# GRIT, GROWTH MINDSET, AND DELIBERATE PRACTICE IN ONLINE LEARNING

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## ABSTRACT

*Online education continues to grow in popularity and is an attractive option for individuals of all ages, but particularly for adults who must balance work, family, and school responsibilities. Attrition rates in online courses are high for a variety of personal and institutional reasons. Some of the personal reasons attributed to retention in online courses and degree programs focus on non-cognitive factors related to persistence, a growth mindset, and grit. Prior research has demonstrated that higher grit scores could equate to higher achievement in multiple areas of a person's life–professionally and personally, and in academic settings. However, to mindfully improve retention of online learners, faculty need training and should implement strategies such as deliberate practice, which requires full engagement, repeated attempts at success, openness to taking risks, and reflection on learning and failures. Thus, it makes sense that grit, a growth mindset, and deliberate practice strategies may improve retention of online students. Identifying reasons for high attrition rates in online courses and non-cognitive traits that lead to academic success will offer a foundation for more research to identify ways to increase student persistence in online degree programs.*

## INTRODUCTION

The demographics of educational settings have become increasingly diverse in recent years as non-traditional learners have become the norm for many universities. Online learning is becoming more popular, showing steady increases since 2003 (Allen & Seaman, 2011). One out of seven undergraduate college students attend a fully online program, nearly 80% of graduate students choose online courses, and a majority of online learners are female and employed full-time (Online College Students, 2015). There are a variety of reasons that students choose online programs including: flexible pacing and schedules, work obligations, tuition and fees, and the school's reputation (Best Colleges, 2016). While more adults are accessing postsecondary education and online programs are growing, attrition in these programs is very high. Existing literature reveals multiple personal, professional, and institutional reasons why students drop out. Instinctively, faculty and university leaders believe the most persistent and motivated individuals will persist in courses and programs. Therefore, researchers and academic organizations are giving increasing attention to the non-cognitive trait of grit, which has been tied to retention in programs. This paper will explore the construct of grit as a personal trait and deliberate practice as an instructional intervention that may contribute to the academic success of adult learners in online programs.

### *Attrition in Online Courses*

Distance education tends to attract more mature students who lead busy social and work lives outside of school. However, attrition rates in online

courses are very high, with estimates ranging from a low of 10% (Herbert, 2006) to as high as 40 to 80% (Smith, 2010). Researchers have not identified clear causes explaining why students drop their degree programs; however, many researchers agree that students are more likely to drop out early in the semester or early in their degree programs and do so for a variety of "personal, professional and program-related issues" (Bawa, 2016, p. 8). Kizilcec and Halawa (2015) outlined four reasons why most students did not complete their online courses. These were related to time, the difficulty level of the course, format and content of the course, and individuals' goals and expectations for the course. Thus, the high attrition rates in online courses can be a result of a variety of factors related to institutional and learner characteristics.

*Cognitive Load*

While online programs may be more convenient, many students underestimate the volume of the workload and level of involvement required in online courses (Bawa, 2016). Learners who are accustomed to traditional, face-to-face, courses may lack the subject matter knowledge and technical skills needed to succeed in online environments. They may not be prepared for the fluid structure of online classes and become frustrated or even unmotivated to learn (Bawa, 2016; Bradford, 2011). Online learning requires self-direction and self-discipline. Many online courses follow a constructivist model, leaving learners to their own devices to solve complex problems and build their own knowledge. Students who lack initiative and the ability to construct knowledge on their own, may experience demotivation and subsequently quit either their course or degree program (Bawa, 2016). Managing cognitive load may help students process information at a pace that will increase persistence.

Additionally, online courses often contain a large amount of information learners are required to process before meaningful learning can begin. Individuals cannot hold or store large amounts of information in their short-term or working memory, therefore exceeding their cognitive load. In other words, students simply cannot digest the large amount of information presented in the courses (Paas, Renkl, & Sweller 2004). To ensure academic success, online learners must be prepared to acclimate to the online learning environment by becoming self-directed and prepared to process large amounts of information. Likewise, instructional designers must be prepared to design courses that meet learners' needs. Moreover, faculty must be equipped to offer learners with the help they need processing information to avoid cognitive overload (McQuaid, 2009). Persistence or grit may help students stay enrolled in programs and achieve their dream of getting a degree. Teaching strategies that foster grit may help faculty improve retention rates, both in terms of degree completion and for retaining course material studied.

## CONSTRUCT OF GRIT

Students must possess or develop the personal characteristics needed to persist and succeed in the dynamic and fluid nature of online courses and programs. One attribute that may contribute to learner success is grit, which is defined as passion and perseverance for long-term goals (Duckworth, Peterson, Matthews, & Kelly, 2007). Grit is the quality of working persistently and consistently toward long-term goals, despite failures, challenges, and/or highs and lows in the process. Gritty people view success and achievement of goals as a process, or marathon, and view stamina as their competitive advantage (Duckworth, et al., 2007). Non-cognitive factors such as grit, coupled with motivation, may improve faculty and student retention in postsecondary education.

Grit has been shown a predictor of success, academic achievement (Duckworth & Quinn, 2009; Perkins-Gough & Duckworth, 2013), and metacognition (Arslan, Akin, & Citemel, 2013). Specific to online education, grittier doctoral students invested more time in studying each week and had higher grades (Cross, 2014). Developing grit in online students may increase the likelihood of better grades, stronger focus, and ultimately greater success in completion of an online education.

While high levels of grit do not necessarily predict equal engagement of passion and perseverance in all pursuits of life, grit has shown to be a valid measure for success and achievement in dominant long-term goals (Duckworth & Gross, 2014). Duckworth (2016) argued that grit is a greater predictor of success than talent and emotional intelligence; however, one cannot pursue

becoming a great musician and at the same time a great reader, a great runner, a great cook, and a truth-seeker. Being gritty means one pursues a passion, not multiple passions, with consistent interest and sustained effort over a long period of time (Duckworth et al., 2007; Duckworth & Quinn, 2009). Grit requires a level of self-discipline; however, it is important to recognize that grit is not the same at self-discipline.

*Grit Versus Self-Discipline*

Maintaining consistency and effort alone should not be confused with possessing self-discipline. Some people use the terms grit and self-discipline interchangeably; however, there are important distinctions between the constructs. Prior to the conception of the construct called "grit," Duckworth and Seligman (2005) conducted a longitudinal study of 140 eighth-grade students measuring self-discipline (i.e. self-control) and academic performance, with assessment measures taken in the fall and in the spring. The following year, the study was replicated with 164 eighth-graders, with added measures of IQ. Measures of IQ and self-discipline were taken in fall, and again in the spring. Self-discipline measured in fall accounted for more than twice as much variance as IQ in final grades in spring. Duckworth and Seligman (2005) determined self-discipline to be a stronger predictor of academic performance than IQ. In short, self-discipline was noted an important predictor of success in academic settings. Building on these findings, researchers studied self-control and grit to determine potential correlations predictive of success and achievement.

A recent study by Duckworth and Gross (2014) on self-control (i.e. self-discipline) and grit, found the constructs strongly correlated—yet distinctly different. That is, individuals who score high in self-control resist temptations, but are not necessarily able to pursue a desired and dominant goal. Likewise, individuals high in grit may succumb to temptations unrelated to a chosen passion of pursuit, but may be able to pursue a dominant goal. Self-control requires aligning actions to a desired goal without momentarily yielding to distractions. In contrast, grit involves working persistently toward a single, challenging superordinate goal over a time span of years or even decades. For instance, when a gritty individual encounters a setback or obstacle to a goal, a superordinate goal impels that person to create new lower order goals (actions) to supersede the obstacle blocking the goal. In other words, when encountering an obstacle or unattainable goal, a gritty individual will identify a viable alternative to achieving that goal (Duckworth & Gross, 2014). Duckworth and Gross (2014) acknowledged that both self-control and grit require aligning actions with intentions, and stressed the importance of understanding different types of desired goals and time tables involved. Clarification between the constructs of grit and self-control is important to understanding grit as a predictive measure of academic success and achievement. Self-control is not the same as grit.

*Studies On Grit*

Duckworth et al. (2007) conducted two seminal studies on the construct of grit. The researchers developed the original 12 item Grit-O scale using a large sample of adults over the age of 25 while subsequently studying whether grit increased with age. Results of this initial study revealed that grit was associated with higher levels of lifetime schooling among individuals of the same age. The researchers collected self-report data on education level and grit scale measures from 1,545 participants who were 25 years of age and older. Results of an analysis of variance showed that more educated adults had higher grit scores than their less educated peers. When controlling for age, results showed that post-college graduates had higher grit scores than their peers in other groups. Adults high on grit and over the age of 24 tended to attain higher degrees than those with grit scores one standard deviation lower (Duckworth et al., 2007; Duckworth & Quinn, 2009). Thus, Duckworth et al. (2007) found that grit tended to be higher in older adults and based this not only on study data, but also on the premise that life experience, persistence, and diligence contributed to one's grit, or passion for long-term goals.

Duckworth and Quinn (2009) conducted a quantitative study seeking to test the predictive validity of the shorter 8-item Grit-S scale for purposes of retention of West Point cadets. The sample included 1,248 freshmen cadets in their first summer training program. Upon entering the summer program, the cadets completed the Grit-S, Grit-O and were also rated with the Whole

Candidate Score (WCS), a compilation of high school rank, SAT score, extracurricular activities, and a standardized physical evaluation on a weighted composite. The dependent variable for this study was summer retention: 1 = retained, 0 = separated, and the independent variable was grit scores. Findings determined grit was a stronger predictor of success than the Whole Candidate Score. Students who scored one standard deviation higher than average on the Grit-S were much more likely to finish summer training (Duckworth et al., 2007). A regression analysis revealed Grit-S was a strong predictor of summer retention over the WCS. Though the study was conducted to measure retention, inferences can be made that satisfactory level of academic success and achievement was also gained. Similar to Duckworth and Quinn (2009), Eskreis-Winkler, Shulman, Beal, and Duckworth (2014) determined military candidates high in grit were more likely to succeed in Army Special Operations Forces (ARSOF) training than candidates with lower grit scores. In summary, students' high in grit may be stronger candidates for retention and success.

*Grit and Academics*

Prior research conducted in education settings revealed that academic achievement is based on a combination of an individual's cognitive abilities and personality traits (Bazelais, Lemay & Dolek, 2016). Similarly, prior research has shown grit a predictor of success for students in K-12 (Duckworth & Quinn, 2009) and postsecondary education settings (Cross, 2014; Duckworth et al., 2007). Elementary, junior high, high school, and college students with higher grit scores were shown to have higher grades and a greater likelihood of graduating (Duckworth et al., 2007; Duckworth & Quinn, 2009). These findings suggest learners enrolled in online courses may have similar results.

Eskreis-Winkler et al. (2014) conducted a study on high school students to determine if there was a relationship between grit and retention. Predictors for graduation were gender, race, socioeconomic status, school safety, and support by peers and teachers. The evaluation period for the participating students went from their junior year through senior graduation. Results found grit was correlated to retention, with results holding when controlled for additional factors (Eskreis-Winkler et al., 2014).

Another academic study measured grit of 175 finalists in the 2005 Scripps National Spelling Bee along with verbal IQ and self-control to measure predictability (Duckworth et al., 2007). The study concluded grittier students realized greater success in the spelling bee due to putting in more study hours than their less gritty peers. The study also suggested that grit was a stronger predictor of success than self-control (Duckworth et al., 2007). Final round prediction was better predicted by verbal IQ than grit (Duckworth et al., 2007). Grit is a sound measure of retention and success, as well as perseverance toward academic success.

Additionally, Cross (2014) conducted a study to measure grit in doctoral students enrolled in online courses. His findings suggested significant relationships between grit and GPA, grit and the amount of time spent studying, and grit and age. The implications are that grit may increase throughout life due to experiences and education, grittier individuals may put more effort into their education, and grittier students may have better results in traditional and non-traditional settings. While the literature on grit is still expanding, the current literature supports that people of varying ages and high grit were shown to have higher educational achievement.

Although previous research indicated grit a predictor of achievement in areas of academia, military, and the workplace, it is important to note that some research suggested grit is an insufficient indicator of overall success (Bazelais, Lemay, & Doleck, 2016; Dumfart & Neubauer, 2016; Ivcevic & Brackett, 2014). Dumfart and Neubauer (2016) conducted a study of 498 eighth graders to determine if noncognitive traits had incremental validity over cognitive skill and conscientiousness. Results indicated adolescents high in grit performed slightly better in academics, but conscientiousness was the more important factor, of which grit is one component. Additionally, Bazelais et al. (2016) investigated the impact of grit on the academic performance of freshmen physics students and found students' previous academic performance was a significant predictor of college performance and in physics. However, grit was not a predictor of academic achievement or course grades.

Grit may be a better indicator of success in high-level goals, which are narrow and selected by

the individual, such as an extracurricular activity. However, broader traits, such as conscientiousness from the Big Five Inventory, may be better predictors of overall success in areas such as school in general (Ivcevic & Brackett, 2014), even though grit has been shown to correlate with conscientiousness in a number of settings (Duckworth & Quinn, 2009; Eskreis-Winkler et al., 2014; Kelly, Matthews, & Bartone, 2014; Maddi, Matthews, Kelly, Villarreal, & White, 2012). These findings align with Duckworth (2016) in suggesting that being gritty means to pursue one specific passion, not multiple passions, with consistency of interest and sustained effort over a long period of time. It is possible that attaining a specific education type and level are lower-level goals leading into a higher-level goal (Duckworth 2016). This could explain why individuals with higher grit scores have shown to perform better academically than peers with lower grit scores.

Grit is a non-cognitive trait associated with long-term persistence and passion. Many individuals who are cognitively gifted will seek to earn an A or A- and will not have to try as hard as other individuals. Consequently, some students reach a certain level of proficiency and stop once they achieve the desired grade or goal. However, gritty people consistently try to maximize their outcomes and strive to always do their best, not focusing on limits, ceilings and/or thresholds. Instead, talented and gritty individuals are discontent with only a good grade; they seek to learn, understand, and succeed as much as possible (Duckworth, 2013). Most faculty members and teachers have experienced learners who are gifted, yet struggle with any type of failure. Gritty learners persevere in spite of obstacles, determined to succeed no matter the hurdle. Consequently, cognitive ability alone does not always mean one will be successful in academic pursuits, particularly post-secondary pursuits.

## GROWTH MINDSET

Intelligence and grit are not traits that one is necessarily born with; these traits can be recognized and developed, as well. However, to develop grit, one must embrace a growth mindset (Duckworth, 2013; Dweck, 2013). Individuals who have a growth mindset believe talent can be developed through hard work, mindful strategies, and applying feedback from others. They consistently try new approaches and view failure as a momentary setback and opportunity to grow. Unlike most gifted individuals, growth mindset individuals are typically more focused on learning and improving and less worried about "looking smart" and earning high grades. Applied to online learning and cognitive overload, students who embrace a growth mindset and grit will view the fluid structure of the course and need for self-direction as a challenge to be overcome, rather than a barrier leading to failure. However, Dweck and Duckworth assert that grit and a growth mindset must also be recognized and developed. Therefore, faculty need to cultivate this trait among students in addition to delivering content knowledge.

Growth mindset is grounded in the view that one's abilities are not set. In other words, individuals can develop cognitive skills through practice, training, and a clearly structured method (Dweck, 2015). Effective faculty members facilitate a growth mindset by creating a safe, secure environment where students can learn and engage in deliberate practice without fear of failure (Bromley, 2014). Deliberate practice was designed as an instructional practice to show learners the benefits of "effortful" practice as they work to develop skills. Deliberate practice is meant to explicitly improve one's skills, with an instructor's help, and requires that the individual expend complex, concentrated effort, combined with proper training and feedback, for an extended period of time (Colvin, 2010).

Deliberate practice can be incorporated into instruction in various ways. There is not one "magic bullet" for designing this type of practice, but strategies have been developed that can facilitate the use of deliberate practice in the classroom and beyond. A model may lend some clarity to the process.

*Step 1: Identify an exemplar of effectiveness*

The first step to developing a model for deliberate practice includes identifying exemplars, templates, or instructional aides that outline and demonstrate criteria for success (Pelley, 2013). Additionally, faculty should provide clear instructions and criteria for performance. When students know the criteria for achievement up front, and those do not change, then the probability for success improves.

*Step 2: High expectations*

A second step for a model of deliberate practice includes establishing high, yet realistic expectations (Pelley, 2013). To facilitate success, students should be encouraged to set goals and then act on them. However, those goals should be realistic and attainable so that frustration does not set in. Additionally, students should know that the instructor or faculty member believes in their efforts and ability. Finally, students should be encouraged to always look to the next level of performance (Bromley, 2014), to exercise continual improvement.

*Step 3: Engage in focused and targeted practice*

Accomplished performers practice for over 1000 hours each year, and it takes about 10 years (e.g., 10,000 hours of practice) to reach "world class status" (Gladwell, 2008). Therefore, students must realize that developing skill takes time and effort. Instructors should allow multiple opportunities for students to learn, practice, and show what they know (Bromley, 2014). Offering a variety from two specific types, allows learners to select practice options that appeals to their preferences.

Two kinds of practice increase student success: distributed practice and interleaved practice (Bromley, 2014). Distributed practice includes a set of scheduled activities over time and helps students improve problem-solving skills, since they are not "cramming" practice into shorter sessions or periods of time (Bromley, 2014). Practice is effective when students are engaged in frequent, short sessions spaced out over periods of time. Effective practice also includes differently structured problems within one instructional session. For the online learner, this can be accomplished through weekly assignments, asynchronous or synchronous sessions with other students and the faculty member.

Interleaved practice includes a mixture of problems within one instructional or study session (Bromley, 2014). Students complete problems that have similar structures, but different surface features. This allows them to identify relevant and irrelevant information and to transfer knowledge to different situations and settings (Brabeck, Jeffrey, & Fry, 2017). This type of practice helps students remember information over longer periods of time and transfer information into their long-term memory. These sessions can be maximized when instructors activate students' prior knowledge and experiences in the online environment through weekly guidance, announcements, and/or classroom assessments.

Faculty should design practice tasks based on students' prior knowledge. This links back to the premise discussed earlier that goals should be high, but realistic. The same applies to practice. The problems or activities should keep learners on their "mental tiptoes," but should not be too difficult that they cannot be solved. In order to maximize the benefits of practice, students should be able to succeed. When problems are too difficult, are poorly designed or are unrealistic, students lose motivation, tend to get frustrated, and may not attempt the tasks (Brabeck et al., 2017). As previously mentioned, classroom assessments are a good tool to use in the online environment to gauge student understanding of content, frustration level and stress. A simple strategy is to post a closing thread to the weekly discussion, labeled as "Muddy and clear." The students post what content is clear in their minds and what content needs to be clarified. This can serve as an assessment, but also an opportunity for instructor feedback.

Prior to allowing students to engage in independent practice, the faculty member should model the problem-solving process students will be asked to use. Guiding students through example problems with instructional prompts encourages reflection of the steps used in solving problems. Additionally, students should be given ample opportunity to practice skills before tests (Brabeck et al., 2017). Reviews and tests are ways to engage students in practice to improve learning outcomes as well. Open-ended questions require students to access working memory and retrieve information. These two methods are reviews effective when effectively crafted to measure learning objectives, strategically spaced and frequent (Brabeck et al., 2017). In the online environment, faculty members can use podcasts and short videos to model or explain problems or content for the current week. This can significantly reduce student apprehension and encourage engagement with the content.

Chunking information by breaking difficult problems into basic parts also helps students transfer content to long-term memory (Brabeck et al., 2017). Chunking allows learners to compress up to eight units of information into one meaningful

unit or "chunk" (Brabeck et al., 2017). Students practice small steps of a larger problem and work up to completing an entire whole. As mentioned earlier, exemplars help students identify criteria for success. Thus, giving students sample problems will help provide the extra scaffold or guidance they need to successfully complete the task at hand. Finally, instructors should give students just enough information to begin to solve the problem, waiting until they need more information to undertake the next step. This is referred to as "just-in-time instruction" and helps manage the amount of information students have to store in working memory during practice sessions (Brabeck et al., 2017).

*Step 4: Provide detailed formative assessment feedback*

Clear and detailed feedback is also important to providing students with information on their efforts and skills. Feedback should not be reserved until the end of an instructional episode. Rather, it should be consistently provided during the learning process to give students timely information on their progress toward desired learning outcomes. Feedback needs to be clear and outline exactly what students are doing well and what they need to improve (Brabeck et al., 2017). Online faculty can use the track change function and comment feature in Microsoft Word to provide detailed feedback on assignments. Additionally, interacting with students live through videoconferencing software, such as Zoom, can allow the faculty member to meet individually with students and post the paper so both can review and dialogue about needed changes in a live session. Zoom also has a recording feature so the session can be recorded and reviewed by the student at a later date.

Reflection is part of the feedback process and should be built into class time to ensure students think on their progress. Closing announcements for each online course week can post a review of content taught and reflection questions for the learner. Additionally, discussion questions can be posted to allow learners to summarize feedback, evaluate on their progress and ask clarifying questions. During feedback, the instructor or faculty member should praise students on the effort expended rather than what they attain (Dweck, 2015). This includes pointing out how students improve their work during iterative processes. This helps students focus on the more important process of learning, rather than attaining a certain grade.

*Step 5: Reflect, observe and communicate*

A final step to the deliberate practice process includes reflection, observation, and communication of progress. Individuals who engage with others and incorporate feedback into their practice will yield more meaningful improvement than those who work alone and do not collaborate (Marzano, 2013). Teachers can provide students with questions to guide reflection. This "strategy instruction" helps students learn more about how they learn, which in turn, helps them with new learning. Additionally, faculty members can learn during the feedback and reflection process as well, making adjustments to fine tune their instruction for the next time they teach the concept or guide students through deliberate practice. Brookfield's (1995) Critical Incident Questionnaire can be a tool used for student reflection and faculty insight. The questionnaire outlines five questions for students to answer:

1. At what moment in the class this week did you feel most engaged with what was happening?
2. At what moment in the class this week did you feel most distanced from what was happening?
3. What action that anyone (teacher or student) took in class this week did you find most affirming and helpful?
4. What action that anyone (teacher or student) took in class this week did you did most puzzling or confusing?
5. What about the class this week surprised you the most? (This could be something about your own reactions to what went on, or something that someone did, or anything else that occurs to you. (Brookfield, 1995)

The CIQ can be posted at the end of an online course week to allow students to reflect on their progress, but also to provide the instructor with information on how instruction may need to be adjusted in upcoming weeks.

In academic settings, deliberate practice is facilitated by the faculty member who guides practice, provides meaningful and immediate feedback, and then repeats the cycle over and over. Praise is key in that it focuses on keeping learners

engaged in producing hard work and effort that leads to results and achievement (Dweck, 2015). Additionally, deliberate practice requires that the faculty member scaffold instruction, chunking information and breaking it down into manageable pieces to avoid cognitive overload. Over time, the instructor guides the learner to combine pieces into a complicated whole. Engaging in deliberate practice also requires passion and grit as individuals cannot be afraid to take risks and make mistakes.

Only through reflecting on mistakes and setbacks can one learn. Accurate and timely feedback is also important to deliberate practice, as students must be able to repeat the task or assignment correctly to progress and master a skill. In other words, the feedback must be specific and targeted so the learner knows exactly how to move forward. Dweck (2015) asserted deliberate practice aligns with a growth mindset in that it requires individuals to stretch beyond their current capabilities, identifying areas of needed development, but also sustaining correct performances.

In summary, online education continues to grow in popularity and is an attractive option for individuals of all ages, but particularly for adults who must balance work, family and school responsibilities. Attrition rates in online courses are high for a variety of personal and institutional reasons. Some of the personal reasons attributed to retention in online courses and degree programs focus on non-cognitive factors related to persistence, a growth mindset, and grit. Prior research has demonstrated that higher grit scores could equate to higher achievement in multiple areas of a person's life–professionally, personally, and academically. However, to mindfully improve retention of online learners, faculty need training and should implement strategies such as deliberate practice, which requires full engagement, repeated attempts at success, openness to taking risks, and reflection on learning and failures. Thus, it makes sense that grit, a growth mindset, and deliberate practice strategies may improve retention of online students.

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