

Grit and Student Engagement: The Moderating Effect of Academic Buoyancy in High School Student

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Abstract

Student engagement is crucial for high school students to meet their academic demands. Several studies have shown a positive relationship between grit and student engagement, but several studies have also found that grit plays only a small role in predicting student engagement. This study aims to determine whether academic buoyancy can moderate the relationship between grit and student engagement in high school students. Student respondents were asked to complete an online survey in the form of a self-reported inventory, namely the Student Engagement Scale, the Academic Buoyancy Scale, and the Grit Scale. The results of a Moderated Regression Analysis of 348 participants showed that academic buoyancy played a role in strengthening the relationship between grit and student engagement. With a coefficient of determination of 0.441, this means that grit can explain student engagement, with academic buoyancy moderating by 44.1%. The results of this study demonstrate that academic buoyancy plays a role in strengthening the relationship between grit and student engagement. Academic buoyancy has been shown to be a protective factor that helps students overcome daily obstacles, which may affect their persistence and commitment in achieving their learning goals. The implication of the results of this study is that educational institutions should not only encourage students to be diligent but also facilitate students to develop problem-solving skills that focus on problem solving....

Keywords: Academic Buoyancy, Grit, High School Student, Student Engagement

INTRODUCTION

According to Indonesian Law No. 20 of 2003, the objective of education is to develop students' potential to become believers and God-fearing, people with noble morals, good health, essential knowledge and skills, creative and independent, so that they become democratic and responsible citizens. Education is therefore expected to bring about positive change and create a quality generation (Herman et al., 2026; Fatmawati et al., 2026).

To cultivate a quality generation, the Ministry of Culture, Research and Technology has developed the Independent Study Program. This program offers diversified in-school learning with optimized content, allowing students to deepen their understanding of concepts and develop their skills (Ministry of Education and Culture of the Republic of Indonesia, 2022). In implementing the independent study program, students are required to take the initiative to actively develop their knowledge. Therefore, when faced with the challenges of the independent study program, they are expected to persevere and strive to find more appropriate strategies to achieve their goals. In addition, as learners, they are expected to take the initiative to research and develop their knowledge and skills (Wijayanti et al., 2022). Students who are active and autonomous in their learning at school are referred to in psychology as engaged students.

According to Fredricks, student engagement is a condition in which students can actively participate in learning, which includes their thinking, behaviors, and emotions. According to several studies, student engagement consists of three dimensions (Fredricks et al., 2004). These three dimensions are considered independent, but in some studies, they can be considered as a whole describing student engagement (Moreira et. al, 2019).

The first dimension of student engagement is behavioral engagement. This dimension describes students' behavior, participating in classroom activities, not disrupting the class, completing assignments well, being diligent, focused, and active in class in a positive manner. The second dimension is emotional engagement. This dimension describes students' emotional involvement, which is manifested by positive and negative reactions to learning activities, such as high interest or low boredom. The third dimension is cognitive engagement. This dimension describes students' cognitive involvement in learning activities. It is reflected in the extent to which students demonstrate motivation to understand the material and master course-related skills. Several studies show that student engagement is essential to meet academic demands. It demonstrates a strong motivation to learn. It can be said that students greatly need their engagement, as it can influence their academic success and learning outcomes (Abubakar et al., 2017; Erdoğan, 2019).

Unfortunately, existing research shows a general decline in student engagement in middle and high school (Skinner and Pitzer, 2012; Wylie and Hodgen, 2012). This decline is thought to be related to biological changes experienced by adolescents, cognitive changes, changes in family and peer relationships, identity concerns, and changes in social roles. This decline in student engagement is primarily due to the increased learning demands students face in high school (Wang and Eccles, 2012). Research conducted among high school students in Indonesia shows that only a small percentage of students display high levels of engagement (Muliani et al., 2012). This lack of engagement among high school students is also supported by research from the High School Student Engagement Survey, which shows that high school students are often bored in school and unable to make the most of their classroom learning time (Yazzie-Mintz, 2010).

Given the constant variation in student engagement levels, it is necessary to examine the factors that may play a role in this. In the field of education, perseverance, or grit, is a psychological factor currently being examined in many studies. Grit is a character which demonstrates by perseverance and enthusiasm needed to achieve long-term goals (Duckworth et al., 2007). Grit is characterized by two aspects: constancy of interest and persistence of effort. (Duckworth et al., 2007). Therefore, grit can be interpreted as follows: with perseverance, resilience, endurance, ambition, hard work.

In his research, Hodge explains that persistent and resilient students generally have an intrinsic motivation to engage in active behavior in their learning activities. Several studies have shown a positive correlation between grit and student engagement, meaning that more gritty students will have better student engagement (Hodge et al., 2018; Yau and Shu, 2023).

Although a positive relationship has been established between grit and student engagement, several studies have also shown that grit plays only a minor role in predicting student engagement (Datu and Yuen, 2018; Von Culin et al., 2014). That is, previous studies have found variations in the strength of the relationship between grit and student engagement. Therefore, it is suspected that other factors influence the strength of this relationship.

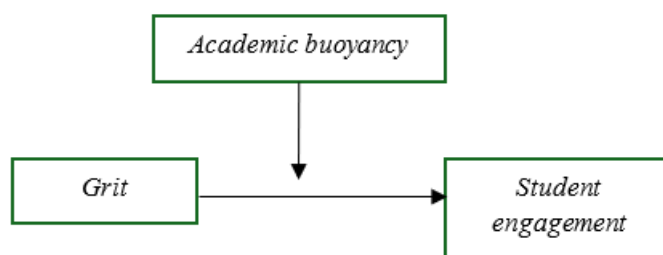
In their education, it is considered that all students have encountered difficulties or obstacles (Martin and Marsh, 2009). Martin and Marsh stated that the difficulties or obstacles encountered by students in the daily learning process can be termed as everyday hassles. These hassles are a set of stresses and tensions caused by small events that occur regularly in life (Martin and Marsh, 2008a). Martin stated that academic buoyancy is necessary to overcome the everyday hassles that students face. Academic buoyancy is defined as the ability of students to overcome common academic failures or challenges (Martin and Marsh, 2008b). Students are said to have the ability or aptitude to overcome problems, setbacks, daily academic challenges or have academic buoyancy if they can solve problems effectively (Datu and Yuen, 2018), where effective problem solving involves using a problem-oriented coping strategy (Martin and Marsh, 2008a).

Several studies have shown that students' ability to overcome daily difficulties and challenges in high school can influence their level of student engagement (Skinner and Pitzer, 2012). Students must be able to overcome daily academic difficulties, problems, and obstacles to remain persistent and engaged in classroom learning activities (Martin and Marsh, 2009). Successfully overcoming daily challenges at school will motivate them to continue to demonstrate effort, perseverance, initiative, and intensity in their learning. Students can enjoy classroom learning activities, demonstrate enthusiasm, and maintain their interest in classroom learning activities. In research conducted by Frydenberg, Martin and Collie on adolescents in Asia and the Pacific, it was shown that students who have academic buoyancy, demonstrate perseverance, concentration on classroom learning activities and enthusiasm, interest and feelings of enjoyment towards classroom learning activities (Collie et al., 2017).

In this study, students' ability to overcome daily obstacles, or academic buoyancy, is expected to strengthen the relationship between grit and student engagement. Students' ability to effectively solve problems by focusing on the problem can strengthen the relationship between perseverance and student engagement. Therefore, two hypotheses are proposed in this study. The first hypothesis of this study is that grit plays a role in student engagement. The second hypothesis of this study is that academic buoyancy can act as a moderator in the relationship between grit and student engagement. This study aims to test the above two hypotheses among high school students in Indonesia.

This study was conducted considering the importance for all students to be involved in their learning activities at school. Therefore, it is necessary to find empirical evidence of the importance of perseverance and grit as a factor in student engagement. It is also necessary to identify other psychological variables necessary for students to support the relationship between grit and student engagement. In this study, academic buoyancy is proposed as a moderating variable in the relationship between grit and student engagement, as it is considered a psychological quality necessary for all students who may have encountered academic obstacles or difficulties. To the researcher's knowledge, no study has tested these three variables with the same research model as the one proposed in this study. Therefore, the researcher wishes to conduct a study to determine whether academic buoyancy can be a moderator of the relationship between grit and student engagement among high school students. The conceptual framework of this study is described below.

Figure 1 Conceptual framework of research



Method

Research Design

This study used a quantitative method with a non-experimental correlational approach and a cross-sectional approach (Sari et al., 2026). This approach was chosen because of its efficiency in collecting data from many participants in a relatively short time, making it suitable for exploring the relationships between the variables studied.

Research Respondents

The population of this study consisted of high school students from all over Indonesia, aged 15 to 18 years. The inclusion criteria for respondents were those from schools implementing the independent program. The sampling technique used was non-probability sampling with convenience sampling, where participants were selected based on their convenience and willingness to participate in the study (Gravetter and Wallnau, 2015). A total of 348 respondents were obtained in this study. Data collection was carried out by distributing *online questionnaires* via social media platforms. To ensure data quality, each respondent was asked to complete the questionnaire after receiving a brief explanation of the research objectives. The questionnaires were collected and stored anonymously to protect the privacy of the participants and to comply with research ethics principles.

Research instruments

Student engagement is measured using the School Engagement Scale compiled by (Savitri et al., 2016). The School Engagement Scale is based on theory (Fredricks et al., 2004) and consists of 29 items. The validity results of the measurement instrument are behavioral engagement (10 items) with a validity index of 0.253 to 0.612; emotional engagement (10 items) with a validity index of 0.387 to 0.626; and cognitive engagement (9 items) with a validity index of 0.359 to 0.594. The reliability of behavioral engagement is 0.685, which indicates moderate reliability. The reliability of cognitive engagement is 0.600, which indicates moderate reliability. Finally, the reliability of emotional engagement is 0.648.

Grit is measured using the Grit scale compiled by (Edwina and Vivekananda, 2017) based on theory (Duckworth et al., 2007) It consists of 18 items. The validity of the grain measuring instrument is 0.300 to 0.654. The reliability of the grain is 0.888, which means that the grain measuring instrument has high reliability.

Academic buoyancy was measured using the Academic Buoyancy Scale (Martin and Marsh, 2008a). This instrument was adapted to Indonesian culture and reliability calculations yielded construct reliability scores (CR 0.823 and VE 0.54) (Rohinsa Sitompul, 2021). These coefficients indicate that the Indonesian version of the Academic Buoyancy Scale used in this study is reliable and trustworthy.

Data analysis was performed using moderated regression analysis (MRA). MRA, this analytical approach preserves the integrity of the sample and provides a basis for controlling for the influence of moderating variables (Ghozali, 2016).

Results

Table 1 Sociodemographic data of respondents

Sociodemographic data		Percentage
Gender	Man	34.48
	Women	65.52
Age	15	25.57
	16	27.87
	17	28.74
	18	17.82
School	Country	46.55
	Private	53.45
Everyday hasless	Once	86.79
	Never	13.21

Table 1 presents the sociodemographic data of the respondents in this study, which consisted of 348 high school students across Indonesia. Most were female. Their age range was between 15 and 18 years, with the highest age being 17 years. The respondents came from both public and private high schools, but the majority of them came from private high schools. Almost all of them encountered academic obstacles or difficulties (*everyday hassles*) during their schooling.

Table 2. Regression results of the role of Grit on Student Engagement

Model	Unstandardized coefficient		Standardized coefficient	T	Significant
	B	Standard error	Beta		
Constant	13,931	3,023		3,593	0.000
Grit	1,192	0.052	0.880	18,574	0.000

Dependent variabel : student engagement

Table 2 presents the results of the regression test of the role of grit on student engagement, which is the first hypothesis of this study. Based on the hypothesis test conducted, the calculated t-value was 18.574 and a significance value of $0.000 < 0.05$. This result indicates that the first hypothesis of this study is accepted, meaning that grit demonstrated a significant positive role on student engagement.

Table 3. Results of determining the coefficient of the role of Grit on Student Engagement

Model	R	<i>R squared</i>	<i>Adjusted R-squared</i>
	0.390	0.391	0.289

Table 3 shows the coefficient of determination of the role of grit on student engagement, which is 0.289. This result indicates that grit has a role of 28.9% on student engagement.

Table 4. Regression results of the role of Grit on Student Engagement with Academic Buoyancy as a Moderator

Model	<i>Unstandardized coefficient</i>		<i>Standardized coefficient</i>	T	Significant
	B	Standard error	Beta		
Constant	9,291	7,866		1,148	0.258
Grit	1.101	0.205	0.728	4,394	0.000
AB	0.673	0.162	1,015	3,803	0.000
Grit* AB	0.007	0.002	0.785	2,815	0.004

Dependent variable: student engagement

Table 4 presents the results of the regression test of the role of grit on student engagement, with academic buoyancy as a moderator, which is the second hypothesis of this study. Based on the hypothesis test conducted, the calculated t-value was 2.815 and the significance value was $0.004 < 0.05$, which means that the second hypothesis of this study was accepted. This means that grit was proven to play a role in student engagement, and the academic buoyancy variable was proven to be a moderator in the relationship between the two variables.

Table 5. Results of moderated regression analysis test of the relationship between student Grit and Student Engagement with Academic Buoyancy as a Moderator

Model	R	R squared	Adjusted R-squared
	0.420	0.446	0.441

Table 5 illustrates the significant role of grit in student engagement, with academic buoyancy serving as a moderator. The coefficient of determination in Table 5 is 0.441. This indicates that grit can explain student engagement, moderated by academic buoyancy by 44.1%. Therefore, academic buoyancy has been shown to play a role in strengthening the relationship between grit and student engagement.

Discussion

The results of this study indicate that grit plays a positive and significant role in high school students' engagement. They demonstrate that students' persistence and focus on the goals they want to achieve play an important role in their participation and involvement in their learning activities. These findings are consistent with previous studies, which have also demonstrated that grit plays a significant positive role in student engagement. (Yau and Shu, 2023). Grit is believed to help students stay focused and persistent in achieving their goals, and *it* also helps motivate them to engage in learning activities at school (Steinmayr et al., 2019). With grit, students will be motivated to complete their homework, which demonstrates their student engagement. (Tao et al., 2022).

The results of this study also show that the relationship between grit and student engagement is moderated by academic buoyancy. These results demonstrate that the presence of academic buoyancy can strengthen the relationship between grit and student engagement.

Martin believes that all students face challenges and obstacles in their schooling. These challenges and obstacles are usually caused by minor, but routine events (Martin, 2013). This is consistent with the results of this study, which show that almost all the students who responded to this study, or 86.7% of high school students, have encountered difficulties or obstacles in school, which Martin describes as everyday hassles. Therefore, students' ability to overcome daily obstacles and challenges, or academic buoyancy, is a factor that contributes to strengthening student engagement (Martin, 2013).

The results of this study, which demonstrate the role of academic buoyancy as a moderator in strengthening the link between grit and student engagement, provide empirical evidence of the importance of students' perseverance and commitment to achieve their goals. However, in this process, students cannot escape challenges and obstacles that could harm their involvement or commitment. In this context, academic buoyancy plays a proven role in strengthening the link between grit and student engagement. Academic buoyancy has been shown to be a protective factor that helps students overcome everyday obstacles, which can affect their perseverance and

commitment in achieving their learning goals. Indeed, students with high academic buoyancy can solve problems effectively through a problem-centered approach (Datu and Yuen, 2018). By overcoming academic obstacles, students can resolve everyday hassles constructively. Their success in solving these everyday hassles will strengthen their self-esteem and encourage them to engage in classroom learning activities (Jahedizadeh et al., 2019; Martin and Marsh, 2008a).

Conclusion

The results of this study highlight the importance of students' ability to overcome daily academic obstacles, also known as academic buoyancy. Academic buoyancy has been shown to play a role in strengthening the link between grit and student engagement. Academic buoyancy has been shown to be a protective factor that helps students overcome daily obstacles, which can affect their persistence and commitment to achieving their learning goals. This research suggests developing interventions that can encourage students to develop a persistent and enthusiastic character in achieving long-term goals. Furthermore, educational institutions should facilitate students' development of problem-solving skills that focus on problem-solving. These interventions are expected to increase students' engagement in their learning activities at school.

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