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How to Improve Academic Achievement? (Dynamics of the Influence of Grit on Academic Achievement in College Students): A Systematic Review

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A B S T R A C T

Academic achievement is a term that refers to the results of a person's performance which shows the extent to which a person has achieved certain goals, especially in the academic field which he does optimally. One factor that can influence academic achievement is Grit. Grit is persistence and the desire to achieve goals in the long term. This systematic review aims to analyze international journals related to academic achievement and grit with the subject of students in the field of education. A literature search was carried out on publications written in English on selected topics using five databases, namely Google Scholar, Sciencedirect, Taylor & Francis Online, Wiley Online Library. Only studies that investigated or measured academic achievement and grit in college students were included. The results of the systematic review show that grit can be a predictor in predicting academic achievement, but it is possible that grit is not the main predictor in predicting academic achievement, especially for students. This is proven by the results of this systematic review, where it was found that the research results were inconsistent. There are several studies that reveal that grit can be positively correlated with academic achievement, but grit is also not correlated with academic achievement.

Keywords: grit, academic achievement, college student

1. Introduction

The term drop out is familiar, especially as a phenomenon at the tertiary level. One of the concrete reasons why students drop out of campus is because they have passed the specified study time limit, did not pass the mandatory courses, did not meet the minimum number of credits, did not complete the final assignment (thesis), and others (Jabar, 2023). This is part of academic achievement, if individuals can optimally try to achieve these things during their studies at university (Lubis & Aditiya, 2023). Academic achievement is a term that refers to the results of a person's achievements in accordance with his goals in the academic field, and the success of his efforts in studying optimally, the results obtained are in the form of grades and numbers or symbols (Agusti & Rahmadhani, 2020; Iryanti, 2014; Mardelina & Muhson, 2017; Setiawan, 2000; Umamah et al., 2018).

Based on data from the Directorate General of Higher Education, Research and Technology (Ditjen Diktiristek) which refers to the document "Higher Education Statistics 2022", the number of college dropouts in Indonesia has decreased compared to the previous year. However, it cannot be denied that the dropout rate is still quite high in Indonesia, namely 375,134 students from all levels of higher education who dropped out (DO) who withdrew or were expelled from campus. East Java is recorded as the province with the highest number of college dropouts in 2022, namely 55,667 (4.91%) students. Therefore, individuals or students need to put more effort or optimally exert themselves in learning in tertiary studies, to reduce the rate of dropping out of college.

Several factors that can influence academic achievement include internal factors (self-concept, self-efficacy, personality, intelligence, etc.), external factors (environment, social status, family and infrastructure), physiological factors, psychological factors, (Agusti & Rahmadhani, 2020; Arofah et al, 2020; Chairiyati, 2013; Garkaz et al, 2011). Apart from that, grit (persistence) is also a strong factor or predictor in understanding learning, and revealing academic success or achievement, as well as specifically overcoming problems related to challenges in learning (Duckworth et al, 2007). Therefore, grit is described as persistence and the desire to achieve goals in the long term (Duckworth et al., 2007). Grit is part of the personality factor, because it can see differences between individual abilities in achieving academic achievement (Christopoulou, 2018).

Grit has two dimensions, namely persistence of effort and consistency of interest. Persistence of effort is defined as a person's determination to achieve a predetermined or targeted goal, even though there are obstacles or challenges in the process (Duckworth et al, 2007). Perseverance functions in overcoming difficulties when faced with various failures. In the realm of education, this creates a person or student's enthusiasm to get back up, even though they have failed many times (Muhibbin & Wulandari, 2021). Therefore, someone with high grit will tend to have high achievement. The second dimension, namely, consistency of interest, is defined as a person's ability to regulate their interests and attention towards one goal, which makes a person

bound to always be committed to achieving their goals (Duckworth et al., 2007). In the educational context, a person or student with a high interest in learning can have an impact on him or her continuing to follow until completion and liking the learning process delivered by their teacher at school (Muhibbin & Wulandari, 2021).

The role of grit in education is that grit shows a positive correlation, grit correlates with academic achievement (Christopoulou, 2018; Stoffel & Cain 2018). In that sense, grit contributes to academic performance. Apart from that, academic performance is also correlated with grit (Pate et al, 2017). Students with high grit tend to achieve maximum academic performance, compared to students who have low grit. Grit can be a predictor of individual success in the learning process at school as well as in work (Fernandez-Martin et al, 2020). The results of this research show that grit has a contribution to education, especially when linked to variables in education.

Based on the explanation above, several studies show the positive influence of the grit variable on academic achievement. These results show the importance of the grit variable to improve academic achievement. Previous research conducted used quantitative correlational research. Apart from that, there was previous research with a systematic review method on grit variables and academic achievement, but the journal publications used in the review used old years, namely 2007 to 2018, the subject did not focus on students, and analyzed the dynamics of relationships, as well as analyzing further the differences in levels. education (Lam & Zhou, 2019; Lam & Zhou, 2022).

Therefore, this systematic review aims to look at the dynamics of the grit variable in influencing academic achievement in students by specifically analyzing the latest journal publications from 2019 to 2023, as well as reviewing the use of measuring tools that can influence the magnitude of the influence of the two variables. Apart from that, it is focused on students because the phenomenon related to dropout is quite a concern at the tertiary level. It is hoped that this systematic review research will provide information regarding efforts to improve academic achievement in higher education so that it is beneficial for individuals or students, and can be used as a basis for further research.

2. Method

In writing a systematic review, there are several process stages carried out. The first stage is, creating review questions. The predetermined review topic ideas are explored to clarify the direction of the review and what findings can be obtained to strengthen the review. The review question used in this article is the SPIDER formulation (*Sample, Phenomenon of Interest, Design, Evaluation, Research Type*). Review questions are structured according to this formulation. The research question in this systematic review is what are the dynamics of the influence of grit on academic achievement in students?

Next, in the second stage, determine the inclusion and exclusion criteria for the systematic review. Determining the inclusion criteria in this review, namely: (1) journal articles discussing student grit as the independent variable and academic achievement as the dependent variable, (2) the subjects are students, (3) the type of quantitative research, (4) English language journals, and , (5) the research was conducted from 2019 to 2023. Meanwhile, the exclusion criteria are: (1) journals that discuss grit and academic achievement outside the educational context, (2) journals not written in English, (3) journal articles with book types , reviews, reports, literature reviews, and research where the method description is unclear.

Then, in the third stage, namely determining the keywords or keywords for searching the database, and determining the database that will be used to search for the specified keywords or keywords. The keywords determined in this systematic review research include: grit, consistency of interest, persistence of effort, perseverance, interest, academic achievement, academic performance, school performance, and school achievement, college student, university student. These keywords are used or entered in several databases to search for articles. Some of the databases used are Google Scholar, Sciencedirect, Taylor & Francis Online, Wiley Online Library.

Finally, in the fourth stage, journal selection or identifying literature (screening). At this stage, duplicate journal screening was carried out using Mendeley and Rayyan. Then, journals that have passed the duplication check are continued with filtering based on title and abstract. Journals that pass title and abstract screening are followed by analysis of the journal as a whole or full text. After selecting journals, 319 journals were initially collected or found, 15 journals were obtained that met the inclusion and exclusion criteria, namely the dynamics of grit and academic achievement in the field of education among students. The journal selection flow graph can be seen in Figure 1.

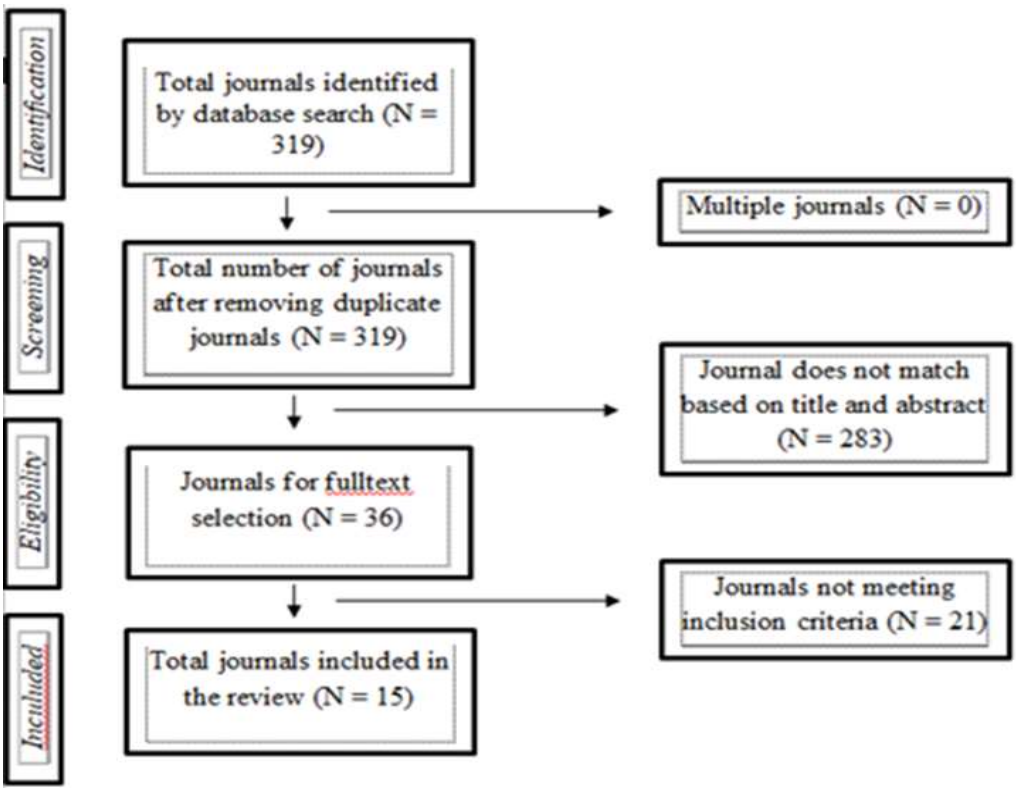

Figure 1. PRISMA Charts for Journal Selection Flow

3. Result and Discussion

Characteristics of the Research Included

During this literature search. Obtained 319 journal articles identified from Google Scholar (n = 198), Sciencedirect (n = 39), Taylor & Francis Online (n = 39), Wiley Online Library (n = 43). The journal articles obtained were entered into the review management program, namely Mendeley and Rayyan, to check for duplicates. Not a single journal article was detected as a duplicate. Thus, a total of 319 articles were studied further. Furthermore, by identifying the titles and abstracts of articles, 283 articles were excluded in this screening process. Then produced 36 articles to be reviewed in full text. In this process, 21 articles were excluded because they did not meet the inclusion criteria. Most of the eliminated studies met more than one exclusion criterion. Finally, 15 journal articles were further analyzed in the writing of this article.

Table 1. Socio-demographic characteristics

No	Study	Study Design	Country	Participants	N (Sample Size) Male/Female	Age ofcollege student/Mean
1	Bryce T. Daniels, et al. (2023)	Quantitative correlational, cross-sectional study	Southern Region	Student	875= Female n = 375 (43%) Male n = 500 (57%) White = 82% New students= 62%	M= 20 years
2	Yaure, RG, et al. (2021)	Quantitative correlational, longitudinal study	Northeastern United States	Students at three large campuses	126 = Female = 82 (65.1%) Male = 43 (34.1%) Others 1 (0.01%)	18-20 = 98 (77.7%) 21-30 = 26 (20.6%) 31+ = 2 (0.2%)

3	Suhaimie, NS, et al. (2021)	Quantitative correlational, cross-sectional study	Malaysia	Student	220	-
4	Tannoubi, A., et al. (2023)	Quantitative correlational, cross-sectional study	Tunisian Kef	Student physical education and sports	488 = Female = 252 (51.6%) Male = 236 (48.3%) Eliminated outliers (n = 29) Final N = 459	19-25 years old M = 21 years (Female, M = 21 ± 1.3 years; Male, M = 20.8 ± 1.35 years)
5	Fang, M., & Choi, K. (2022)	Quantitative correlational, cross-sectional study	Australia	Students enrolled in online management programs	196 = Women = 140 (71.4%) Male = 56 (28.6%) First year = 116 (59.2 %) Second and third year = 80 (40.8%) Domestic = 115 (58.67%) International = 81 (41.33%)	-
6	Underwood, K. (2023)	Quantitative correlational, cross-sectional study	South side	Students enrolled at large public institutions	366 = Female 51.1% Male 48.6% White = 249 (19.9%) Black = 73 (4.1%) Asia = 15 (3.6%) Group of students on academic probation = 170 Group of students with good academic achievement = 196	M = 20.51 years
7	Howard, J.M., et al. (2019)	Quantitative correlational, cross-sectional study	Southeastern United States	Student	226 = Female = 186 (82%) Male = 40 (18%) White = 151 (67%) African-American = 65 (29%) Asia =5 (2%)	18 – 25 years M = 20.12 years
8	Afzal, S., Zamir, S., & Sultana, N. (2023)	Quantitative correlational,	Pakistan	Students who take online classes	238	-

		cross-sectional study				
9	Gruenberg, K., et al. (2019)	Quantitative correlational, cohort study	California	Pharmacy student	852 = 422 students (84%) completed the survey in fall 2016 430 students (86%) Female 70% Majority of East Asian/Filipino/Pacific Islander descent 54%	M = 25 years
10	Park, Y.L., & Lee, H.J. (2020)	Quantitative correlational, cross-sectional study	Korea	Student	136 = Male 53% Administration major 32.6%, Psychology (14.1%), Mechanical Engineering (8.9%)	M = 22.47 years
11	Lumontod III, RZ (2019)	Quantitative correlational, cross-sectional study	Philippines	New undergraduate student at Central Luzon State University	313	M = 18.87 years
12	Reysen, R., et al. (2019)	Quantitative correlational, cross-sectional study	Oxford	Student	252 = Students at risk = 107 (42.5%) Students not at risk = 145 (57.5%) Female = 112 (44.4) Male = 140 (55.6%) White = 176 (69.8%) Blacks = 46 (18.3%) Hispanic/Latino = 19 (7.5%) Hawaii/Pacific = 1 (0.4%) American Indian = 3 (1.2%) Asia = 4 (1.6%) Two feelings of knowing more = 3 (1.2%) The majority are male	-
13	Walsh, M.J. (2020)	Quantitative correlational,	Southwestern United States	Doctoral student	478 = Female = 324 (67.8%)	24–35 years = 87 (18.2%)

		cross-sectional study			Male = 153 (32%) Male transgender = 1 (0.2%) White = 287 (60.0%) Black/African American = 115 (24.1%) Hispanic/Latino = 42 (8.8%) Others = 21 (4.4%) Asia = 10 (2.1%) America-India/Alaska = 2 (0.4%) Hawaii/Pacific = 1 (0.2%) First year = 94 (19.7%) Second year = 106 (22.2%) Third year = 128 (26.7%) Fourth year = 85 (17.8%) Fifth Year onwards = 65 (13.6%)	36–45 years = 157 (32.8%) 46–55 years = 150 (31.4%) 56–65 years = 75 (15.7%) 65+ = 9 (1.9%)
14	Calo, M., et al. (2022)	Quantitative correlational, cross-sectional study	Australia	266 studentsPhysiotherapy	266 = Female 54.9% Male = 41.7% Others = 3.4%	22-24 years old
15	Almeida, DJ, et al. (2021)	Quantitative correlational, cross-sectional study	California	156 students	156 = Female (76%) Male (24%) Latino (44%) White (31%) Asia and Pacific (12%) Black (9%) America (3%) Two flavors or more (17%)	-

The 15 studies included included cross-sectional, longitudinal and cohort studies (see table 1). The number of studies published by different geographic regions is, as follows: United States (3), Australia (2), Malaysia (1), California (2), Pakistan (1), Korea (1), Philippines (1) , Oxford (1), Kef Tunisia (1), Southern region (2).

Instrument for Measuring Main Construct

Table 2. Self-administered measurement tools used to examine grit and academic achievement.

Grit Measurement		
Measuring instrument	Description of Measuring Tools	Studies Reviewed Used this Measuring Tool
Original Grit Scale (Grit-O) by Duckworth and Quinn (2007)	Used to assess student grit levels. Consisting of 12 questions, in Likert form with a range of 1 (not like me at all) to 5 (very much like me). It has two dimensions, namely persistence of effort and consistency of interest. Three measures of grit can be used, namely overall grit, persistence of effort and Consistency of Interest.	Suhaimie, NS, et al. (2021); Underwood, K. (2023); Park, Y.L., & Lee, H.J. (2020); Reysen, R., et al. (2019); Almeida, DJ, et al. (2021)
Short Grit Scale (Grit-S) by Duckworth and Quinn (2009)	Used to assess student grit levels. Consisting of 8 questions, in Likert form with a range of 1 (not like me at all) to 5 (very much like me). It has two dimensions, namely persistence of effort and Consistency of Interest. Three measures of grit can be used, namely overall grit, persistence of effort and Consistency of Interest.	Bryce T. Daniels, et al. (2023);Yaure, RG, et al. (2021); Fang, M., & Choi, K. (2022); Howard, J.M., et al. (2019); Afzal, S., Zamir, S., & Sultana, N. (2023); Gruenberg, K., et al. (2019); Lumontod III, RZ (2019);Walsh, M.J. (2020); Calo, M., et al. (2022)
Physical education grit scale (PE-Grit)	Used to assess student grit levels. Consists of 16 items in Arabic. Measuring grit in 4 dimensions, namely physical interest, physical effort, academic interest, academic effort. Each dimension has 4 items.	Tannoubi, A., et al. (2023)
Academic Achievement Measurement		
Measuring instrument	Description of Measuring Tools	Studies Reviewed Used this Measuring Tool
Academic Success Inventory for College Students (ASICS) by Prevatt et al., (2011)	Used to assess academic achievement by looking at student academic success. Consists of 50 items in Likert form with a range of 1 (strongly disagree) to 7 (strongly agree). The aspects measured include general academic skills, internal motivation, perceived instructor efficacy, concentration, external motivation, socializing, career decidedness, lack of anxiety, personal adjustment, and current motivation to perform.	Howard, J.M., et al. (2019)
GPA (Grade Point Average)	Used to assess academic achievement based on the average score obtained during college studies.	Bryce T. Daniels, et al. (2023);Yaure, RG, et al. (2021); Suhaimie, NS, et al. (2021); Tannoubi, A., et al. (2023); Fang, M., & Choi, K. (2022); Underwood, K. (2023); Afzal, S., Zamir, S., & Sultana, N. (2023); Gruenberg, K., et al. (2019); Park, Y.L., & Lee, H.J. (2020); Lumontod III, RZ (2019); Reysen, R., et al. (2019);Walsh, M.J. (2020); Calo, M., et al. (2022); Almeida, DJ, et al. (2021)

Based on the results of this systematic review, it was found that the majority of measuring academic achievement uses GPA (Grade Point Average) and the measuring tool used to measure grit is the grit scale by Duckworth and Quinn (see table 2). However, there are several studies that use the original grit scale (Grit-O) by Duckworth and Quinn (2007), and others use the revised measuring tool, namely the short grit scale (Grit-S) by Duckworth and Quinn (2009). There is also one study that does not use GPA to measure academic achievement, but uses the Academic Success Inventory for College Students (ASICS) by Prevatt et al., (2011).

The use of the original grit scale (Grit-O) or short grit scale (Grit-S), in several studies, has also shown inconsistent results. Several studies using the short grit scale (Grit-S) have resulted in a significant influence between obtaining high grit scores and academic achievement in the form of GPA, with

Persistence of Effort showing greater predictive power on students' actual score achievement than Consistency of Interest (Bryce , et al., 2023; Afzal & Sultana, 2021; Meanwhile, other research using the short grit scale (Grit-S) resulted in no significant influence between obtaining a high grit score and academic achievement in the form of GPA (Gruenberg, et al.. 2019; Lumontod, 2019; Walsh, 2020). Of the 9 studies that used the short grit scale (Grit-S), 6 of them obtained significant results on high grit scores with GPA, while 3 of them did not.

Furthermore, the use of the original grit scale (Grit-O) resulted in no significant influence between obtaining a high grit score and academic achievement in the form of GPA (Suhaimie, et al., 2021; Almeida, 2021). Meanwhile, other research reveals that there is a significant influence between obtaining a high grit score and academic achievement in the form of GPA (Underwood, 2023; Park & Lee, 2020; Reysen, et al,. 2019). Of the 5 studies that used the original grit scale (Grit-O), 3 of them revealed significant results between high grit scores and GPA, while 2 of them were not significant. There are other studies that use the physical education grit (PE-Grit) scale, but the results obtained do not show a significant effect between high grit scores and GPA, because it is possible that grit is not the main predictor of academic achievement. So, from the results of the study regarding the use of measuring instruments, the novelty of measuring instruments can be a consideration if you want to use them in research. Most studies use the short grit scale (Grit-S) by Duckworth and Quinn, which is a novelty of the original grit scale (Grit-O).

Table 3. Interest variables, analytic technique, and key findings of the studies included.

Author, Year	Variable	Analysis Approach	Results of the dynamics of grit and academic achievement
Bryce T. Daniels, et al. (2023)	*Grit, physical activity, and academic success.*	*Multiple linear regressions* *Bivariate correlations*	Grit is positively and significantly related to GPA (β = 0.187, p = 0.001). Grit with the Perseverance of Effort (POE) dimension is positively and significantly related to GPA (β = 0.155, p < .001). Meanwhile, Consistency of Interest (COI) was not significantly related (β = 0.046, p = .100).
Yaure, RG, et al. (2021)	*Grit, Resilience, Successful Academic Performance*	*Multiple linear regressions* *Bivariate correlations*	*Perseverance of Effort (POE)*was a significant predictor of GPA (r(108) = 0.34, p=.000). Meanwhile, Consistency of Interest (COI) did not independently predict GPA (r(108) =.17, p=.071).
Suhaimie, NS, et al. (2021)	*Grit, stress level, academic achievement*	*Multiple linear regressions* *Bivariate correlations*	*Grit*on student academic achievement does not show a significant effect. The grit variables (PE and CI) contributed to academic achievement by 0.4% (F (1, 219) = 0.41, p > .05). The grit dimension Perseverance of Effort (PE) on academic achievement (Beta = .015), (t=.222, p >.05). Meanwhile, Consistency of Interest (CI) on academic achievement (Beta= -.061), (t = -.896, p >.05) is not a significant predictor.
Tannoubi, A., et al. (2023)	*Academic engagement, study processes, and grit on the academic achievement*	*Regression coefficients*	The effect of grit on academic achievement is not significant (p > 0.05), but academic engagement (Estimate = 0.299, p < 0.001) and the learning process (Estimate = 0.397, p < 0.001) on academic achievement are significant. Because academic engagement and the learning process are two important factors that predict academic achievement, while grit is not the main predictor.
Fang, M., & Choi, K. (2022)	*Grit, learning readiness, characteristics, e-learning achievement*	*Path coefficients*	*Perseverance of effort*(grit) on students' perceptions of online learning (e-learning) achievements through supported structural path coefficients (standardized path coefficients= 0.172). Meanwhile, consistency of interest (grit) on learning achievement is not supported (standardized path coefficients= 0.063(.221)).
Underwood, K. (2023)	*Academic Entitlement, Grit, Prospective Memory, Retrospective Memory, and Undergraduate GPA*	*Bivariate correlations*	There is a significant relationship between grit and GPA (r (364) = 0.24, p < .001). Students with higher GPAs tend to have higher scores on the grit scale, which measures persistence of effort.
Howard, J.M., et al. (2019)	*Positive Parenting, Overparenting, Grit,*	*Bivariate correlations*(Pearson's R)	*Grit*correlated significantly with 7 of 10 aspects of academic achievement by ASICS (r = .423, p < .001). Further analysis,

	and Academic Success	*Mediation Analysis* *Structural Equation Modelling*(SEM)	grit significantly predicted academic achievement (F(1, 224) = 48.69, p < .001), accounting for 17.86% of the variance, B = 8.774, SE = 1.252, p < .001. Grit was used as a mediator of the relationship between parenting behavior (e.g., over-parenting, acceptance/involvement) and academic achievement. The results showed partial mediation.
Afzal, S., Zamir, S., & Sultana, N. (2023)	*Self-regulated learning, grit, grade achievements*	ANOVA *Linear Regression* *Parallel Mediation Analysis*	Grit is positively correlated with GPA (r=0.493, p<0.01). PE and CI also have a positive relationship. However, the relationship tends to be weak, because r <0.5. Grit significantly influenced GPA (β=.854, t=8.69, p< .001) and accounted for 24.3% of the variance in GPA. The grit mediator explains the influence of 84% on actual grade achievement (GPA). *Grit*and its aspects, namely Persistence of Effort and Consistency of Interest, fully mediate the relationship between online independent learning and students' actual achievement of grades. Persistence of Effort shows greater predictive power on students' actual achievement scores than Consistency of Interest.
Gruenberg, K., et al. (2019)	*Grit, academic outcomes*	*Logistic regression model*	A high Grit-S score was not associated with a high GPA or superior APPE performance. Grit did not significantly predict measures of academic achievement in this group of pharmacy students (0.89 [95% CI: 0.61- 1.28]).
Park, Y.L., & Lee, H.J. (2020)	*Grit,calling and academic achievement and Career Stress*	χ^2 (chi-square)	*Grit*has a positive relationship with academic achievement (r = 0.332, p < 0.01). Grit mediates the relationship between the two, namely calling and academic achievement and career stress.
Lumontod III, RZ (2019)	*Grit, college adjustment, happiness, academic performance/academic outcome*	*Correlation* *Multiple regressions*	*Grit*does not have a significant relationship with GPA (r = -0.032, p = 0.571). However, intercorrelations revealed freshman grit and college adjustment were significantly correlated (r = 0.341, p = .000). Additionally, college adjustment (β = .004, p = .026) and happiness (β = -.127, p = .000) had a significant influence on academic outcomes among freshmen.
Reysen, R., et al. (2019)	*Grit, academic success*	ANOVA	There is a significant positive correlation between grit scores and three of the four academic measures. Grit was positively correlated with resident cumulative grade point average (r (252) = 0.17, p < 0.01), resident semester grade point average (r (252) = 0.15, p < 0.05), and overall grade point average (r (252) = 0.21, p < 0.01.)
Walsh, M.J. (2020)	*Grade point average, conscientiousness, and grit*	*Simple linear regression* *Moderated regression analysis*	Grit did not significantly predict GPA (F(1, 477) = 2.25, p = 0.135). Also, there is no significant relationship (B = -0.033, SE = 0.029) between grit and grade point average (p = .257). Conscientiousness did not moderate the relationship between grit and grade point average (F(1, 474) = .206, p = .650).
Calo, M., et al. (2022)	*Grit, resilience, mindset, and academic success*	*Multiple regression analysis*	*Grit*positively related and an independent predictor of academic success(r=0.24, P≤ .001).
Almeida, DJ, et al. (2021)	*Grit, importance of social capital, academic success*	*Ordinary least square*(OLS) regression	*Grit*and its two components, namely consistency of interest and persistence of effort, do not predict GPA (β=0.0004 (0.0512).

Table 3 shows the dynamics of the grit variable in influencing student academic achievement in the field of education. Based on the findings of a systematic review of 15 journals collected, it shows that grit and academic achievement have inconsistent results. This is illustrated by several studies showing that grit is positively correlated with academic achievement (Bryce et al, 2023; Calo et al, 2022;Howard et al, 2019; Park & Lee, 2020; Reysen et al, 2019; Underwood, 2023; Yaure et al, 2021). In that senseThe subjects in the research were students who reported higher grit scores, they also achieved academic achievements in the form of higher GPAs. Apart from that, grit and its aspects, namely Persistence of Effort and Consistency of Interest, can also be mediating variables in relationships.*Self-regulated learning*with academic achievement (Afzal & Sultana, 2023). However, Persistence of Effort shows greater predictive power on students' actual achievement of grades than Consistency of Interest. Grit can also mediate the relationship between parenting behavior and academic achievement (Howard et al., 2019). Grit mediates the relationship between the two, namely calling and academic achievement and career stress (Park & Lee, 2020).

It was further explained that students with low grit have difficulty adapting positively to setbacks and lack the perseverance needed to maintain efforts to overcome challenges in the learning environment, thereby reducing the level of academic success (Calo et al., 2022). Additionally, persistence in effort was the best predictor of academic success compared with overall grit and consistency of interest, this has implications for future research investigating potential mechanisms and relationships that focus on persistence of effort in the university environment to increase academic success (Bryce et al., 2023). The ability to overcome obstacles and maintain effort is related to academic success, but the strongest predictor is effort persistence (Yaure et al, 2021).

Mediocre academic performance can be associated with low grit, further explaining that memory may play a role in determination and persistence in academics (Underwood, 2023). So this can be an alternative for increasing grit by improving memory, in order to achieve good academic performance. It was also found that academically at-risk students demonstrated lower levels of grit than their non-at-risk peers, because academically at-risk students may have additional life challenges that may interfere with their ability to achieve their academic goals (Reysen et al., 2019). So the environment plays quite a role in predicting grit and academic achievement.

Furthermore, in several other studies it was found that grit and academic achievement were not correlated with academic achievement (Almeida, 2021; Gruenberg et al, 2019; Lumontod, 2019; Suhaimie et al, 2021; Tannoubi et al, 2023; Walsh, 2020). This was explained further, that obtaining a higher grit score was not associated with academic achievement in the form of a higher GPA. Grit also does not appear to be a major predictor in predicting academic achievement. In addition, it was explained that when the dimensions of grit were tested one by one, it was found that the persistence of effort dimension was positively correlated with academic achievement (GPA). Meanwhile, the Consistency of Interest dimension does not correlate with academic achievement (GPA) (Bryce et al, 2023; Fang & Choi, 2022; Suhaimie et al, 2021; Underwood, 2023; Yaure et al, 2021). Thus, the grit dimension, namely persistence of effort, is a significant independent predictor of academic achievement (GPA). In other research, it was also found that the two dimensions of grit, namely consistency of interest and persistence of effort, did not predict academic achievement, namely GPA (Almeida, 2021).

Grit can be a predictor in predicting academic achievement, but it is possible that grit is not the main predictor in predicting academic achievement, especially for students. This is proven by the results of this systematic review, where it was found that research results do not consistently state that grit can be positively correlated with academic achievement. However, apart from that, several studies have shown a correlation between grit and academic achievement, which can already represent that to achieve academic achievement, individuals need todiligently trying to achieve his goals, especially in the academic field. This is because most research reveals that one of the dimensions of grit, namely persistence of effort, is positively correlated with academic achievement (GPA) (Bryce et al, 2023; Calo et al, 2022; Gruenberg et al, 2019; Howard et al, 2019; Fang & Choi, 2022; Suhaimie et al, 2021; Underwood, 2023; Tannoubi et al, 2023; Walsh, 2020; Yaure et al, 2021).

Academic achievement represents the results of a person's performance which shows the extent to which a person has achieved certain goals which are the focus of his activities in the teaching environment, especially in schools, colleges and universities (Steinmayr et al., 2014). Academic achievement can be measured in many ways. This includes specific test performance (e.g., exams), overall class performance (e.g., grades), or composite performance metrics aggregated across classes (e.g., grade point average or GPA) (Madigan & Curran, 2021; Steimayr et al. , 2014). Academic achievement tests and scholastic aptitude tests are also commonly used as entrance tests for further education (Steimayr et al, 2014).

The formation of academic achievement can be caused by several factors. The expectancy-value model according to Eccles and Wigfield (in Steimayr et al, 2014) explains that there are divisions in forming academic achievement, these divisions are namelydistal and proximal determinants. Long-range determinants consist of environmental factors (such as people's social beliefs), individual characteristics (e.g. gender), and previous experiences. An individual processes these distal determinants emotionally and cognitively. The outcomes of these processes (e.g., test anxiety, ability self-concept, goals) influence proximal determinants (expectations of success and subjective task value), which directly influence achievement and achievement-related behavior. Thus, the distal factor model does not have a direct effect on academic achievement, but only has an indirect effect. This model is characterized by the specification of complex interactions between variables as well as the central role of motivational constructs.

Apart from that, there is another model proposed by Byrnes and Miller (in Steimayr et al., 2014) which synthesizes aspects of the Eccles and Walberg model. According to them, in the opportunity propensity model, academic achievement depends on a person's access to an effective learning context (opportunity factor) as well as the individual's ability to take advantage of learning opportunities (propensity factor). In addition, distal factors (for example socio-economic status) also influence later achievement directly and indirectly through opportunity and predisposition factors. Another factor that is also a determining factor in academic achievement is student character (Steimayr et al, 2014).

Research conducted by Hattie (2008), shows that predictors of academic achievement are varied and complex. Personal (e.g. students), social (e.g. teachers), and environmental (e.g. schools) factors have all been shown to play a role. In particular, variables such as cognitive ability, well-being, social support, effort, practice, intelligence, motivation, conscientiousness, teacher clarity, feedback, homework, show a large positive relationship with

academic achievement (El Ansari & Stock, 2010; Poropat 2009; Richardson et al. 2014). In contrast, variables such as procrastination, anxiety, stress, depressive symptoms (long periods of bad mood, pessimism, and apathy), absenteeism fatigue, insomnia, stereotype threat, television, vacations, and changing schools showed a large negative relationship. with academic achievement (Richardson et al. 2012; Schneider & Preckel 2017; Winne & Nesbit 2010).

4. Conclusions

Academic achievement is a term that refers to the results of a person's performance which shows the extent to which a person has achieved certain goals which are the focus of his activities in the teaching environment, especially in schools, colleges and universities and the success of his efforts in learning optimally, the results of which are obtained in the form of values and numbers or symbols. Academic achievement is a hope for most students. There are several factors that can influence academic achievement, one of which is grit and especially the dimension of persistence of effort. This is because most research reveals that one of the dimensions of grit, namely persistence of effort, is positively correlated with academic achievement (GPA). Thus, grit, especially perseverance, can be a predictor in predicting academic achievement. Apart from that, using the latest measuring instruments can influence the magnitude of the influence of grit on academic achievement.

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