believe it is possible; they are more motivated to protect themselves from the negative outcomes of failure (Schunk, 1989, p. 14). If students do not believe they can be successful in completing their desired goals, based on their past experiences and the experiences of comparable peers, "they have little incentive to undertake activities or to persevere in the face of difficulties of failures" (Caprara, Gerbino, Paciello, Di Giunta, & Pastorelli, 2010, p. 36). This further develops the point: grit cannot exist without self-efficacy.

Not unrelated to self-efficacy is Carol Dweck's emerging trend on building grit called *growth mindset*. Dweck (2006) argued that self-efficacy is important, but only after the student has taken proper preparation has for a specific challenge. In fact, self-efficacious behaviors without first expanding effort can be damaging, if not immediately, then at least in the long-term. In fact, Dweck's (2006) book *Mindset: The New Psychology of Success* is full of examples of former prodigies or young phenomena whose initial talent was eventually exceeded by those who expanded more effort over time, hence demonstrating more grit. Dweck (2006) elaborated: "In the fixed mindset, you don't take control of your abilities and your motivation. You look for your talent to carry you through, and when it doesn't, well then, what else could you have done? You are not a work in progress, you're a finished product. And finished products have to protect themselves, lament, and blame. Everything but take charge" (p. 103). Successful individuals have a growth mindset; they feel that intelligence is not fixed and can improve with effort. They also feel that failure is not permanent and is part of the learning and growing process (Elish-Piper, 2014, p. 59). If every student exhibited this attitude, it is undeniable that educators would see more productivity in the classroom, and as a result, more growth within students.

7.2.2 Tenets and Implementation of the Grit-Building Curriculum

The grit-building curriculum consisted of five core principles. These tenets are the constructs of the attributional retraining process, the process which builds grit in students. These are not only focused on the literature that these students read, but they are also focused on classroom policies and teacher behaviors as well. They are

as follows: rigor, ownership, effort, goal-setting, feedback, and, of course, grit-based literature.

The first common theme that has emerged through the research is that curriculum must challenge students, and it must challenge them to the point of failure. This is what Hoerr (2013) calls "creating the frustration" (p. 22), and it is essential for cultivating gritty students. Presumably, as Goodwin and Miller (2013) reinforce, holding higher expectations will lead to higher academic outcomes; providing challenging goals encourages greater effort and determination. Some students, however, simply cannot conquer their own fears that they are inadequate. Fear of failure was positively correlated with "helplessness, self-handicapping, truancy, and disengagement," and though these are perceived as apathy, they may be the consequences of "caring too much about the prospect of failure and what it means" (De Castella et al., 2013, p. 875). Hoerr (2012) argued that we can eliminate some of these consequences of failure avoidance by teaching students that failure is okay, and it is only a small step in the process of accomplishment. We should prepare youths to "anticipate misfortunes and point out that excellence in any discipline requires years and years of time on task" (Duckworth et al., 2007, p. 1100). It is essential to understand that becoming successful at any challenging endeavor takes time and effort, and failure is an essential part of that growth experience.

This is exactly what this unit seeks to accomplish. Though the assignments and performance assessments themselves were not altered from what ninth-grade English has previously used, the students must read at a higher level to reach that level of productive struggle. As a result, they may have to read—and reread—the material to fully grasp it. The reading levels of the assigned readings are included in the curriculum maps that I have provided at the "Committed 2 Learning Blog" (Sinclair, 2020). It is important to note that regular class assignments were used as formative assessments, which means that students understood that they would not be penalized for trying and failing to grasp the content and demonstrate mastery on the regular classwork. This ensures that students are exposed to the *rigor* without it negatively affecting their academic grades.

Another aspect of the curriculum that I employed for this group of students is the classroom policies in place, especially regarding paper rewrites and assessment retakes. In the grit-building curriculum, students had unlimited opportunities to retest or redo pertinent assignments. As long as the students prove that they have learned the material, this is considered the main goal in the process. Therefore, if they complete the retake process, students will be allowed to work to relearn material and have the chance to prove that they have mastered it, or at the very least, shown some progression of learning to reach their goals. This falls in line with Hoerr's (2013) suggestion to "require a student to revise and revise again until his or her work is perfect" (p. 22). In short, these opportunities to improve work and skills provide students an opportunity to counteract the rigor of the assessments.

The students must accept the fact that they are in charge of their own outcomes: that they must take *ownership* of their actions and they must believe that they have the power to change them in a positive manner. Locus of control is a crucial aspect of building grit. To make positive changes in students' lives, they must first believe that

they are capable of making these changes. They must know that it is possible to change their own circumstances, however unfavorable they may be. Attributional retraining is a process in which teachers use to shift a student's locus of control from external to internal (Perry, Perry, Stupnisky, Hall, Chipperfield, & Weiner, 2010). In some ways, this is exactly what growth mindset teaching is attempting to accomplish as well. One piece of attributional retraining that was utilized related to the retake and rewrite policy that was set in place. To be able to redo work, students will first have to fill out a "Take Ownership Sheet," which you may also find at the "Committed 2 Learning Blog" (Sinclair, 2020). On this reflection, students were asked to acknowledge their lack of skill, time management, or study habits. In other words, they needed to acknowledge what they should have done better, and what they plan to do better for the redone assignment. The point of this assignment is twofold: (1) to ensure that students put in extra work to earn the privilege of making up the work that they were not responsible or skillful enough to complete the first time, and (2) to make students acknowledge that they did not work hard enough to complete the assignment the first time around. In effect, this mandatory reflection attempts to internalize their locus of control and create clear proximal goals before they are given the opportunity to benefit from the policy.

The concept of growth mindset, the ability to overcome these shortcomings, to adapt and improve their intelligence through their own *effort*, was reflected through the writing assignments during the grit-building unit. The first grit-based writing was a poetry project (Sinclair, 2020), which asked students to reflect on the importance of grit to their distal goals. The other thematically-tied assignment was a narrative in which students were asked to write to a college entrance board about a time that they learned a new skill or trait—or somehow otherwise persevered—because of their hard work (Sinclair, 2020), and it reflects the work of Aronson et al. (2002) in which students were assigned to write about the effects of their efforts on intelligence, which implies that students can be pushed away from a fixed mindset when they reflect on their own intelligence and school experiences.

The curriculum must promote and reward hard work. This directly ties into the next common theme among current research: it is necessary to teach students how to work hard for them to reap the benefits of their consistent effort and self-control. People nearly always perform better if they focus on what they can control—their effort and persistence—rather than what they cannot, like their natural skill or aptitude (Glenn, 2010). Self-control is necessary for this consistent effort because students must work through distractions and competing subordinate goals to reach their ultimate desired destinations. Learning and success must be associated with "hard work, practice, and persistence" (Elish-Piper, 2014, p. 59). However, it is not always safe to assume that students know what it takes to put in the work to succeed, or even what it means to work with stamina and self-control. Some students do not even know where to begin in this regard but teaching to Vygotsky's (1978) zone of proximal development is extremely important. Vygotsky asserts that the skill or material being taught should be situated between what the student can already do by him or herself (which is too easy) and what the student cannot do without help (which is too difficult). The ZPD focuses on what the student can do with help from a

more knowledgeable other, like a teacher or peer who can guide the student through the material to find some success. Siegel and Shaughnessy (1996) argued that, eventually, when consistent effort is given, it is necessary to lessen task difficulty, or provide more help from the more knowledgeable other, so that lower-achieving students can find some success, to see that effort will pay off in the end.

Again, the retake and rewrite policy specifically relates to this aspect of class as well. There is one last requirement to be able to redo work in the grit-building curriculum. The requirement is that students spend at least one tutorial session to relearn the material or to discover the necessary changes that need to be made to their work to improve it. The point of this aspect of the policy is that students must put in extra work to reap the rewards of the system. If this class provides them an opportunity for their work to pay off, then hopefully it will carry over into other areas of their lives as well.

The main adaptation in this curriculum is the concept of growth mindset and how it is promoted through the reading and writing throughout this curriculum. All the poetry, non-fiction, and fiction pieces, outlined in Sinclair (2020), that were featured in the "grit lit" unit are based on the theme of hard work and determination despite setbacks or failures. Each text promotes the use of persistence to work toward goal completion. Some of the non-fiction even promotes growth mindset itself, using literature to promote the concept of building intelligence through work ethic.

Another adaptation is that students were allotted time in class to do most assignments and studying. This eliminated the ability for parents to interfere with the learning process, giving some students an unfair advantage in the classroom, those with a solid support system at home. It also eliminated the disadvantage for students who have unstable home environments. Additionally, student success on assignments and on assessments without working for their goals becomes more unlikely because they are being supervised in the classroom and encouraged to practice their skills. In this sense, students could attribute their successes to this obligatory guided practice time in class. If they succeed without effort, this results in negative attributional thinking. Students could begin to see that they can succeed without working and then continue a negative trend that will affect them down the road, when the material becomes more difficult. However, if they see that their successes come after studying or preparing for assessments in class, then attributing their success to skill that does not need maintained becomes much less likely.

The students must set clear, challenging *goals*. The positive effects of goal setting have been proven repeatedly. As Rader (2005) pointed out, "When students write down their goals, they are forced to examine themselves and see their own dreams. This is important because, ultimately, reflecting on why they hope to achieve their goals, rather than simply knowing what their goals are, is what motivates them to pursue their life ambitions" (Rader, 2005, p. 123). Because of the strong evidence that supports the benefits of goal-setting, students in the grit curriculum will be encouraged to set performance, mastery, and boundary goals. Therefore, this curriculum employs all of these. Students also completed a "Student Goal Commitment Sheet" (Sinclair, 2020), to address both performance and mastery goals in accordance with goal theory.

The teacher must provide specified *feedback* toward both performance and mastery goals. The last tenet of the grit-building curriculum is the teacher feedback that must take place for students to find success in attributional retraining. In general, teacher feedback should focus not on the skills of the students, but the work that they put toward their goals. Dweck (2006) reflected the importance of this type of feedback in her book *Mindset: The New Psychology of Success*. When Dweck gave students a nonverbal IQ test, two groups of students were initially equal in ability. But when one group received praise on ability and the other received praise on effort, their behaviors started to differ, especially in the ability-praise group. "As we feared, the ability praise pushed students right into the fixed mindset, and they showed all the signs of it, too: When we gave them a choice, they rejected a challenging new task that they could learn from. They didn't want to do anything that could expose their flaws or call into question all of their talent" (p. 72). This directly contrasts the ability-praise group, 90% of whom wanted to accept the challenge of the new task. Their attitudes were the most impressive part, however, because the effort-praised students found that the challenging problems were the most enjoyable. Schunk (1995) explained this phenomenon clearly: "When persons succeed easily, ability feedback is credible and increases self-efficacy, motivation, and performance. When students have to work hard to succeed, they may discount ability feedback in favor of effort. As they become more skillful, switching to ability feedback is desirable because students believe that their ability is increasing" (Schunk, 1995, p. 119).

However, feedback on everyday events that take place in the classroom is not the only type that is important. As Hoerr (2014) put it, "Setting goals is just a starting point. Progress toward goals must be monitored throughout the year" (p. 84). Therefore, the grit curriculum utilized one-on-one conferences for students every other week of the six-month unit during independent work time. For these classes, students were asked to attach their "Student Goal Sheet" to the front of their class binders. Not only did this provide a constant reminder of what students were striving for in the long-term, but it also provided me with an easy way to assess and share progress toward those goals based on current grades, behaviors, and overall performance.

One of the core principles of this intervention is that the literature and vocabulary of the unit was centered on grit, using the key concepts of the framework listed above. All the poetry, short stories, and non-fiction pieces, along with the drama and novel that the students read were tied thematically, and that theme is that perseverance and determination yield results. The literature and grit-themed vocabulary featured in this instructional section is shown in the "Committed 2 Learning Blog" (Sinclair, 2020). This unit is an adaptation of the science fiction unit, which was previously taught in all 9th grade classrooms and was continued for half of all ninth graders at the high school: those not participating in the experiment.

As Hoerr (2013) argued, teaching the vocabulary of grit is crucial to establishing a culture of it in the classroom. For students to make thematic connections to the literature, they must first understand the vocabulary involved. Once this learning occurs, teachers need to use this vocabulary in functional ways in the classroom and

on assignment and assessment feedback. He added, "If your students are occasionally included in parent-teacher conferences, grit would be a wonderful topic for discussion. Having everyone around the table increases the likelihood that parents and educators can work together to help students develop grit" (Hoerr, 2013, p. 21). Therefore, it is 100% necessary to include grit-based vocabulary relating to and included in the literature throughout this unit.

7.3 Methods and Research Design

This was a quantitative study that focuses primarily on an experimental correlational approach. When the grit-building curriculum was employed, using the tenets I outlined above, I examined the effects that the curriculum through a quantitative analysis in a pre- and posttest format. The study first examined whether ninth grade English students completed significantly more essay revisions after receiving the grit-building curriculum than they did before receiving the intervention. The paper revision pre-tests were completed in conjunction with the first essay assignment, which took place before the grit-building curriculum began, and the posttests occurred as the last essay assignment of the unit concluded. Additionally, the study examined whether ninth-grade English students scored significantly higher on the grit self-analysis scale after receiving the grit-building curriculum than they did before receiving it. The pretest grit scale was given before the curriculum was implemented, while the posttest was given after the conclusion of the grit unit. A subsequent research question lies in the ability to establish a connection between grit and task perseverance. For this question, I examined the statistical correlation between Grit-S scale scores and the number of paper rewrites per student. These correlations will examine the correlation between both pre-tests of grit, both post-tests of grit, the change in grit scores, and the change in paper rewrite scores.

Student demographics of the study were as follows (Table 7.1):

Two separate and distinct sets of data were analyzed for statistically significant improvements in the area of grit. The first, the eight-item short grit scale (Grit-S) measures potential change in both the short and long term. The second, the number of paper revisions, indicates a task perseverance as a performance variable with a more practical application to the secondary classroom.

The Grit-S Scale was employed in this experiment because Duckworth and Quinn (2009) found its validity to be higher than the 12-item grit scale. Across four studies, Duckworth and Quinn (2009) found the scale to have an internal consistency range

Table 7.1 Demographic data of the study's participants

Demographic	Gender	Race	Age
	17 (male)	40 (Caucasian)	34 (age 15)
	29 (female)	5 (Latino)	11 (age 14)
		1 A(African-American)	1 (age 13)

of 0.73–0.83 and medium-to-strong predictive validity. Unstandardized regression coefficients associated with grit scores predicted student performance ranging from 0.22 to 0.55, with associated odds ratios ranging from 0.80 to 1.73. Items on the scale were measured using a five-point Likert scale, ranging from "Not at all like me" to "Very much like me." The corresponding point value ranges from 1 ("not gritty at all") to 5 ("extremely gritty"). The point totals for each question are added together and divided by 8, which equates to the mean grit score for all eight items. These scores were rounded to the hundredth and entered into SPSS. Appendix G contains the Grit-S survey taken from Duckworth and Quinn (2009).

Task perseverance was measured using a measure of essay revisions for the pre- and posttest. Each time a student completed the full revision process, this included completion of the "Take Ownership Sheet," the student-teacher conference, and the rewrite turned in with the noted changes and the old copy with associated rubric. When this process was completed, the student was marked as having completed one paper rewrite with the possibility of completing as many as possible to improve their grade on this assignment and overall writing prowess. For each paper revision period, students were also given an eventual time cap of 3 weeks to complete all possible revisions. Though this may seem contrary to the spirit of the unit, in general, teachers still must meet grade period deadlines; thus, an eventual time cap was needed to meet said deadlines.

Students were tested using the two measures outlined above to demonstrate growth from pre- to post-test 6 months later. Both pre-tests were given at the beginning of the grit-building curricular unit, and the posttests were given immediately following the conclusion of the unit. Student information data were coded based on a given number in the order in which students turned in their consent and assent forms to the research assistant. These data codes were then used to enter student information into SPSS to protect student confidentiality throughout the process of this study.

The students in this study were entirely randomized, as they were scheduled into my classes through the administration's selection. Generally, freshman English students are placed into teams (and therefore assigned to designated teachers) based on the alphabetical orientation of their last name.

Every student who stayed in the given English I class for the entirety of the six-month intervention had the opportunity to be a part of this study. Students were excluded if they transferred out of the class because of schedule changes or if they transferred to another school district. This means that all students accounted for experienced the entire unit of instruction and were both pre- and post-tested.

Student data were only analyzed for students who turned in their consent and assent forms to the research assistant before the end of the grit unit, giving informed consent from both the student and his or her guardian to use the data in the study. Data for students who did not complete these forms were destroyed immediately at the conclusion of the study.

All data for this study were analyzed using the SPSS computer program. When comparing the correlation between the results of the paper rewrites and the short grit scale, a Pearson r correlation was employed to establish the relationship between grit

and task perseverance. Additionally, a correlational analysis was used to determine if the grit surveys were significantly tied to paper rewrites as a measure of task perseverance. The same analysis was also used to establish a correlation between the change in Grit-S scores and the change in the number of essay revisions. Even though this is clearly not the main purpose of the study, it is still important to analyze because past research (Gerhards & Gravert, 2015; Lucas et al., 2015; Suzuki et al., 2015; Von Culin et al., 2014) has determined that the two are indeed closely related. To establish the statistically significant improvement in grit scores and paper rewrites from pre- to post-test, a paired sample t-test was used. Finally, a partial correlation coefficient was commissioned to control for the initial grit measure, while also determining the correlation between both posttest measures as well.

7.4 Results

The research questions examined in this study were as follows:

- RQ1: Is there a significant difference between the T1 and T2 number of rewrites?
- RQ2: Is there a significant difference between the T1 and T2 grit scores?
- RQ3: Is there a correlation between the T1 grit score and the T1 number of rewrites?
- RQ4: Is there a correlation between the T2 grit score and the T2 number of rewrites?
- RQ5: Is there a correlation between the change in grit scores (T2 − T1) and the change in number of rewrites (T2 − T1)?
- RQ6: Controlling for initial (T1) grit scores, is there a correlation between the T2 grit scores and the number of T2 rewrites?

Research Question 1 is explored in the table below:

The analysis shown in Table 7.2 shows an r value of .00, with a *p*-value of lower than .05, which means H0 was rejected. In fact, this test provided very strong evidence against the null hypothesis. This indicates that the mean paper rewrites per student after the grit unit intervention was statistically significantly higher than before the grit intervention, $t(46) = -5.51$, $p < .001$ ($r2 = .00$). Students scored higher on the posttest ($M = 1.15$, $SD = 1.17$) than they did on the pretest ($M = .37$, $SD = .57$). The effect size (Cohen's d) was .85.

Research Question 2 is explored in the following table:

Table 7.2 Results of t-test and descriptive statistics for paper rewrites

	Before grit unit		After grit unit			95% CI for mean difference		
Outcome	M	SD	M	SD	n		r	t
	.37	.57	1.15	1.17	46	−1.07, −.50	.000*	−5.51

* p < .05

Table 7.3 Results of t-test and descriptive statistics for Grit-S scores

Outcome	Before grit unit		After grit unit		n	95% CI for mean difference		
	M	SD	M	SD			r	t
	3.41	.57	3.59	.58	46	−.30, −.05	.008*	−2.79

* $p < .05$

Table 7.4 Descriptive statistics: Grit-S pretests and rewrite pretests

	Mean	Standard deviation	*N*
Grit-S pretest	3.42	.57	46
Rewrite pretest	.37	.57	46

Table 7.5 Results of Pearson r correlation: Grit-S pretests and paper rewrite pretests

		Grit-S pretests	Paper rewrite pretests
Grit-S pretests	Pearson Correlation	1	.25
	Sig. (2-tailed)	.	.09
	N	46	46
Paper rewrite pretests	Pearson Correlation	.25	1
	Sig. (2-tailed)	.09	.
	N	46	46

The analysis shown in Table 7.3 shows an r value of .008. The *p*-value was again lower than .05, so H0 was once again rejected. As a result, this proves that the mean grit score per student after the grit-building unit was statistically significantly higher than before the intervention, $t(46) = -2.79$, $p < .05$ (r2 = .01). Students scored higher on the posttest ($M = 3.59$, $SD = .58$) than they did on the pretest ($M = 3.14$, $SD = .57$). The effect size (Cohen's d) was .31.

Research Question 3 asks if there is a significant difference between the T1 grit scores and T1 number of paper rewrites. As previous research has indicated (Gerhards & Gravert, 2015; Lucas et al., 2015), grit scale scores are often statistically correlated with aspects of task perseverance on somewhat menial tasks. This Pearson *r* correlation attempts to connect determination on a more practical classroom task to the Grit-S scale. The descriptive statistics for this correlation are shown below (Table 7.4).

Additionally, the correlational analysis is shown in Table 7.5. The Pearson r correlation represented below does not demonstrate a statistically significant correlation between Grit-S Pretests and Paper Rewrite Pretests, $r = .241$, $p = .088$. Thus, H0 was not rejected. However, the data is approaching significance, which is suggestive evidence against the null hypothesis.

A similar test was necessary to run on the posttests of both the Grit-S scores and the paper rewrites to answer Research Question 4. The descriptive statistics for this correlation are shown in Table 7.6 below.

Furthermore, the correlational analysis is shown in Table 7.7 (below). Again, H0 was not rejected. The Pearson r correlation shown below also does not demonstrate a

Table 7.6 Descriptive statistics: Grit-S pretests and rewrite posttests

	Mean	Standard deviation	*N*
Grit-S posttest	3.59	.58	46
Rewrite posttest	1.15	1.17	46

Table 7.7 Results of Pearson r Correlation: Grit-S posttests and paper rewrite posttests

		Grit-S posttests	Paper rewrite posttests
Grit-S posttests	Pearson Correlation	1	.24
	Sig. (2-tailed)	.	.11
	N	46	46
Paper rewrite posttests	Pearson Correlation	.24	1
	Sig. (2-tailed)	.11	.
	N	46	46

Table 7.8 Descriptive statistics: change in Grit-S and change in rewrites

	Mean	Standard deviation	*N*
Grit-S change	.17	.42	46
Rewrite change	.78	.96	46

Table 7.9 Results of Pearson r Correlation: change in Grit-S scales and change in paper rewrites

		Grit-S change	Paper rewrite change
Grit-S change	Pearson Correlation	1	.14
	Sig. (2-tailed)	.	.37
	N	46	46
Paper rewrite change	Pearson Correlation	.14	1
	Sig. (2-tailed)	.37	.
	N	46	46

statistically significant correlation between Grit-S Posttests and Paper Rewrite Posttests, $r = .241$, $p = .107$.

Research Question 5 asks if there is a significant correlation between the change in grit scores (T2 - T1) and the change in number of rewrites (T2 − T1). Because there was no significant correlation between both sets of pretests and posttests, one may assume that there was also no significant correlation from the difference between the pre- and posttests. Regardless, it was still necessary to run a Pearson *r* correlation to determine if this was indeed true. The descriptive statistics are included in Table 7.8 below.

Again, the correlational analysis shown in Table 7.9 failed to reject H0. The Pearson r correlation shown below also does not demonstrate a statistically significant correlation between the change in Grit-S scales and the change in paper revisions, $r = .135$, $p = .370$.

Research Question 6 asks if there is a correlation between the T2 grit scores and the number of T2 rewrites, after controlling for initial (T1) grit scores. The rationale behind this question is that if students were initially gritty, therefore leaving little

Table 7.10 Descriptive statistics: Grit-S posttests and paper rewrite posttests, controlling for Grit pretest

	Mean	Standard deviation	*N*
Grit-S posttest	3.59	.58	46
Rewrite posttest	1.15	1.17	46
Grit-S pretest	3.42	.57	46

Table 7.11 Results of Partial Correlation Coefficient: posttests when controlling for Grit-S pretest

Control variables			Grit posttest	Rewrite posttest
Grit-S pretest	Grit-S posttest	Correlation	1.00	.25
		Sig (2-tailed)	.	.10
		df	0	43
		Correlation	.25	1.00
		Sig (2-tailed)	.10	.
		df	43	0

room to improve, there might possibly be a stronger correlation between the two posttests. The descriptive statistics for this correlation are reported in Table 7.10 below.

Despite controlling for the Grit-S Pretests, the correlational analysis shown in Table 7.11 failed to reject H0.

The partial correlation coefficient shown below also does not demonstrate a statistically significant correlation between the Grit-S scale posttests and the paper revision posttests, $r = .248$, $p = .101$.

7.5 Discussion

The purpose of this study was to develop and determine effectiveness of a ninth-grade English Language Arts curriculum designed to enhance grit at a rural Midwestern public high school. More specifically, effectiveness was evaluated by determining the relationship between grit and paper rewrites (when students were given unlimited opportunities to complete as many revisions as possible in order to earn higher grades and improve writing skills). For a variety of reasons, paper revisions seemed a valid test of task perseverance, one of which could be reflected through student Grit-S scores. However, statistical analysis of the two failed to establish any significant relationship between the two experimental variables. This is likely because grit is long-term in nature, by definition, and the short-term nature of task perseverance did not coincide. More significantly, however, the study aimed to measure significant growth in both Grit- S scales and paper rewrites. The results did, however, show that both paper rewrite and grit scores did significantly improve throughout the course of this study.

Post-hoc interviews were conducted 3 months post-study to examine the specific effects on 12 of the highest-growth students in each measure of grit. I looked for

thematic connections between students for the specific tenets of the curriculum outlined above to determine which aspects had the most lasting impact on students; this was the primary reason for waiting 3 months after the study ended. Pertinent student quotations have been included in the conclusion section to add qualitative context to the results of the quantitative study.

When interviewing participants post-study, I focused on each individual tenet of the grit-building curriculum to examine which aspects of the curricular changes made had the most impact on students' mentalities. I have coded them based on their initials to retain their confidentiality. After examining their answers, several prominent themes emerged.

When asked about the impact of the grit-themed literature on students, it was clear that the nonfiction had the largest effect. Several students mentioned that the short stories they read had little effect, as they were unable to see themselves in the literature and relate to it. Conversely, most students found value in the nonfiction. More specifically, they commented on the impact of the growth mindset piece. MC made the following comment: "I thought I had a growth mindset before, until we did the survey. I had a fixed mindset. Now, I feel like I have a more growth mindset because I feel like I have time to reach my goals and I don't have to do it the first time." Of those students interviewed, all of them felt that the texts were valuable in some form or fashion. Even one student, AJ, mentioned the poem "Invictus" as being beneficial: "If you really want to do something, you have to work for it. The line, 'I am the master of my fate, I am the captain of my soul.' It really opened my eyes to that." The fact that AJ still remembered that prominent line almost 6 months after studying the poem indicates that it was heavily impactful.

I then moved on to the idea of effort-based feedback and one-on-one conferencing. As a reminder, students were obligated to conference with me before I gave them the opportunity to revise their essays and receive the updated grade for their essays. Several students found the procedure incredibly valuable. PG stated, "You were helping me know what I needed to correct. You kept pushing me to get better and better and better. I understood better by talking than just reading it on my paper." The motif here was that the time spent on the more specific feedback was especially helpful, as exemplified by RD: "Yes because it helped me understand what you expected specifically from me. It helped clarify a lot of things if I didn't understand something. You'd give specific examples." The consensus seemed to be that audio feedback in a face-to-face fashion was more valuable than effort-based feedback, which is unsurprising, especially when coupled with written feedback on the student work samples as well.

Finally, and perhaps most importantly, were the responses to the question about the impact of the unlimited revision policy. Students generally recognized that the policy placed emphasis on the fact that the learning took place rather than when the learning took place. SA, a student who is musically inclined, commented, "I relate it to music and how you don't just pick up an instrument and play it. It takes a lot of work, and that's really what I got from the grit unit. It takes work to be good at any skill." PG added, "The word unlimited made me want to do it this right the first time. I was upset sometimes when I didn't get it right the first time. But I'd just push

myself to make it better; it helped me to know that it didn't have to be right the first time." This, to me, justifies the whole process.

7.6 Practical Implications and Future Directions

The quantitative results showed that the tenets of the grit-building curriculum, including rigor, ownership, effort, goal-setting, feedback, and grit-based literature were effective in their overall goal: to cultivate grit and to cultivate task perseverance in students. This was the main goal of the study and suggests that these methods should be employed in more classrooms across the country to yield similar results.

The purpose of the interviews, in part, was both to determine more specific directions for future research studies and to zero in on the practical implications that one might glean from the study. Given that there were positive aspects to each individual aspect of the grit-building curriculum, it may be beneficial to study each aspect individually. This may help to sort out which alteration was most pertinent in creating the statistical difference between the pre- and post-test on either the task perseverance measure of the Grit-S scale. Clearly, the unit as a whole was effective, but practically speaking, it may be difficult for teachers to implement all aspects at once. Therefore, focusing on the key pieces individually, and then implementing it in stages may be more feasible.

Another clear implication and future direction both would be to make the grit-building curriculum more longitudinal. For the sake of this study, it was a necessity to focus solely on task perseverance, because grit, by nature, is long-term. It would be interesting to see if this curriculum repeated over several years could have a measurable effect on GPA, graduation rate, attendance, or even college admission rates. Perhaps making "grit" a core value of a school, and thus tying most learning back to grit in some manner would have a positive impact on school culture and classroom engagement.

7.7 Conclusion

This study aimed to draw a statistical connection between an intervention designed to improve grit and actual Grit-S self-assessment scales. Additionally, the curriculum attempted to provide a marked improvement in a practical test of task perseverance. Both measures were, in fact, statistically significantly improved. Though the study aimed to provide a statistical relationship between task perseverance and grit, it failed to provide such a correlation.

Paper revisions were used as a measure to test students' task perseverance. In other words, when faced with a difficult task, this test exposed which students would step up to the challenge of putting in effort. It also sought to answer which students would perform this writing task multiple times, if given the adequate opportunity.

Most importantly, it sought to determine if adequate improvements were made in the previous two questions throughout the course of the 6-month study. I hypothesized that pretests in paper revision based on the mean of rewrites completed per student would show significant growth over the course of the six-month grit unit intervention. In reality, based on the paired measures t-test performed in SPSS, paper rewrite production grew quite exponentially, showing an incredibly high statistical significance.

The next hypothesis in this study was that Grit-S scales would significantly increase after the grit unit intervention. Because of the research performed that shows that the Grit-S scale is a strong predictor of success in many different applicable situations, it was important to show that grit is a malleable trait and can be changed with time and effort. Although results were not as strong as the previous hypothesis, students did show statistically significant growth in the eight- item grit scale, based on the average grit score in the same set of students, from before and after the intervention. These results of the paired measures t-test conducted in SPSS proved that this growth was indeed very strong statistically.

The first hypothesis connecting the Grit-S scales to a practical measure of task perseverance showed that the two were not as interconnected as I had assumed initially. Because of research connecting task perseverance on trivial—but statistically measurable—challenges to grit, I sought to tie the Grit-S scale to a more applicable undertaking that many English teachers, and teachers in general, use quite often: task engagement on a writing assignment. It was a venture that students could easily apply to future distal goals, especially since many participants are college-bound students. Despite this encouraging prospect, the null hypothesis was still not rejected for the pretest correlation. Although the results were suggestive that there may have been a connection, they were not closely connected enough to meet statistical standards for correlation.

I also hypothesized that Grit-S scale posttest would be positively correlated to paper revision posttests on the same basis that was mentioned above. However, I was still unable to reject the null hypothesis. This time, the results showed that there was no statistical correlation between Grit-S scales and paper revision tests in the posttest form; not only that, the results were not approaching correlation and did not hint at a statistical relationship.

Though no direct research supported the hypothesis that the change in grit scores would be correlated to the change in paper revision scores, I nevertheless thought it a valuable undertaking to examine these results. The idea here is that if students truly became grittier from the grit-building intervention, this may be reflected in both tests simultaneously. Hence, if students truly improved in their self-perception of grit, reflected by the Grit-S scale score, they might also have demonstrated that grit through the test of task perseverance. Unfortunately, there was again no statistically significant correlation between the change in grit scores and the change in paper rewrite numbers based on the Pearson *r* correlation performed in SPSS. In fact, there was not even suggestive evidence that the two had any statistical relationship whatsoever. Though students statistically improved overall in both measures of

grit and task perseverance, this implies that students more than likely improved in either one test or the other, but not both.

The final hypothesis is an expansion of the posttest correlation evaluated above. I hypothesized that after controlling for Grit-S pretests, there would be a statistically significant correlation between Grit-S posttests and paper revision posttests. Once entering the student data into SPSS and performing a partial correlation coefficient, I was still unable to reject the null hypothesis. This means that there was still no statistically significant correlation between the two posttest measures, even though the data was closer to approaching suggestive evidence of correlation after controlling for the Grit-S pretests.

Overall, this study has helped to establish some groundwork for grit as a malleable characteristic. But like all studies, it needs to be replicated and validated, and I look forward to others in the field making an effort to do so.

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