

A Study on Grit Among MBA, MBBS and Engineering Students

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I. INTRODUCTION

Grit in psychology is a positive, non-cognitive trait based on an individual's passion for a particular long-term goal or end state, coupled with a powerful motivation to achieve their respective objective. This perseverance of effort promotes the overcoming of obstacles or challenges that lie within a gritty individual's path to accomplishment, and serves as a driving force in achievement realization. Commonly associated concepts within the field of psychology include "perseverance", "hardiness", "resilience", "ambition", "need for achievement" and "conscientiousness". These constructs can be conceptualized as individual differences related to the accomplishment of work rather than talent or ability (Galton Francis, 1892). This distinction was brought into focus in 1907 when William James challenged the field to further investigate how certain individuals are capable of accessing richer trait reservoirs enabling them to accomplish more than the average person, but the construct dates back at least to Galton, and the ideals of persistence and tenacity have been understood as a virtue at least since Aristotle.

Grit is defined as "*perseverance and passion for long-term goals*" (Duckworth, A.L., et.al, 2007). Building upon biographical collections of famous leaders in history, researchers and scientists have reached similar conclusions about high achieving individuals. Specifically, those individuals who were deemed more successful and influential than their contemporary counterparts typically possessed traits above and beyond that of normal ability (Duckworth, A.L., et.al, 2007). While ability was still critically important, these individuals also possessed "zeal" and "persistence of motive and effort."

Duckworth and colleagues (2007) believe this dual-component of grit to be a crucial differentiator from similar constructs. Grit is conceptualized as a stable trait that does not require immediate positive feedback. Individuals high in grit are able to maintain their determination and motivation over long periods despite experiences with failure and adversity. Their passion and commitment towards the long-term objective is the overriding factor that provides the stamina required to "stay the course" amid challenges and set-backs.

According to Duckworth, A.L. (2007), Grit isn't a talent. Grit isn't a luck. Grit isn't how intensely, for the moment, one want something. Instead, grit is about having what some researchers call an "ultimate concern"- a goal he/she care about so much that it organizes and gives meaning to almost everything you do. Grit is holding steadfast to that goal. Even when he/she fall down, even when he/she screw up, even

when progress towards that goal is halting or slow. Angela Duckworth also defines grit as "not just resilience in the face of failure, but also having deep commitments that one remain loyal to over many years" and argues that it can be a better predictor of long-term success than cognitive ability.

While Duckworth and other researchers (2007) have developed a series of psychometric scales measuring grit in children and adults, it is also important recent research into grit and how it can mean different things to different people. Researchers have identified two main components of grit- "*perseverance of effort*" and "*consistency of effort*". Perseverance of effort refers to the *tendency to work hard even in the face of setbacks while consistency of effort means sticking to a specific goal, for years if necessary, without changing to a new goal that might seem more attainable*. Both perseverance and consistency are vital elements of the drive to succeed.

The primary scientific findings on grit came from Duckworth and colleagues' examination of grit as an individual difference trait capable of predicting long-term success. It was proposed that individuals who possess a drive to tirelessly work through challenges, failures, and adversity to achieve set goals and are uniquely positioned to reach higher achievements than others who lack similar stamina. In a series of six studies Duckworth et al. proposed, developed, and tested a two-factor grit scale with notable results.

In addition to validating their grit scale, the authors also found support suggesting that grit provided incremental predictive validity for education and age above and beyond the Big Five personality traits - Duckworth, A.L. et.al (2007); that higher levels of grit were more highly associated with cumulative grade point average (GPA) in an Ivy league sample when compared to those with lower grit levels; that grit predicted retention after their first summer in two classes of cadets at the United States Military Academy – and that participants in a National Spelling Bee with higher grit scores typically work harder and longer than less gritty peers, ultimately resulting in better performance. This series of studies provides empirical evidence that an individual difference conceptualized as grit can account for significant variance in performance across a variety of settings. Although it was argued that grit predicted beyond the typical and unrelated cognitive construct of IQ and the Big 5 personality construct of conscientiousness these claims were later called into question by a meta-analysis.

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Duckworth and Quinn (2009) found additional support for the grit construct when they developed and validated a more condensed version of the Grit Scale (Grit-S) by removing four of the previous items and improving its psychometric properties. Re-using samples from the data collected, Duckworth and Quinn (2007) found similar results for the relationship between grit and educational attainment, retention in college, and success in a national spelling bee competition. Terrell L. Strayhorn (2013) in another study to test the importance of a non-cognitive trait (Grit), to predicting grades for a sample of Black males attending a predominantly White institution. Results suggest that grit is positively related to college grades for Black males, and the background traits, academic factors.

Crede, et.al (2016) conducted a meta-analytic synthesis of prior empirical research on grit and summarized data from 88 independent samples and over 66,000 individuals and found that grit is only weakly related to success and almost identical to the personality trait known as conscientiousness. It is also concluded that the contribution of grit to the prediction of success is very limited; combination of passion and perseverance into an overall grit construct could not be justified.

Traditional constructs in this area include perseverance and need for achievement. Perseverance is the steadfast pursuit of a task, mission, or journey in spite of obstacles, discouragement or distraction. In contrast, grit is argued to be a trait of perseverance. Grit enables an individual to persevere in accomplishing a goal despite obstacles over an extended period. When compared with the construct of persistence, grit adds a component of passion for the goal. This goal passion also contributes to the ability of the individual to sustain effort over the long term.

Wolters., & Hussain (2014) investigated grit and its relations with college students' self-regulated learning (SRL) and academic achievement. Results show that students' engagement in SRL may serve as a mediating pathway through which this aspect of grit is associated with improved academic outcomes. In contrast, consistency of interest showed no relation to achievement.

Grit is much more than just encouraging kids to "try harder" or not give up—it's also about helping kids find their passion. Having grit does not mean never quitting—it means quitting responsibly (and not just because times get tough) and sticking to the things to which you are truly dedicated. Culin et.al (2014) found that individual differences in grit may derive in part from differences in what makes people happy.

Grit is a combination of passion and persistence. Demonstrating grit could involve:

- Finishing what you begin
- Staying committed to your goals
- Working hard even after experiencing failure or when you feel like quitting
- Sticking with a project or activity for more than a few weeks

Grit can be predictive of achievement, especially in challenging contexts in which stamina is key. In particular, grit predicts achievement in really challenging and

personally meaningful contexts. Grit is the tendency to sustain interest in and effort toward very long-term goals. Self-control is the voluntary regulation of behavioural, emotional and attentional impulses in the presence of momentarily gratifying temptations or diversions.

Maddi et.al (2012) examined the role of hardiness and grit in predicting performance and retention of USMA cadets. Findings suggests that hardiness and grit predicted unique variance in first year retention, but only hardiness predicted first year performance at USMA. These findings suggest that hardiness assessment and training may prove valuable in enhancing performance and retention within military training environments.

II. CHARACTERISTICS OF GRIT

(Duckworth et al, 2007)

Characteristics of grit include:

- Courage
- Conscientiousness: Achievement oriented vs Dependable
- Long-term goals and endurance
- Resilience: optimism, confidence and creativity
- Excellence vs perfection

III. COURAGE

While courage is hard to measure, it is directly proportional to one's level of grit. More specifically, one's ability to manage fear of failure is imperative and a predictor of success. The supremely gritty are not afraid to tank, but rather embrace it as part of a process. They understand that there are valuable lessons in defeat and that the vulnerability of perseverance is requisite for high achievement. Silvia et.al (2013) examined grit and effort-related cardiac autonomic activity during an active coping challenge. Findings illuminate autonomic processes associated with how "gritty" people pursue goals, and they suggest that more attention should be paid to the facets' distinct effects.

Hochanadel, A., & Finamore, D. (2015) researched fixed and growth mind-set in education and how grit helps students persist in the face of adversity. This study explored researched competencies related to persistence in reaching academic goals, review literature in grit and growth mind-set related to learning and persistence, and examine what educators can do to foster grit and a growth mind-set. The study concluded that having a "growth mind-set" could develop grit; identifying explanatory style using the grit assessment is one way to determine where students can put their efforts to learn to persist in the face of academic challenges.

IV. CONSCIENTIOUSNESS

Achievement Oriented Vs Dependable

According to Duckworth (2007), of the five personality traits, conscientiousness is the most closely associated with grit. Conscientiousness in this context means, careful and painstaking. The achievement oriented individual is one who works tirelessly, tries to do a good job and completes the task at hand, whereas the dependable person is more notably

self-controlled and conventional. A self-controlled person who may never step out of line may fail to reach the same heights as their friends. In other words, in the context of conscientiousness, grit, and success, it is important to commit to go for the gold rather than just show up for practice.

V. LONG-TERM GOALS AND ENDURANCE

Duckworth (2007) show that one of the distinctions between someone who succeeds and someone who is just spending a lot of time doing something is this; practice must have purpose. That's where long term goals come in; they provide the context and framework in which to find the meaning and value of your long-term efforts, which helps cultivate drive, sustainability, passion, courage, stamina.

Bowman et.al (2015) explored grit dimensions to be differential predictors of educational achievement, satisfaction, and intentions. Results indicated that perseverance of effort predicted greater academic adjustment, college grade point average, college satisfaction, sense of belonging, faculty–student interactions, and intent to persist, while it was inversely related to intent to change majors. Consistency of interest was associated with less intent to change majors and careers, but it was not significantly associated with any other outcome in the expected direction when controlling for other variables.

Duckworth et.al (2011) investigated Deliberate Practice Spells Success; in a longitudinal study to understand how children improve in an academic skill. Deliberate practice mediated the prediction of final performance by the personality trait of grit, suggesting that perseverance and passion for long-term goals enable spellers to persist with practice activities that are less intrinsically rewarding—but more effective—than other types of preparation.

VI. RESILIENCE

Optimism, Confidence and Creativity

Resilience is a dynamic combination of optimism, creativity and confidence, which together empower one to reappraise situations and regulate emotion- a behavior many social scientists refer to as “hardiness” or “grit”.

Andrew Zolli (2012) defines resilience as the “ability of people, communities and systems to maintain their core purpose and integrity among unforeseen shocks and surprises”. Kleiman et.al (2013) examined whether gratitude and grit indirectly reduced the risk of suicidal ideations by enhancing meaning in life. Findings illustrated the importance of examining co-occurring personality factors as well as the mechanisms of these factors that can confer resiliency to suicide.

Zolli takes it even further and explains that “hardiness” is comprised of threteenets:

- The belief one can find meaningful purpose in life
- The belief that one can influence one’s surroundings and the outcome of events
- The belief that positive and negative experiences will lead to learning and growth

A key component of grit is resilience; resilience is the powering mechanism that helps to persevere despite whatever obstacles a person face along the way. In other words, gritty people believe, “everything will be alright in the end and if it is not alright, it is not the end”.

VII. EXCELLENCE Vs PERFECTION

Gritty people don’t seek perfection, but instead strive for excellence (Duckworth et al, 2007). In general, perfection is someone else’s perception of an ideal and pursuing it is like chasing a hallucination. Anxiety, low self-esteem, obsessive compulsive disorder, substance abuse and clinical depression are only a few conditions ascribed to “perfectionism”.

Excellence is an attitude, not an endgame. Excellence is bound with the notion of fulfillment of purpose or function and is closely associated with virtue. It is far more forgiving, allowing and embracing failure and vulnerability on the ongoing quest for improvement. It allows for disappointment and prioritizes progress over perfection. Like excellence, grit is an attitude about seeking, striving, finding and never yielding.

Suzuki., et.al (2015) examined previously un-investigated questions regarding grit using a cross-sectional design among a large number of working adults in Japan. Result shows that grit was a strong predictor for work performance as well as academic performance. Lucas., et.al (2015) in a parallel study found that gritty individuals are more willing to risk suffering monetary loss to persist.

VIII. OTHER CHARACTERISTICS

Grit is related to two other characteristics– self-control and conscientiousness. Someone demonstrating high self-control or high conscientiousness is also likely to score high in grit. Grit predicts achieving challenging goals even when these other characteristics are held constant (Duckworth et.al, 2007). These include the commitment to finish what you start, to rise from setbacks, to want to improve and succeed, and to undertake sustained and sometimes unpleasant practice in order to do so.

IX. USES OF GRIT SCALE

Grit (comprising a person’s perseverance and passion) is among the most important predictors of success and that we all have the power to increase our inner grit. The grit scale is useful as a prompt for self-reflection. The distortion of scores comes from people holding different standards by which they judge behavior. So, the score reflects not only how gritty a person is, but also the standards to which he/she hold to oneself. The Grit scale can be used for research and for self-reflection, but its limitations make it inappropriate for many other uses, including selecting employees, admitting students to college, gauging the performance of teachers or comparing schools or countries to each other.

X. NEED FOR THE PRESENT STUDY

The career world is changing so fast that grit has also become a sought after competency for hiring and a necessity for entrepreneurs and innovators. Grit is defined as firmness of

mind or spirit - an unyielding courage in the face of hardship. The emerging research indicates that grit can determine success or achievement far better than grades, credentials or professional pedigree. Grit is often undervalued in business and in most of the profession, because businesspeople like breakthroughs, which are good ideas that one may have next week. Grit is tough because one don't get the psychic payoffs that come with an exciting discovery or a shift in direction.

Millenials generally refers to the generation of people born between the early 1980s and the early 2000s. They tend to be open-minded, confident, self-expressive, liberal, upbeat and receptive to new ideas and ways of living. Few other questions raised about them are: Why do they keep changing their minds about what they want to do with their lives? Why does even a hint of critical feedback send them into a tailspin of self-doubt?

All the above questions connect back to one point – Grit level. Several studies found that GRIT is essential trait to be ingrained in professionals to increase their hardiness resilience, making critical decisions, handling tough teammates, reduce the attribute rate and burnout. It was also found that doctors, engineers, and professional experience burn out a lot, and this gave birth to the present research work. Understanding the grit level of engineering, medicine, and MBA students would help in supporting them being grittier.

Eskreis et.al (2014) examined the grit effect in predicting retention in the military, the workplace, school and marriage. Findings suggest that in addition to domain-specific influences, there may be domain-general individual differences which influence commitment to diverse life goals overtime.

Duckworth et.al (2007) in a study to find whether achievement of goals entails talent; it was found that the achievement of difficult goals entails not only talent but also the sustained and focused application of talent over time.

Kamlesh and Jha S., D. (2008) explored positive and negative affect, and grit as predictors of happiness and life satisfaction. Results revealed that grit, positive affect, happiness and life satisfaction are significantly positively correlated. Negative Affect showed a significantly negative correlation with grit, happiness and life satisfaction.

XI. RESEARCH METHODOLOGY

Objectives

- To measure the level of grit among MBA students
- To measure the level of grit among MBBS students
- To measure the level of grit among ENGINEERING students

XII. TOOL USED

1. Socio Demographic Data
2. Grit scale (Angela L. Duckworth, 2007)

XIII. TOOLS DESCRIPTION

1. Socio Demographic Data

The Socio Demographic Information of the participants were obtained through items focusing on the participant's Age,

Gender, Educational Qualification, Year of Pursuing and Name of the Institution.

2. Grit scale

The Grit scale was developed by Angela L. Duckworth in 2007. The questionnaire contains 12 statements. The participants rate their opinion with the statements on 5 point Likert scales. These 12 statements helps the researcher to measure the level of grit among MBA, MBBS & BE students.

XIV. PROCEDURE

The samples (n=300) were administered with the Personal Information Schedule to obtain their personal and socio-demographic information. After the fulfilment of all necessary requirements, the Grit Scale was administered to the participants of the present study with the following instructions: Read each statement carefully. Please respond to the following statements using the following with 5 responses- very much like me, mostly like me, somewhat like me, not much like me, not like me at all.

Select any one response which is most appropriate to you and put a tick mark under that response for each statement. Be honest in your responses. There are no right or wrong answers. So please do not omit any item. There is no time limit but try to complete it as soon as possible. After giving instructions, the test is conducted. After collecting the responses, they were scored based on the scoring key. The results were tabulated and statistical analysis was done.

XV. STATISTICAL ANALYSIS

Mean, Standard Deviation, Cronbach's Alpha reliability, Power analysis (using Minitab), One-Way Anova, were used for analysing the collected data. The statistical analysis were done by using IBM SPSS 20.00.

XVI. SAMPLING TECHNIQUE

The sampling technique used is Stratified Purposeful Sampling. The study has been conducted purposively among BE, MBA, MBBS students who are pursuing BE, MBA, MBBS currently. Thus the sampling technique used in this study is Stratified Purposeful Sampling.

XVII. SAMPLING

The data samples were collected from the students who are pursuing MBA, MBBS, Engineering in Coimbatore district. 300 samples were collected.

MBA	MBBS	ENGINEERING
100	100	100
TOTAL		300

XVIII. INCLUSION CRITERIA

- Students of MBA, MBBS, ENGINEERING who are pursuing study in academics are taken.
- Students who are willing to participate in the study.

XIX. EXCLUSION CRITERIA

- Students who have completed the MBA, MBBS, ENGINEERING courses are excluded.
- Students from arts and science colleges are excluded.

XX. RESULTS AND DISCUSSION

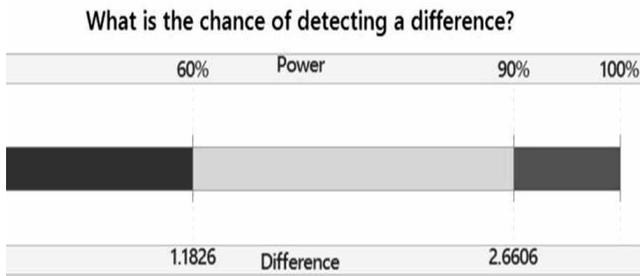
The present study was conducted to measure the level of grit of BE, MBA, MBBS. The size of the sample is n=300.

Table: 1 showing the reliability of grit scale among MBA, MBBS & ENGINEERING students

VARIABLE	NO. OF ITEMS	CRONBACH'S ALPHA
GRIT	12	0.61

Table 1 shows the reliability for grit scale among MBA, MBBS & ENGINEERING students using Cronbach's alpha. The reliability of grit scale is 0.61 which means this scale is reliable for this population. In line with previous research studies reports, result of analysis in this study suggested that the grit scale is reliable.

FIGURE:1 showing the power analysis (using Mini Tab) depicting the differences among mean score (for GRIT) of BE, MBA, MBBS students.

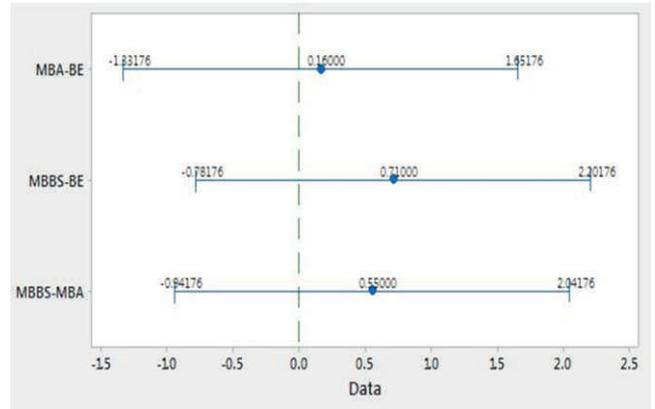


Power is the likelihood of concluding there are differences among the means when they truly exist. Based on the samples there is atleast 90% chance of detecting of difference of 2.6606 and at most a 60% chance of detecting a difference of 1.1826. There should be adequate power to detect differences that have practical consequences. *Power of 90% is often considered adequate.*

Table: 2 showing mean and standard deviation for the Grit scores among BE, MBA, and MBBS students.

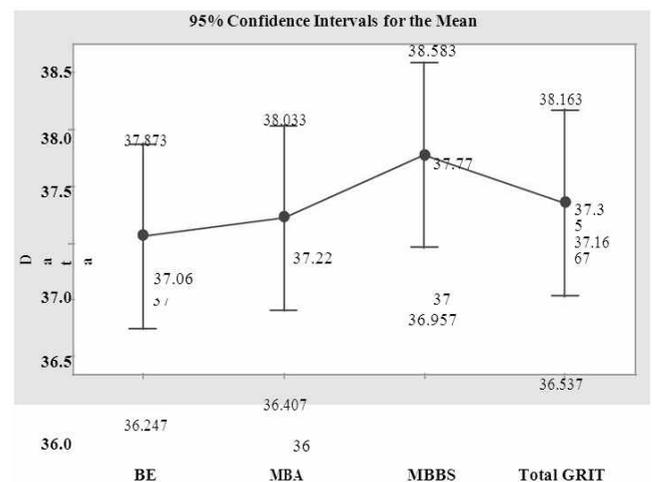
SAMPLE	SAMPLE SIZE	MEAN	STANDARD DEVIATION
BE	100	37.06	3.413
MBA	100	37.22	4.9677
MBBS	100	37.77	4.9479
TOTAL GRIT	300	37.35	2.7317

FIGURE : 2 showing Turkey Simultaneous 95% Confidence Interval- difference of means (FOR TOTAL BE, MBA, MBBS)



Turkey's method compares the means for each pair of factor levels using a family error rate (often called family wise error rate) to control the rate of type I error. The family error rate is the probability of making one or more type I errors for the entire set of comparisons. Turkey's method adjusts the individual confidence level, based on the family error rate you choose. The confidence intervals are used to determine likely ranges for the differences and to assess the practical significance of the differences. *From Figure 2 it can be informed that the interval does contains a zero and hence there is a statistically significant difference between the corresponding means.* This explains that the corresponding intervals of total BE, MBA, MBBS is significantly different and a practical significant difference does exists between them.

FIGURE : 3 showing Confidence Interval Plot – BE, MBA, MBBS – GRIT SCORE



In Figure 3, each dot represents a sample mean. Each interval is a 95% confidence interval for the mean of a population. You can be 95% confident that the population mean for each level is within the corresponding interval. If the intervals for two means do not overlap, it suggests that the population means are different. You should interpret these intervals with caution, however, because your rate of type I error increases when making multiple comparisons. Thus, when making multiple comparisons, you should use one of the five available methods for controlling the rate of type I error.

Each interval is a 95% confidence interval for the mean of a population. The population mean for each level is 95% within the corresponding interval. The interval of means of total BE, MBA & MBBS shows that the population means are different. Power is the likelihood of concluding there are differences among the means when they truly exist. The power of 90% or greater is considered adequate. This shows that the population means are different and the 95% confidence interval of means is adequate.

XXI. SUMMARY AND CONCLUSIONS

This study was done to measure the level of grit among MBA, MBBS and BE students. Reliability of grit among this population and the differences of mean among three groups (BE, MBA, MBBS) are found using Cronbach's alpha and One Way Anova respectively.

- The Cronbach's reliability for grit scale for this population is 0.61
- There is a statistically significant difference among the corresponding means of three groups (BE, MBA, MBBS).
- There is at least 90% chance of detecting of difference among mean of three groups (BE, MBA, MBBS).
- Population mean for each level is within 95% confidence level, which is considered adequate.

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