NETJOURNALS

African Educational Research Journal
Vol. 11(3), pp. 441-451, September 2023
DOI: 10.30918/AERJ.113.23.066
ISSN: 2354-2160
Full Length Research Paper

Grit and academic life satisfaction: Assessment of the mediating role of school engagement

Yüksel Eroğlu[1] and Meva Demir Kaya[2]

[1]Department of Educational Sciences, Faculty of Education, Afyon Kocatepe University, Afyon, Turkey.
[2]Department of Psychology, Faculty of Letters, Ataturk University, Erzurum, Turkey.

Accepted 7 September, 2023

ABSTRACT

This research was planned to reveal whether school engagement is a mediator in the relationship between grit and academic life satisfaction in university students. 487 students, including 316 (65%) males and 171 (35%) females, were recruited. The students were 18 to 33 years old, and the mean age was 20.62. The measures included the Academic Life Satisfaction Scale (ALSS), the Short Grit Scale (GRIT-S), the Utrecht Work Engagement Scale-Student Form (UWES-SF), and a Personal Information Form (PIF). Data analysis included the structural equation model and Pearson's correlation analysis. A statistically significant positive correlation was observed between grit, school engagement, and academic life satisfaction. In addition, grit and academic life satisfaction were mediated by school engagement. We handled the results considering grit and school engagement in raising the academic life satisfaction of university students.

Keywords: Academic life satisfaction, grit, school engagement, university students.

Corresponding author. E-mail: meva.demir@atauni.edu.tr.

INTRODUCTION

Life satisfaction is the degree to which individuals subjectively evaluate the general quality of their life and is considered to be closely related to functionality in certain areas, such as work, family, and school (Diener and Diener, 1995). Life satisfaction was shown to be an important indicator of subjective well-being in a university sample (Almeida et al., 2002). Studies conducted in recent years have focused on university students' satisfaction with their academic life rather than their general life satisfaction (Balkıs and Duru, 2016; Odacı et al., 2021). Academic life satisfaction (ALS) includes students' attitudes toward and positive feelings about learning activities (Nogueira et al., 2019). Students who have a high level of satisfaction are keener on learning, attend classes regularly, focus more on educational activities, adapt to educational environments more easily, and strive more for success (Tessema et al., 2012).

University students are faced with developmental tasks, such as adapting to new learning strategies, creating an identity, validating the created identity, establishing close social relationships with family, teachers, friends, and the opposite sex, strengthening their professional identity, developing themselves during higher education, having a profession after the university education, starting a family, and having a position in adult life (Lee and Durksen, 2021). These developmental tasks bring various sources of stress, and it can be said that university students who try to cope with these stressors experience academic problems as well as various emotional and social problems (Odacı et al., 2021). One of the most important of these academic problems is dissatisfaction with academic life. Grit, which can be defined as individual strive to achieve one's goals despite many problems (Duckworth et al., 2007), increases life satisfaction (Clark and Malecki, 2019) and contributes to academic well-being (Datu et al., 2019), on one hand, affects academic life satisfaction. School engagement, which refers to having high resilience, not getting tired quickly, being patient to work, and not giving up when faced with obstacles is affected by grit (Hoferichter and Raufelder, 2023) and affects life satisfaction (Lewis et al., 2011). Therefore, it can be thought that school engagement has a mediating role between grit and academic life satisfaction. In this context, the correlation between ALS and grit and school engagement was planned to be examined in the present research.

Described as a personality characteristic, grit involves working with passion and patience to reach long-standing goals despite difficulties (Duckworth et al., 2007). Learning from experiences, especially from

mistakes, is a characteristic of people who have grit. They consider barriers as a means to achieve success. Grit, which is a significant non-cognitive component that helps individuals maintain their cognitive and daily functionality, has a significant function in becoming successful in various areas, including education (Christopoulou et al., 2018). It brings affirmative results in various learning and teaching environments and has a positive correlation with life satisfaction (Clark and Malecki, 2019). Grit increases well-being in various contexts and is associated with success (Datu et al., 2019).

High levels of achievement and well-being are associated with grit. It helps students avoid burnout, decreases the likelihood of dropping out, and increases their commitment to learning. It develops over time and is closely related to life satisfaction and well-being (Kang, 2018). Also, it makes individuals feel good in their lives by satisfying their psychological needs and prevents students who try hard to be successful from wearing out because individuals who have an intense passion for work and are motivated by this passion can work patiently to fulfill a difficult or boring task. Students with grit get higher grades, have higher academic performance, and are more successful, flexible, and resilient than the other students (Duckworth and Quinn, 2009). These individuals continue to work when others give up. They work patiently to reach their higher objectives despite obstacles (Duckworth and Gross, 2014). The most predictive variable for achieving personally meaningful goals was found as grit in a study (Sheldon et al., 2015). Having grit means gaining awareness of the significant objectives, worth the labor, and a source of life satisfaction. Individuals with grit who have healthy coping skills to manage negative events are more positive thinkers and hopeful. Therefore, individuals with grit are less likely to use compensatory coping skills to overcome negative events (Sheldon et al., 2015).

Grit is theoretically treated as a high-level factor with two subcomponents. These subcomponents are consistency of interest and pervesence of effort (Duckworth and Quinn, 2009). They are important predictors of successful performance in an educational environment. Perseverance of effort points to an inclination towards working hard despite obstacles and consistency of interest to an inclination to maintain interest over time. However, some studies conducted in recent years have presented different findings on the factor structure of grit. These studies provide evidence for the grit with two factors. The two sub-dimensions of grit have a different correlation with behavioral results (Bowman et al., 2015). For example, academic performance and cognitive ability are not predicted by the consistency of interest factor as much as they are by the perseverance of effort factor (Kalia et al., 2018). In addition, individuals who get high scores from the perseverance of effort experience less stress and negative emotions. Individuals who score low on the grit of effort have lower life satisfaction than those who score low on the consistency of interest. More importantly, combining the scores on these two factors to obtain a total grit score reduces the predictive power of grit scores (Crede et al., 2017). In addition, the grit of effort also expresses the tendency of students not to give up, despite facing many obstacles (Duckworth and Quinn, 2009). The tendency of students to continue school-related tasks in the face of difficulties may evoke the concept of school engagement (Hodge et al., 2018). So much so that school engagement is described as how much students are actively and determinedly engaged in reaching activities through their thoughts, emotions, and behaviors (Karababa, 2020).

School environment affects school engagement. Policymakers, researchers, and educators are increasingly focusing on encouraging student engagement to achieve affirmative school outcomes. Engagement is a multidimensional course that includes mental effort (cognition), active participation (behavior), and emotional investment (emotion). The conceptualization of school engagement, which had a one-dimensional structure at the beginning, has transformed into a more complicated many-sided formulation over time. Accordingly, triple conceptualization has become popular lately. This triple conceptualization has shown that school engagement has a multifaceted structure and includes behavioral, cognitive, and emotional aspects. Most scientists conceptualize school engagement as a many-sided component consisting of interrelated and reciprocally supportive behavioral, emotional, and cognitive aspects (Fredricks et al., 2004). Although they can be defined separately, the domains of engagement overlap and operate together to ensure engagement (Sinatra et al., 2015).

The three-factor comprehension also applies to students' school engagement. There are three different definitions of behavioral engagement, including (1) affirmative student behavior, such as obeying rules and instructions and avoiding disturbing behavior, (2) engagement in learning, for example asking questions, showing patience, concentration, attention, spending effort, and making contributions to classroom discussions, and (3) involvement in school- or extra-curricular activities. In other words, it is based on learning and involvement in social or extracurricular activities and affirmative behaviors (i.e., contribution to classroom discussions, involvement in school sporting events, and adherence to class and school norms). Behavioral engagement, which reflects a willingness to participate positively in school activities, includes positive behavior of the student, absence of disruptive behavior, participation in academic tasks, and spending efforts. An example of behavioral engagement is when students make eye contact with their teachers, spare time for their homework, or participate in sports activities at school (Sinatra et al., 2015). A second explanation is that affective engagement denotes a feeling of belonging as well as students' emotional responses to learning activities and their school. Affective school engagement arises when students emotionally participate in the process of learning and school activities and have interactions with their instructors and friends. According to Fredricks et al. (2004), affective engagement is based

on positive feelings about school. Affective engagement, which reflects students' feelings about school, includes students' emotional responses at school, identification with school, emotional responses toward school and teachers, a feeling of belongingness to school, being happy at school, being excited to be at school, and enjoying school activities (Li and Lerner, 2011). Third, cognitive engagement, being not observable and accepted as an intrinsic feature, is described as trying a lot of effort to learn a topic and making use of strategies of self-regulated education (Rotgans and Schmidt, 2011). Appreciating means the use of self-regulation strategies by students while expressing their appreciation for their own achievements in outcomes regarding school and the use of metacognitive strategies to plan, observe, and assess their learning outcomes and processes (Kang et al., 2021). The cognitive dimension is based on the eagerness to spend an effort on learning and grasping knowledge and skills such as choosing to work hard or affirmative coping if failure is experienced. Cognitive engagement, which is about the eagerness of students to make an effort to concentrate on learning, includes their aspiration to move beyond the minimum requisites, values and thoughts about learning and education, and strategic learning (Li and Lerner, 2011). Cognitive engagement denotes the psychological investment of students in their own process of learning. Examples of cognitive engagement include regulating attention to remain focused on learning tasks, associating the newly learned with the previously learned, and desire to be successful in other academic or school-related tasks (Sinatra et al., 2015). As a result, the triple representation of school engagement fully embraces the degree of student involvement in school, school engagement, and devotion to school (Li and Lerner, 2011).

Despite studies that classify school engagement as cognitive, affective, and behavioral, the classification of Schaufeli et al. (2006) is often used in studies about higher education. In this study, the classification of Schaufeli et al. (2006) was used. In this classification, school engagement is considered a persistent and pervasive internal state. This classification makes it possible to correctly examine the relationship between school engagement and strong cognitive and affective concepts such as grit and ALS. In addition, in the discussion part of this research, school engagement is discussed as a concept that is predominantly cognitive and affective. Therefore, the discussion section of this research should be examined with this conceptual perspective in mind.

School engagement includes a positive and satisfying mental situation about school and includes three main dimensions, namely absorption, dedication, and vigor (Schaufeli et al., 2006). These three domains can be explained as follows. First, vigor is students' eagerness to spend more effort in learning activities. It also includes students' resilience in academic activities, high levels of energy, and effort in overcoming academically difficult situations. Second, dedication is characterized by powerful participation in activities of learning while one experiences emotions, such as inspiration, pride, enthusiasm, and importance (Bakker et al., 2015). Lastly, absorption refers to a mental state where the person cannot separate himself/herself from studying which includes total focus and concentration. According to Schaufeli et al. (2006), these school engagement components are synonymous with the active involvement of students in learning activities. In this context, the school engagement abstraction of Schaufeli et al. (2006) can be considered more related to the affective dimension of engagement since it focuses on the internal state. However, Fredricks et al. (2016) stated that cognitive, affective, and behavioral engagement significantly overlapped with the domains of absorption, vigor, and dedication.

Many advantages can be obtained by the use of a multifaceted structure of school engagement rather than a one-dimensional one. The multifaceted abstraction of school engagement embraces various student characteristics. Thus, the multiple conceptualizations of school engagement can ensure a combined structure that connects various research fields. We can combine visions from various research areas for practical purposes thanks to the comprehensive aspects of school engagement. Secondly, we can examine the way how various kinds of engagement progress and interact via a multifaceted abstraction. Therefore, we can design more effective intervention programs by utilizing our understanding of the interactions between the kinds of school engagement. Third, we can obtain a full characterization of individuals via multifaceted abstraction and design intervention programs that target particular subpopulations based on this individual-centered method (Fredricks et al., 2004).

In this study, school engagement is considered a multidimensional construct. Addressing school engagement as multidimensional will provide a better understanding of the mediating role; this concept plays in the relationship between grit and ALS. In addition, considering the relationships between the sub-dimensions of school engagement and the latent variable of school engagement provides a clue as to which sub-dimensions should be taken into account more when designing intervention programs related to school engagement. Finally, the multidimensional approach of school engagement in this study will guide the organization of educational environments as it will better reveal the relationship between school engagement and other concepts in this research.

The affirmative perceptions of students about school environment and parental characteristics can increase school engagement levels (Van Ryzin, 2011). According to Woolley and Bowen (2007), teachers' ability to establish emotionally encouraging relationships with students improves students' school engagement over time. Berkowitz et al. (2017) reviewed 78 school climate studies and found that positive teacher-student interaction reduces the negative effects of socioeconomic difficulties that negatively affect young people’s school engagement and academic achievement. Archambault et al. (2017) determined that students who have close relationships with their teachers are more committed to the school. In other

words, closeness in student-teacher relations protects students from being disengaged from school. Gao et al. (2021) revealed that teacher-student relationships affect school engagement and this relationship differs according to basic psychological needs (autonomy, relatedness, and competence). Hughes and Kwok (2007) found that when students perceive their relationship with their teachers as close and positive, they can work harder, have more courage to overcome difficulties and devote themselves completely to learning by accepting teachers' guidance and criticism. Roorda et al. (2017) reported that teacher support in all cultures increased school engagement in a meta-analysis study in which they analyzed 189 studies. Resilience studies conducted with refugee, financially disadvantaged, bullied, or neglected youth have shown that compassionate educators are also very significant for vulnerable young individuals. For example, compassionate teachers have a significant part to play in maintaining the school engagement of youth facing economic vulnerability, stigma, and exposure to neglect or abuse. Teachers display compassionate behaviors that help students increase their self-esteem, gain access to basic resources, and respond to their engagement requirements to maintain their school engagement (Woolley and Bowen 2007).

The family context, which includes the financially and morally supportive behaviors of the caregiver, is an important factor affecting the school engagement of the youth (Woolley and Bowen, 2007), as well as being related to psychological resilience (Çıtak et al., 2023). Similarly, a low level of school engagement is observed in young people with negative parental expectations and low levels of parental support. Conversely, authoritarian and supportive parenting is often linked to higher school engagement levels over time. Parents with a good level of education, especially mothers, will possibly do affirmative parenting than uneducated or less educated parents. The effect of positive parenting practices on school engagement has been demonstrated by various studies (Woolley and Bowen, 2007). Another factor affecting students' school engagement is peer relationships. Various studies have shown that young people confirmed by their friends have more school engagement levels than those who are not. Students tend to imitate the positive behaviors of their peers when they establish and maintain connections with high-achieving peers who are engaged in school (Wang and Hofkens, 2020).

When the studies examining the relationship between grit and school engagement were examined, Muenks et al. (2017) showed that gritty individuals easily focus on their work and that grit is highly related to school engagement. Muenks et al. (2017) discussed school engagement in two dimensions emotional and behavioral school engagement. Behavioral and emotional engagement includes active, goal-oriented, flexible, constructive, persistent, focused efforts and emotionally positive interactions with social and physical environments. Muenks et al. (2017) found that the dimension of perseverance of effort coincided with behavioral engagement in their study with high school and college students. Li and Zhu (2022) examined the relationships between peer victimization, problematic internet game use, school engagement, and grit in their study with 2116 adolescents. In the study of Li and Zhu (2022), it was determined that school engagement mediated the relationship between peer victimization and problematic internet game use. In addition, the study found that grit buffered the effects of peer victimization and school engagement on problematic internet game use. In a longitudinal study conducted with 142 bilingual primary school students, O'Neal (2018) determined that emotional engagement played a mediating role in the effect of stress on students' literacy, but grit did not play a mediating role in this relationship. Kareem et al. (2023), in their study with 1774 students, revealed that class engagement plays a mediating role in the relationship between academic grit and well-being and between intolerance of uncertainty and well-being.

When the relationships between school engagement and ALS were examined, Rathakrishnan et al. (2022) found that individuals with high academic self-efficacy perception, who feel engaged in school and have good interpersonal relationships have higher life satisfaction in their study conducted with 400 college students. Lewis et al. (2011) conducted a longitudinal study with 779 high school students in which they measured twice for 5 months and found that increased life satisfaction of adolescents led to an increase in their cognitive, emotional and behavioral engagement. In a longitudinal study conducted by Shochet et al. (2006) with 2022 adolescents aged 12 to 14 years, it was observed that a decrease in school engagement increased negative emotions such as depression and anxiety. According to the findings obtained from the research in question, it can be said that an increase in student engagement can predict increases in adolescents' life satisfaction.

Examining the relationship between grit and ALS, Credé et al. (2017) determined that grit is related to life satisfaction in their meta-analysis study on grit. Credé et al. (2017) found that the dimension of perseverance of effort is more related to life satisfaction than the dimension of consistency of interest. Datu et al. (2016) found that the dimension of perseverance of effort is related to life satisfaction, whereas the dimension of consistency of interest is not related to life satisfaction. Oriol et al. (2017) found that grit was positively associated with school satisfaction when academic self-efficacy and self-control were controlled in a study conducted with a large Peruvian sample. In the study conducted by Bowman et al. (2015), it was revealed that the dimension of perseverance of effort is related to school satisfaction, whereas the dimension of consistency of interest is not related to school satisfaction. In their study with high school students, Ivcevic and Brackett (2014) found that grit was related to school satisfaction. In addition, these researchers state that grit is related to having a positive perception of school. They attribute this relationship to low-level internalization problems of gritty students, low-level hyperactivity of gritty students, low-level learning problems of gritty students, and low-level inattention of gritty students.

This research was designed to investigate whether school engagement mediated the correlation between grit and ALS. This research is the first to examine the role of school engagement in the relationship between grit and ALS. Previous research has focused on the relationship between the concepts of grit and school engagement, and life satisfaction and school satisfaction. In other words, they focused on life satisfaction and school satisfaction rather than ALS. In this respect, this research is the first to focus on ALS. Another aspect of this research that differs from previous research lies in the conceptualization of school engagement. In studies examining the relationship between school engagement and educational concepts, school engagement has been classified as cognitive, emotional and behavioral engagement. However, in higher education studies, it is suggested to use a conceptualization in which school engagement is dimensioned as vigor, dedication and absorption (Chukwuedo, Mbagwu and Ogbuanya, 2021; Snijders, Wijnia, Rikers and Loyens, 2020). Therefore, this research is the first to examine the relationship between grit and ALS and school engagement using this conceptualization of school engagement.

Students with high school engagement have a high level of grit want to be involved in educational activities strongly, take part in educational activities enthusiastically, are motivated to learn, and are fully concentrated on the educational activities they are engaged in (Schaufeli & Bakker, 2004). School engagement is affected by students' self-perceptions, experiences, and perceived teacher and peer support. The interaction of these components with students' academic goals, motivations, values, and self-perceptions results in school engagement. An affirmative learning environment, peer support, and relationships with teachers increase the motivation of students via affirmative social experiences. Increased student motivation and grit results in increased school engagement (Patrick et al., 2007). It is thought that students' school engagement is associated with ALS, which includes positive feelings towards the learning process (Nogueira et al., 2019). Students with high ALS are more willing to learn, concentrate more on educational activities, and strive more for success (Balkıs and Duru, 2016; Tessema et al., 2012). In addition, students with high ALS are motivated to learn and feel valued and hopeful about their educational future (Singh et al., 2022). These characteristics of individuals with high ALS may result in increased school engagement.

In this study, it was assumed that a high degree of grit might lead to school engagement and that a high degree of school engagement might result in a high degree of ALS. Considering that students having ALS are more willing to learn and strive more for success (Tessema et al., 2012), it can be said that grit increases ALS. Grit includes studying passionately and devotedly to achieve long-lasting goals. People who have grit are determined to overcome barriers and continue to strive even if they fail. As stated by Duckworth et al. (2007), individuals see barriers as an opportunity to get success. Of the students with the same intelligence levels, those who had grit were more successful (Duckworth et al., 2007). Leading to success in various academic settings, grit helps students avoid burnout and increases their commitment to learning. Individuals with grit have an intense passion for academic studies and can study patiently even to fulfill difficult tasks (Datu et al., 2019). Therefore, it can be said that grit increases school engagement. Therefore, in this study, it is questioned whether school engagement has a mediating role in the relationship between grit and academic life satisfaction. In light of the research question, the hypotheses tested in this study can be listed as follows:

1. Grit is a positive and significant predictor of ALS.
2. Grit is a positive and significant predictor of school engagement.
3. School engagement is a positive and significant predictor of ALS.
4. School engagement plays a significant mediating part between grit and ALS.

METHOD

Research design

A correlational survey design based on a quantitative research methodology was used in the study to examine whether the correlation between grit and ALS was mediated by school engagement. Correlational designs are used to reveal the relationships between two or more variables (Fraenkel et al., 2012). ALS was employed as a dependent variable and grit was employed as an independent variable. Also, school engagement was employed as a mediator variable. Accordingly, a mediation model was established to reveal whether the correlation between grit and ALS was mediated by school engagement.

Participants

The study took place in the science and letters and educational faculties of a state university in the eastern Anatolia region in Turkey. Four hundred and eighty-seven students, including 316 (65%) females and 171 (35%) males were recruited. Of the students, 153 (31%) were from the faculty of science and letters, and 334 (69%) were from the faculty of education. The participants were in the 18-33 age range, with a mean age of 20.62 (SD = 2.04). The instruments were administered in Turkish to participants.

Instruments

Personal information form (PIF)

The form developed by the researchers in the research includes age, sex, and department of university students participating.

Academic life satisfaction scale (ALSS)

Developed by Nogueira et al. (2019), the ALSS was utilized in this research to obtain data about the ALS levels of university students. Odacı et al. (2021) performed its Turkish adaptation study. The scale comprises 8 items under two factors, each of which has 4 items: satisfaction with the academic environment and personal satisfaction. It is graded on a 5-point Likert-type scale. It is possible to get 8 to 40 points on the scale. A high score denotes better ALS. Cronbach's alpha values were found to be α = .72, α = .74, α = .80 (for the personal satisfaction domain factor, the satisfaction with the academic environment domain factor, and the total measure) (Nogueira et al., 2019). In the adaptation study, the internal consistency-based reliability coefficient was .78 for the personal satisfaction domain factor, .73 for the satisfaction with the academic environment domain factor, and .82 for the total measure (Odacı et al., 2021). In the current study, the total measure was found to have an internal consistency coefficient of .82.

Short grit scale (GRIT-S)

Duckworth and Quinn (2009) created this measure. Sarıçam et al. (2016) did a Turkish reliability and validity study. The eight items on the scale are evaluated on a five-point Likert-type assessment construct. Four of the questions are scored reversely. The degree of grit is measured by using the two subscales, each of which has 4 items: perseverance of effort and consistency of interest. Higher scores obtained from both subscales and the total measure show high levels of grit. Internal consistency coefficients were .78 for perseverance of effort and .70 for consistency of interest (Duckworth and Quinn, 2009). Exploratory and confirmatory factor analyses conducted during adaptation confirmed the validity of the two dimensions statistically. The internal consistency-based reliability coefficient was .83 for the total measure (Sarıçam et al., 2016). This value was .66 for the total measure in our research.

Utrecht work engagement scale-student form (UWES-SF)

Schaufeli and Bakker (2004) developed the UWES-SF. This scale was utilized to collect data about the individuals' engagement levels in this study. Çapri et al. (2017) adapted the scale into Turkish. It comprises 9 items and three subscales, each of which is made up of 3 items: absorption, vigor, and dedication. A high score shows increased work engagement. The analyzed reliability coefficients for the reliability were .73 for vigor, .76 for dedication, .70 for absorption, and .84 for the total scale (Schaufeli and Bakker, 2004). The adapted version had internal consistency values of .72 to .88 (Çapri et al., 2017). This coefficient was .90 for the total scale in the current study.

Data collection procedures

Firstly, the necessary permissions were obtained from the researchers who adapted or developed the scales to be used in the study to Turkish and from the Ethics Committee. E. 88656144-000-2200049999 numbered ethics committee permission was obtained from Atatürk University on 14.02.2022. An online form including the instruments to be used in the study was created by the researcher on Google Forms.

An informed consent form, which included detailed explanations about the research, was presented to the participants. In addition, it was stated on the first page of the form that participants' data would not be shared with third parties and that joining the research was voluntary. Participants filled out the forms sent through the university information system or online courses in about 15 minutes. As a result, the process was completed by administering instruments to 487 participants in total.

Data analysis

First, the data set was analyzed using frequency, minimum, and maximum values and it was examined for missing data. Then, data were checked for normality and outliers. Univariate outliers were analyzed via z-scores. Analyses were performed on the IBM SPSS software. The data set was determined to have no outliers. In addition, normality was also evaluated by using skewness and kurtosis values, which varied from –2 to +2, showing the data set had a normal distribution (George and Mallery, 2019). Multivariate outliers were examined by calculating the Mahalobonis distance coefficients (Tabachnick and Fidell, 2014). After determining that the data met the specified criteria, analyses were carried out on the existing data set obtained from 487 participants.

A correlation analysis was performed to investigate the variables, and significant relationships were determined. Then, the measurement and structural models, a two-step structural equation model, were employed to determine the mediating role of school engagement between grit and ALS. The test of the mediation model included the maximum likelihood estimation on AMOS Graphics. In addition, the significance of mediation analysis was tested with the bootstrapping method, which was suggested by Preacher and Hayes (2008). Thus, a sample size of 5000 was tested at a confidence interval of 95% with the reconstructed bootstrapping method, and more reliable results were reached with analyses on larger data sets produced by resampling (MacKinnon et al., 2004). These analyses were performed on the IBM SPSS 23.0 (IBM SPSS Statistics for Windows, IBM Corp., Armonk, NY, United States) and AMOS 23.0 software package programs.

FINDINGS

In this section, the relationship between grit, ALS and school engagement, and the mediating role of school

engagement in the relationship between grit and ALS are presented.

Descriptive statistics

Firstly, correlation analysis coefficients were calculated to search for relationships between ALS, grit, and school engagement. Table 1 shows the standard deviation, correlation, mean, kurtosis, and skewness values between the variables.

According to the correlation analysis, statistically significant positive relationships were found between ALS and grit ($r = .34$, $p < .001$) and school engagement ($r = .42$, $p < .001$). In addition to this finding, there was a statistically significant positive relationship between grit and school engagement ($r = .49$, $p < .001$).

Table 1. Comparison of correlations between the variables and descriptive statistics.

Variables	1. ALS	2. Grit	3. School Engagement
1. ALS	1		
2. Grit	.34***	1	
3. School Engagement	.42***	.49***	1
Min.	13.00	15.00	9.00
Max.	40.00	39.00	45.00
Mean	27.92	26.77	26.49
SD	5.21	4.22	7.27
Skewness	-.05	.19	.21
Kurtosis	-.15	.35	-.36

*p < .05, **p < .01, ***p < .001.

Measurement model testing

Fit values are considered the most important criteria for the assessment of structural equation models. First, the fit indices of the structural model should be examined. The χ^2/df value is a useful criterion for the suitability of the model, and an χ^2/df value of ≤3 in small samples and an χ^2/df value of ≤5 in large samples is an indication of a good fit of the model (Tabachnick and Fidell, 2014). Another fit index used in the evaluation of the model is the RMSEA value. It is acceptable for the RMSEA value in the model to be less than .08, and if it is less than .05, it indicates a perfect fit.

The other fit index, the SRMR fit index, is acceptable if it is smaller than .08, and its values of .05 or less indicate that the observed variables are in perfect agreement with the data obtained (Hu and Bentler, 1999). In addition, values of ≥.90 for CFI (Comparative Fit Index), GFI (Goodness of Fit Index), and TLI or NNFI (Non-normed Fit Index) indices show goodness of fit (Kline, 2016). The measurement model was analyzed in the current study and the fit indices were determined ($\chi2 = 24{,}381$; $df = 11$, $\chi^2/df = 2.22$, NFI = .98, GFI = .99, TLI = .98, CFI = .99, RMSEA = .050 and SRMR = .021). Results revealed that the measurement model and the data had a good fit. Accordingly, the structural model was tested.

Structural model testing

Analyses were made to test the hypotheses of the research. The first hypothesis of the study was tested and it was found that grit predicted ALS positively and statistically significantly ($ß = .56$, $p< .001$). The results of the model revealed that the model fitted well ($\chi2 = .712$; $df = 1$, $\chi^2/df = .712$, NFI = .99, GFI = .99, TLI = .99, CFI = .99, RMSEA = .001, and SRMR = .009). To test the other hypotheses, an analysis was made by adding a mediator variable to the model.

In the model, grit and school engagement directly affected ALS ($p < .001$). Additionally, the examination of the direct influence of grit on ALS indicated insignificance. The obtained fit indices ($\chi2 = 39.53$; $df = 12$, $\chi2/df = 3.29$, CFI = .98, NFI = .97, GFI = .98, TLI = .96, RMSEA = .069, and SRMR = .034) revealed that the model had goodness of fit (Tabachnick and Fidell, 2014). Figure 1 shows the final structural diagram.

Whether the mediating role of school engagement between grit and ALS was significant was tested with the bootstrap method. Table 2 indicates the primary and secondary paths and the values of these paths at a confidence interval of 95% and the standardized coefficients of the model.

Direct and indirect effects were examined according to the structural equation modeling (SEM). Accordingly, the direct effect of grit on school engagement was significant and positive ($λ = .80$, $p < .001$). In addition to this result, the direct effect of school engagement on ALS was positive and significant ($λ = .55$, $p < .001$). However, the direct effects of grit on ALS were found to be positive but statistically insignificant ($λ = .12$, $p = .457$). According to the results of the analyses, school engagement had a mediating role between grit and ALS, which was statistically significant since the confidence interval did not contain zero ($ß = .44$, confidence interval (.33, .57), $p < .001$). In addition, according to the results obtained from the structural model, 64% of the variance in the school engagement variable was explained by grit, while 31% of the variance in the ALS was explained by school engagement and grit. The

model revealed that university students who had a high level of grit might have more school engagement, and as a result, their ALS might be at a higher level. As a result, the mediating role of school engagement in the correlation between grit and ALS was tested and verified.

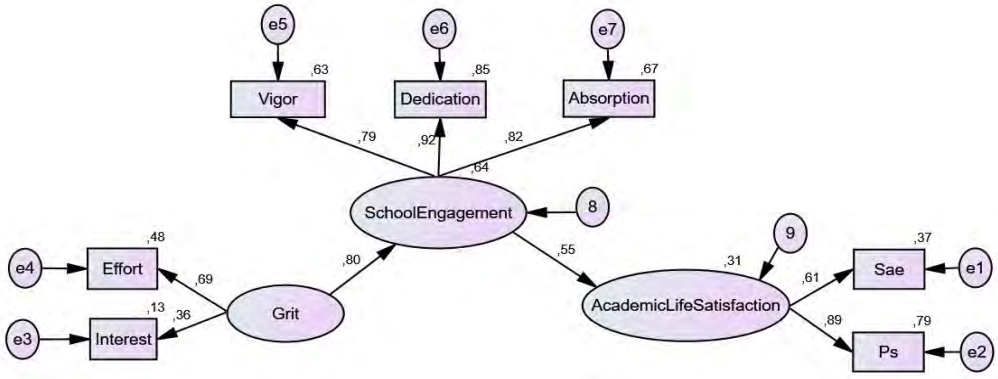

Figure 1. The final structural model.

Table 2. Standardized values and bootstrap confidence intervals of direct and indirect pathways.

Path	ß	Bias-corrected 95 % CI	
		Lower	Upper
Direct Effects			
Grit → School Engagement	.64	.53	.75
School Engagement → Academic Life Satisfaction	.82	.72	.90
Indirect Effect			
Grit → School Engagement → Academic Life Satisfaction	.53	.42	.62

DISCUSSION

In this study, the relationship between grit, school engagement, and academic life satisfaction was examined and the mediating role of school engagement in the relationship between grit and academic life satisfaction was examined. A direct correlation was found between grit and ALS, which was mediated by school engagement. That is, both grit and school engagement had a significant part in developing ALS. The findings are very valuable in terms of revealing the factors that had a significant part in developing ALS and the relationship mechanism between these factors.

First of all, it was found in this study that grit positively predicted ALS. In other words, hypothesis 1 was confirmed. ALS is defined as the satisfaction that an individual hopes to obtain from school life by fulfilling important academic goals (Nogueira et al., 2019). According to Clark and Malecki (2019), grit, which means working patiently to achieve goals despite many difficulties, increases life satisfaction. Datu et al. (2019) also argue that grit increases academic well-being. Therefore, this finding is similar to studies dealing with the effect of grit on life satisfaction and academic well-being. In addition, students' dedication to their education and willingness to continue their education under any circumstances increases ALS. On the other hand, it is known that students who have less desire and motivation to attend classes have low ALS levels (Tessema et al., 2012). In other words, students with high ALS are eager to learn and strive more for success (Balkıs and Duru, 2016). In addition, there are many studies in the literature in which grit affects life satisfaction (Datu et al., 2022; Ekinci and Koç, 2023). Therefore, it is possible to say that students who have high levels of grit and strive for success continuously will have more ALS. Research into the correlation between grit and ALS also supports this finding (Bowman et al., 2015).

Second, it was found in this study that grit positively predicted school engagement. In other words, hypothesis 2 was confirmed. This predictive relationship can be better understood when the sub-dimensions of grit and school engagement are analyzed. Grit is made up of two factors, namely perseverance of effort and consistency of interest. The result regarding the effect of grit on school engagement is similar to many studies (Lee and Ha, 2022; Sadoughi and Hejazi, 2023). The perseverance of effort dimension indicates a propensity to continue spending efforts toward goal-seeking despite encountering difficulties and barriers (Duckworth and Quinn, 2009). School engagement includes three sub-dimensions, namely absorption, dedication, and vigor. The vigor sub-dimension means having a high level of resilience and energy, eagerness to put effort into work, not getting tired easily, and showing perseverance even

when faced with difficulties. Therefore, the overlap between perseverance of effort and vigor may be the source of the predictive correlation between school engagement and grit.

Third, it was determined that school engagement predicted ALS positively. In other words, hypothesis 3 was confirmed. Studies dealing with the relationship between school engagement and life satisfaction (Lewis et al., 2011) and academic activity (Lyons and Huebner, 2016) are in line with the findings of the current study. This finding is parallel to the studies in the literature (Liu et al., 2023; Teuber et al., 2021). According to Ouweneel et al. (2013), school engagement includes the time students devote to educational activities and the quality of their learning efforts. Students who are engaged in school see seeking help as an effective strategy when faced with difficulties. Thus, they get higher grades and adapt to school better. They enjoy being at school and are proud, inspired, and enthusiastic when participating in learning activities, have resilience, are energetic, put more effort into accessing study resources, focus on learning activities, use reflective learning, are optimistic about learning, and do not neglect their tasks. In addition, students with school engagement have high self-efficacy. Considering all these positive experiences regarding education life, the prediction of ALS by school engagement can be seen as an understandable finding. So much so that Nogueira et al. (2019) also describe ALS as a situation that reflects students' positive attitudes toward learning activities.

Finally, it was found that the correlation between grit and ALS was mediated by school engagement, which indicated that hypothesis 4 was confirmed. This finding can be interpreted as follows: Students with high grit have more ALS when they are engaged in school. Grit and school engagement are likely associated for various reasons. Many researchers have found that school satisfaction and grit are associated (Bowman et al., 2015). Students with grit, who study passionately and devotedly to achieve future objectives, study with intense determination to overcome the barriers that they encounter (Duckworth et al., 2007). This motivation, which students with grit have, (Sarıçam et al., 2016) may result in increased school engagement. Students with high motivation are more engaged in school (Singh et al., 2022). Another reason for the high level of school engagement of students with grit may be their high self-efficacy (Özhan, 2021). Students with self-efficacy and grit participate in learning activities voluntarily and willingly, make great efforts for learning activities, use effective ways by showing long-term resistance and patience against academic difficulties, show positive attitudes towards school, and exhibit high academic performance (Usher et al., 2019). These characteristics of students with grit and high self-efficacy may result in increased school engagement. The ability of students with grit to easily adapt to school, cope effectively with stressful life events, and show high academic performance prevents them from experiencing school burnout (Özhan, 2021). Reducing school burnout may lead to increased school engagement. As a matter of fact, according to the model of work resources and demands, the tendency of individuals to work and their energy and enthusiasm to perform better reduces burnout. Decreased burnout also increases work engagement (Singh et al., 2022). Fulfilling school-related tasks and emotionally making commitments in school-related activities also increase academic satisfaction (Schaufeli et al., 2006). Therefore, the conclusion that grit has an indirect effect on ALS through school engagement is supported by the cited studies.

Indicating important findings on the correlations between grit, ALS, and school attachment, this research has several limitations. First, due to using correlational data, causal inferences could not be made. Secondly, the data obtained from this study on ALS, grit, and school engagement was collected using self-report measurement tools. Third, this study was conducted with university students in Turkish culture. Therefore, care should be taken when conducting the results on different cultures and different age groups.

CONCLUSION AND RECOMMENDATIONS

According to our results, school engagement has a mediating role between grit and ALS. These findings may provide a new perspective to educators who are trying to increase students' ALS. It can be said that it is necessary to focus on ALS, especially in the guidance programs provided under medico-social services at universities. In addition, it can be stated that new research on grit and school engagement will contribute to the development of students' level of engagement in school.

Various recommendations can be made in line with this research. First of all, experimental and longitudinal studies to make causal inferences may be conducted. Secondly, conducting new studies in different age groups and different cultures, especially in adolescents, will increase the generalizability of our results. Third, utilizing peer and parent-report assessment methods instead of self-report assessment tools will help better grasp the relationships between school engagement, ALS, and grit. Fourth, it would be useful to develop and test the effectiveness of school-based intervention programs that focus on ALS, grit, and school engagement. Finally, it can be recommended to conduct new studies on the investigation of the relationships between the concepts examined in this study and include different variables, using sequential mediation and moderated mediation.

REFERENCES

Almeida, L. S., Soares, A. P., and Ferreira, J.A. (2002). Academic Experience Questionnaire (QVA-r): Evaluation of the adjustment of university students. *Psychological Assessment, 1*(2), 81–93.

Archambault, I., Vandenbossche-Makombo, J., and Fraser, S. L. (2007). Students' oppositional behaviors and engagement in school: The differential role of the student-teacher relationship. *Journal of Child and Family Studies, 26*(6), 1702-1712. https://doi.org/10.1007/s10826-017-0691-y

Bakker, A. B., Vergel, A. I. S., and Kuntze, J. (2015). Student engagement and performance: a weekly diary study on the role of

openness. *Motivation and Emotion, 39*, 49-62. https://doi.org/10.1007/s11031-014-9422-5

Balkıs, M., and Duru, E. (2016). Procrastination, self-regulation failure, academic life satisfaction, and affective well-being: Under regulation or misregulation form. *European Journal of Psychology of Education, 31*(3), 439–459. https://doi.org/10.1007/s10212-015-0266-5

Berkowitz, R., Moore, H., Astor, R. A., and Benbenishty, R. (2017). A research synthesis of the associations between socioeconomic background, inequality, school climate, and academic achievement. *Review of Educational Research, 87,* 425–469. https://doi.org/10.3102/0034654316669821

Bowman, N. A., Hill, P. L., Denson, N., and Bronkema, R. (2015). Keep on truckin' or stay the course? Exploring grit dimensions as differential predictors of educational achievement, satisfaction, and intentions. *Social Psychological and Personality Science, 6*(6), 639–645. https://doi.org/10.1177/1948550615574300

Christopoulou, M., Lakioti, A., Pezirkianidis, C., Karakasidou, E., and Stalikas, A. (2018). The role of grit in education: A systematic review. *Psychology, 9*(15), 2951–2971. https://doi.org/10.4236/psych.2018.915171

Chukwuedo, S. O., Mbagwu, F. O., and Ogbuanya, T. C. (2021). Motivating academic engagement and lifelong learning among vocational and adult education students via self-direction in learning. *Learning and Motivation, 74*(101729), 1-12. https://doi.org/10.1016/j.lmot.2021.101729

Clark, K. N., and Malecki, C. K. (2019). Academic grit scale: Psychometric properties and associations with achievement and life satisfaction. *Journal of School Psychology, 72*, 49–66. https://doi.org/10.1016/j.jsp.2018.12.001

Cred´e, M., Tynan, M. C., and Harms, P. D. (2017). Much ado about grit: A meta-analytic synthesis of the grit literature. *Journal of Personality and Social Psychology, 113*(3), 492–511. https://doi.org/10.1037/pspp0000102

Çapri, B., Gündüz, B., and Akbay, S. E. (2017). Utrecht Work Engagement Scale-Student Forms' (UWES-SF) adaptation to Turkish, validity and reliability studies, and the mediator role of work engagement between academic procrastination and academic responsibility. *Educational Sciences: Theory & Practice, 17*(2), 411–435. https://doi.org/10.12738/estp.2017.2.0518

Çıtak, Ş., Kanbur, S., and Kurşuncu, M. A. (2023). The mediating role of sibling relationships in the relationship between parental achievement support and pressure and psychological resilience. *International Journal of Psychology and Educational Studies, 10*(3), 773-786. https://doi.org/10.52380/ijpes.2023.10.3.1210

Datu, J. A. D., King, R. B., Valdez, J. P. M., and Eala, M. S. M. (2019). Grit is associated with lower depression via meaning in life among Filipino high school students. *Youth & Society, 51*(6), 865–876. https://doi.org/10.1177/0044118x18760402

Datu, J. A. D., Valdez, J. P. M., and King, R. B. (2016). Perseverance counts but consistency does not! Validating the Short Grit Scale in a collectivist setting. *Current Psychology: A Journal for Diverse Perspectives on Diverse Psychological Issues, 35*(1), 121-130. https://doi.org/10.1007/s12144-015-9374-2

Datu, J. A. D., Yuen, M., Fung, E., Zhang, J., Chan, S., and Wu, F. (2022). The satisfied lives of gifted and gritty adolescents: Linking grit to career self-efficacy and life satisfaction. *The Journal of Early Adolescence, 42*(8), 1052-1072. https://doi.org/10.1177/027243162210960

Diener, E., and Diener, M. (1995). Cross-cultural correlates of life satisfaction and self-esteem. *Journal of Personality and Social Psychology, 68,* 653-663. https://doi.org/10.1037/0022-3514.68.4.653

Duckworth, A. L., and Gross, J. J. (2014). Self-control and grit: Related but separable determinants of success. *Current Directions in Psychological Science, 23*(5), 319–325. https://doi.org/10.1177/0963721414541462.

Duckworth, A. L., Peterson, C., Matthews, M. D., and Kelly, D. R. (2007). Grit: Perseverance and passion for long-term goals. *Journal of Personality and Social Psychology, 92*(6), 1087–1101. https://doi.org/10.1037/0022-3514.92.6.1087

Duckworth, A. L., and Quinn, P. D. (2009). Development and validation of the Short Grit Scale (Grit-S). *Journal of Personality Assessment, 91*(2), 166–174. https://doi.org/10.1080/ 00223890802634290

Ekinci, N., and Koç, H. (2023). Grit, general self-efficacy, and life satisfaction: The mediating role of hope. *Journal of Community Psychology, 51*(3), 1288-1299. https://doi.org/10.1002/jcop.22962

Fraenkel, J. R., Wallen, N. E., and Hyun, H. H. (2012). *How to design and evaluate research in education*. McGraw-Hill Humanities/Social Sciences/Languages.

Fredricks, J. A., Blumenfeld, P. C., and Paris, A. H. (2004). School engagement: Potential of the concept, state of the evidence. *Review of Educational Research, 74*(1), 59–109. https://doi.org/10.3102/00346543074001059

Fredricks, J. A., Filsecker, M., and Lawson, M. A. (2016). Student engagement, context, and adjustment: addressing definitional, measurement, and methodological issues. *Learning and Instruction, 43,* 1–4. https://doi.org/10.1016/j.learninstruc.2016.02.002

Gao, Q., Bao, C., Du, H., and Yan, R. (2021). The mediating role of basic psychological needs satisfaction in the relationship between teacher-student relationships and academic engagement in China. *Asia Pacific Journal of Education, 43*(2), 514-525. https://doi.org/10.1080/02188791.2021.1933380

George, D., and Mallery, P. (2019). *IBM SPSS statistics 25 step by step: A simple guide and reference* (15th ed.). Routledge.

Hodge, B., Wright, B., and Bennett, P. (2018). The role of grit in determining engagement and academic outcomes of university students. *Research in Higher Education, 59*, 448-460. https://doi.org/10.1007/s11162-9474-y

Hoferichter, F., and Raufelder, D. (2023). Biophysiological stress markers relate differently to grit and school engagement among lower- and higher-track secondary school students. *British Journal of Educational Psychology, 93,* 174–194. https://doi.org/10.1111/bjep.12514

Hu, L. T., and Bentler, P. M. (1999). Cutoff criteria for fit indexes in covariance structure analysis: Conventional criteria versus new alternatives. *Structural Equation Modeling: A Multidisciplinary Journal, 6*(1), 1–55. https://doi.org/10.1080/10705519909540118

Hughes, J. N., and Kwok, O. M. (2007). Influence of student-teacher and parent-teacher relationships on lower achieving readers' engagement and achievement in the primary grades. *Journal of Educational Psychology, 99*(1), 39-51. https://doi.org/10.1037/0022-0663.99.1.39

Ivcevic, Z., and Brackett, M. (2014). Predicting school success: Comparing conscientiousness, grit, and emotion regulation ability. *Journal of Research in Personality, 52*, 29-36. https://doi.org/10.1016/j.jrp.2014.06.005

Kalia, V., Thomas, R., Osowski, K., and Drew, A. (2018). Staying alert? Neural correlates of the association between grit and attention networks. *Frontiers in Psychology, 9*. Article 1377. https://doi.org/10.3389/fpsyg.2018.01377

Kang, S. W. (2018). Nursing students' grit: A cross-sectional study. *Advances in Social Sciences Research Journal, 5*(10), 127–131. https://doi.org/10.14738/assrj.510.5303

Kang, D., Stough, L. M., Yoon, M., and Liew, J. (2021). The structural association between teacher-student relationships and school engagement: Types and informants. *International Journal of Educational Research Open, 2,* 1-11. https://doi.org/10.1016/j.ijedro.2021.100072

Karababa, A. (2020). The reciprocal relationships between school engagement and self-esteem among Turkish early adolescents: A three-wave cross-lagged model. *Children and Youth Services Review, 116*, 1-9. https://doi.org/10.1016/j.childyouth. 2020. 105114

Kareem, J., Thomas, S., Kumar, A. P., and Neelakantan, M. (2023). The role of classroom engagement on academic grit, intolerance to uncertainty and well-being among school students during the second wave of the COVID-19 pandemic in India. *Psychology in the Schools, 60*, 1594-1608. https://doi.org/10.1002/pits.22578

Kline, R. B. (2016). *Principles and practice of structural equation modeling*. The Guilford Press.

Lee, J., and Durksen, T. L. (2021). Global Academic Interest Scale for undergraduate and graduate students. *Journal of Psychoeducational Assessment, 39*(2), 182-196. https://doi.org/10.1177/0734282920946144

Lee, M., and Ha, G. (2022). The role of peer relationships among elementary school students: Focusing on the mediation effects of grit depending on teacher-student relationships. *Current Psychology*, 1-10. https://doi.org/10.1007/s12144-022-03359-6

Lewis, A. D., Huebner, E. S., Malone, P. S., and Valois, R. F. (2011). Life satisfaction and student engagement in adolescents. *Journal of Youth and Adolescence, 40*, 249–262. https://doi.org/10.1007/s10964-010-9517-6

Li, Y., and Lerner, R. M. (2011). Trajectories of school engagemen during adolescence: Implications for grades, depression,

delinquency, and substance use. *Developmental Psychology, 47*(1), 233–247. https://doi.org/10.1037/a0021307

Li, L., and Zhu, J. (2022). Peer victimization and problematic internet game use among Chinese adolescents: A moderated mediation model of school engagement and grit. *Current Psychology: A Journal for Diverse Perspectives on Diverse Psychological Issues*, 41(4),1943-1950. https://doi.org/10.1007/s12144-020-00718-z

Liu, A., Chen, Z., Wang, S., Guo, J., and Lin, L. (2023). Relationships Between College Students' Belief in a Just World and Their Learning Satisfaction: The Chain Mediating Effects of Gratitude and Engagement. *Psychology Research and Behavior Management, 16,* 197-209. https://doi.org/10.2147/PRBM.S396702

Lyons, M. D., and Huebner, E. S. (2016). Academic characteristics of early adolescents with higher levels of life satisfaction. *Applied Research in Quality of Life, 11*, 757–771. https://doi.org/10.1007/s11482-015-9394-y

MacKinnon, D. P., Lockwood, C. M., and Williams, J. (2004). Confidence limits for the indirect effect: Distribution of the product and resampling methods. *Multivariate Behavioral Research, 39*(1), 99–128. https://doi.org/10.1207/s15327906mbr3901_4

Muenks, K., Wigfield, A., Yang, J. S., and O'Neal, C. R. (2017). How true is grit? Assessing its relations to high school and college students' personality characteristics, self-regulation, engagement, and achievement. *Journal of Educational Psychology, 109*(5), 599-620. https://doi.org/10.1037/edu0000153

Nogueira, M. J., Antunes, J. P., and Sequeira, C. (2019). Development and psychometric study of the Academic Life Satisfaction Scale (ALSS) in a higher education students sample*. Nursing & Healthcare International Journal, 3*(2), 1–8. https://doi.org/10.23880/nhij-16000183

Odacı, H., Kaya, F., and Kınık, Ö. (2021). Turkish version of the Academic Life Satisfaction Scale. *Ege Journal of Education, 22*(1), 1–15. https://doi.org/10.12984/egeefd.793020

O'Neal, C. R. (2018). The impact of stress on later literacy achievement via grit and engagement among dual language elementary school students. *School Psychology International, 39*(2), 138-155. https://doi.org/10.1177/0143034317752519

Oriol, X., Miranda, R., Oyanedel, J. C., and Torres, J. (2017). The role of self-control and grit in domains of school success in students of primary and secondary school. *Frontiers in Psychology, 8*(1716), 1-9. https://doi.org/10.3389/fpsyg.2017.01716

Ouweneel, E., Le Blanc, P. M., and Schaufeli, W. B. (2013). Do-it-yourself: An online positive psychology intervention to promote positive emotions, self-efficacy, and engagement at work. *The Career Development International, 18*(2), 173–195. https://doi.org/10.1108/CDI-10-2012-0102

Özhan, M. B. (2021). Academic self-efficacy and school burnout in university students: Assessment of the mediating role of grit. *Current Psychology, 40*, 4235–4246. https://doi.org/10.1007/s12144-021-02023-9

Patrick, H., Ryan, A. M., and Kaplan, A. (2007). Early adolescents' perceptions of the classroom social environment, motivational beliefs, and engagement. *Journal of Educational Psychology, 99*(1), 83–98. https://doi.org/10.1037/0022-0663.99.1.83

Preacher, K. J., and Hayes, A. F. (2008). Asymptotic and resampling strategies for assessing and comparing indirect effects in multiple mediator models. *Behavior Research Methods, 40*, 879–891. https://doi.org/10.3758/BRM.40.3.879

Rathakrishnan, B., Singh, S. S. B., Yahaya, A., Kamaluddin, M. R., Ibrahim, F., and Rahman, Z. A. (2022). Academic stress and life satisfaction as social sustainability among university students*. International Journal of Evaluation and Research in Education, 11*(4), 1778-1786. https://doi.org/10.11591/ijere.v11i4.22682

Roorda, D. L., Jak, S., Zee, M., Oort, F. J., and Koomen, H. M. (2017). Affective teacher-student relationships and students' engagement and achievement: A meta-analytic update and test of the mediating role of engagement. *School Psychology Review, 46*(3), 239-261. https://doi.org/10.17105/SPR-2017-0035.V46-3

Rotgans, J. I., and Schmidt, H. G. (2011). Cognitive engagement in the problem-based learning classroom. *Advances in Health Sciences Education, 16*, 465-479. https://doi.org/10.1007/s10459-011-9272-9

Sadoughi, M., and Hejazi, S. Y. (2023). Teacher support, growth language mindset, and academic engagement: The mediating role of L2 grit. *Studies in Educational Evaluation, 77,* 101251. https://doi.org/10.1016/j.stueduc.2023.101251

Sarıçam, H., Çelik, İ., and Oğuz, A. (2016). Turkish adaptation of the Short Grit Scale: Validity and reliability study. *International Journal of Turkish Literature, Culture and Education, 5*(2), 927–935.

Schaufeli, W. B., and Bakker, A. B. (2004). Job demands, job resources, and their relationship with burnout and engagement: a multi-sample study. *Journal of Organizational Behavior, 25*, 293–315. https://doi.org/10.1002/job.248

Schaufeli, W. B., Bakker, A. B., and Salanova, M. (2006). The measurement of work engagement with a short questionnaire - a cross-national study. *Educational and Psychological Measurement, 66*(4), 701–716. https://doi.org/10.1177/0013164405282471

Sheldon, K. M., Jose, P. E., Kashdan, T. B., and Jarden, A. (2015). Personality, effective goal-striving, and enhanced well-being: Comparing 10 candidate personality strengths. *Personality and Social Psychology Bulletin, 41*(4), 575–585. https://doi.org/10.1177/0146167215573211

Shochet, I. M., Dads, M. R., Ham, D., and Montague, R. (2006). School connectedness is an underemphasized parameter in adolescent mental health: results of a community prediction study. *Journal of Clinical Child & Adolescent Psychology, 35*(2), 170-179. https://doi.org/10.1207/s15374424jccp3502_1

Sinatra, G. M., Heddy, B. C., and Lombardi, D. (2015). The challenges of defining and measuring student engagement in science. *Educational Psychologist, 50*(1), 1–13. https://doi.org/10.1080/00461520.2014.1002924

Singh, M., James, P. S., Paul, H., and Bolar, K. (2022). Impact of cognitive-behavioral motivation on student engagement. *Heliyon, 8*(7), e09843. https://doi.org/10.1016/j.heliyon.2022.e09843

Snijders, I., Wijnia, L., Rikers, R., and Loyens, S. M. M. (2020). Building bridges in higher education: student-faculty relationship quality, student engagement, and student loyalty. *International Journal of Educational Research, 100* (101538), 1-14. https://doi.org/10.1016/j.ijer.2020.101538

Tabachnick, B. G., and Fidell, L. S. (2014). *Using multivariate statistics.* Harlow: Pearson Education Limited.

Tessema, M. T., Ready, K., and Yu, W. (2012). Factors affecting college students' satisfaction with major curriculum: Evidence from nine years of data*. International Journal of Humanities and Social Science, 2*(2), 34–44.

Teuber, Z., Nussbeck, F. W., and Wild, E. (2021). The bright side of grit in burnout-prevention: exploring grit in the context of demands-resources model among Chinese high school students. *Child Psychiatry & Human Development, 52*, 464-476. https://doi.org/10.1007/s10578-020-01031-3

Usher, E. L., Li, C. R., Butz, A. R., and Rojas, J. P. (2019). Perseverant grit and self-efficacy: Are both essential for children's academic success? *Journal of Educational Psychology, 111*(5), 877–902. https://doi.org/10.1037/edu0000324

Van Ryzin, M. J. (2011). Protective factors at school: Reciprocal effects among adolescents' perceptions of the school environment, engagement in learning, and hope. *Journal of Youth and Adolescence, 40*(12), 1568–1580. https://doi.org/10.1007/s10964-011-9637-7

Wang, M. T., and Hofkens, T. L. (2020). Beyond classroom academics: A school-wide and multi-contextual perspective on student engagement in school. *Adolescent Research Review, 5*(4), 419–433. https://doi.org/10.1007/s40894-019-00115-z

Woolley, M. E., and Bowen, G. L. (2007). In the context of risk: Supportive adults and the school engagement of middle school students. *Family Relations: An Interdisciplinary Journal of Applied Family Studies, 56*(1), 92–104. https://doi.org/10.1111/j.1741-3729.2007.00442.x

Citation: Eroğlu, Y., and Kaya, M. D. (2023). Grit and academic life satisfaction: Assessment of the mediating role of school engagement. African Educational Research Journal, 11(3): 441-451.