

Research Article

Growth Mindset in Higher Education: Exploring Academic Buoyancy's Mediating Effect on Students' Academic Engagement and Psychological Well-being

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Abstract.

This research investigates the effects of growth mindset and academic buoyancy on academic engagement and psychological well-being. The study involved 314 psychology students (220 females and 94 males) from a private university in Malang, Indonesia, who were selected through stratified random sampling. The research instruments utilized were the growth mindset inventory, academic buoyancy scales, Utrecht work engagement scale, and flourishing scale. Data were analyzed using structural equation modeling (SEM). The results reveal that a growth mindset significantly impacts academic engagement, psychological well-being, and academic buoyancy. Furthermore, academic buoyancy has a considerable influence on both academic engagement and psychological well-being. Importantly, academic buoyancy was identified as a significant mediator of the effects of growth mindset on academic engagement and psychological well-being. These findings have notable implications for the fields of psychology and education. However, future studies employing longitudinal or experimental approaches and incorporating diverse data sources are needed to further elucidate these relationships.

Keywords: academic buoyancy, engagement, growth mindset, psychological well-being

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Published 7 February 2024

Publishing services provided by
Knowledge E

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Selection and Peer-review under the responsibility of the ICAP-H Conference Committee.

1. BACKGROUND

College students often face significant challenges and pressures that affect their academic engagement and psychological well-being [1]. Academic engagement refers to a positive and satisfying mental state characterized by vigor, dedication, and absorption in academic pursuits [2]. Vigor, characterized by high levels of energy and mental resilience while studying, the willingness to invest effort in one's work, and persistence even in the face of difficulties. Dedication, characterized by feelings of a sense of significance, enthusiasm, inspiration, pride, and challenge. Absorption, characterized by being fully concentrated and deeply engrossed in one's work, whereby time passes

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quickly and one has difficulties with detaching oneself in academic context. Meanwhile, psychological well-being extends beyond happiness to encompass an individual's overall sense of feeling and functioning well, including life satisfaction, self-esteem, positive relationships, and a sense of purpose [3]. Both academic engagement and psychological well-being play a crucial role in the success of students' studies and their future [4, 5, 6]. Therefore, examining factors that can influence these two aspects is highly important.

One such factor receiving recent attention is the concept of growth mindset. It posits that one's abilities can be developed through effort, practice, and support [7]. Students with a growth mindset believe their skills can grow with effort, while those with a fixed mindset perceive abilities as static [8]. Students with a growth mindset tend to be intrinsically motivated to learn, driven by curiosity and a desire for understanding, not just grades [9]. They view mistakes as opportunities for learning and accept criticism constructively, demonstrating resilience and persistence [8]. Consequently, students with a growth mindset are more engaged in academic activities, as shown in previous studies [10, 11, 12].

Moreover, a growth mindset not only influences academic engagement but also affects psychological well-being [13]. Students with a growth mindset are able to navigate the complexities of their academic journey by framing challenges and failures as constructive feedback, which is crucial in directing their efforts and strategies in the future. They also have a proactive approach towards setbacks, viewing them as a fundamental component of the learning process. This inherently reduces stress and anxiety by reframing its psychological and emotional implications. Therefore, students with a growth mindset not only demonstrate remarkable adaptability in facing various challenges and diverse obstacles that arise in academic activities but also are psychologically healthier. This is in line with previous research showing that a growth mindset not only impacts in dampening the potential impacts of excessive stress and anxiety but also contributes positively to psychological well-being [12,14].

A growth mindset is not the sole determinant; academic buoyancy also plays a pivotal role in enhancing academic engagement and psychological well-being among college students. Academic buoyancy refers to the ability of students to navigate through various academic pressures, manage stress, handle errors, and sustain motivation in their daily academic life [15,16]. Several studies have demonstrated that academic buoyancy promotes academic engagement by fortifying resilience against academic challenges [15, 17,18]. Students with high academic buoyancy tend to remain focused on learning, even when they encounter difficulties. This, in turn, exerts a positive impact on

psychological well-being, aiding students in adapting to changes, maintaining emotional balance, enhancing self-esteem, and amplifying overall life satisfaction [19, 20].

Furthermore, the growth mindset and academic buoyancy are interconnected. The growth mindset bolsters academic buoyancy by allowing students to view challenges as opportunities for learning. In alignment with the findings that reported both a growth mindset and resilience play a pivotal role in amplifying academic buoyancy among university students [21]. Meanwhile, academic buoyancy, in its turn, acts as a mediator in various research models [19, 22, 18, 23]. For instance, academic buoyancy has been found to mediate between; academic hope and academic engagement among students [19] and between asset development and well-being among students in Iran [22], and between personal, family, peer, educational factors on academic engagement among university students [18].

Referring to previous research as outlined above, it is evident that a growth mindset and academic buoyancy influence academic engagement and psychological well-being. However, specific research on the mediation role of academic buoyancy among college students remains limited. Up until the present time, there hasn't been a comprehensive study exploring the interaction of growth mindset, academic buoyancy, academic engagement, and psychological well-being. This knowledge gap needs to be addressed, as understanding the role of academic buoyancy could provide insights for enhancing academic engagement and psychological well-being among college students. This research aims to address this gap by examining how a growth mindset influences academic engagement and psychological well-being through the mediating role of academic buoyancy in the context of college students.

Based on the background provided, the hypotheses for this study are as follows:

1. Growth mindset has a significant effect on academic engagement.
2. Growth mindset has a significant effect on academic buoyancy.
3. Growth mindset has a significant effect on psychological well-being.
4. Academic buoyancy has a significant effect on academic engagement.
5. Academic buoyancy has a significant effect on psychological well-being.
6. Academic buoyancy significantly mediates the effect of a growth mindset on academic engagement.
7. Academic buoyancy significantly mediates the effect of a growth mindset on psychological well-being.

2. RESEARCH METHODS

2.1. Variables or concepts studied

This study consists of four variables: (1) growth mindset as the independent variable; (2) academic buoyancy as the mediator variable; (3) academic engagement as the dependent variable; and (4) psychological well-being as the dependent variable. First, the growth mindset defined as a student's belief that abilities can be developed through effort, training and support, will be measured with the Growth Mindset Inventory [24]. Second, academic buoyancy, the ability of students to overcome daily academic challenges and stress (e.g., poor performance, competing deadlines, performance pressure, and challenging tasks), will be measured using the Academic Buoyancy Scale [25]. Third, academic engagement, a positive and satisfying state of mind in students characterized by vigor, dedication, and absorption in academic activities, will be measured using an Ultra Short of Utrecht Work Engagement Scale (UWES-3) [26]. Lastly, psychological well-being, a state in which students feel happy, satisfied with their lives, have self-esteem, have good interpersonal relationships, and feel they have a purpose in life, will be measured using the Flourishing Scale [3]

2.2. Sampling Method

The sample comprises 314 psychology students from a private university in Malang, Indonesia. Participants were recruited through stratified random sampling. The population was divided into strata based on the first, second, third, and fourth years of study. The goal is to ensure that each stratum is proportionally represented in the sample.

2.3. Research Subject

The subjects of this study are 314 students (220 females and 94 males) actively enrolled in a private university in Malang, Indonesia. Subjects are aged 18-25 years with an average age of 19.7 years, who were voluntarily recruited as respondents without any form of compensation.

2.4. Research Instruments

The instruments for growth mindset, academic buoyancy, academic engagement, and psychological well-being were adapted from English to Indonesian. Instruments were

translated into Indonesian by two translators, synthesized, and subsequently back-translated by another pair of translators, ensuring that the meaning of the Indonesian version aligns with the English version. Expert reviews were conducted, followed by pilot testing for validity and reliability. This process adheres to the instrument adaptation steps from Beaton et al. [27].

Growth mindset was measured using The Growth Mindset Inventory [24]. The scale consists of three items, for instance, “You have a certain amount of intelligence, and you can’t really do much to change it”. Responses were provided on a 6-point Likert scale (1 = strongly agree to 6 = strongly disagree). The Indonesian version of the growth mindset scale demonstrated high validity and reliability with factor loadings ranging between (0.79 to 0.97) and a Cronbach’s alpha of $\alpha = 0.95$.

Academic buoyancy was gauged using the Academic Buoyancy Scale [25]. The Indonesian version of the Academic Buoyancy Scale is consistent with four items on a 5-point Likert scale (5 = strongly agree to 1 = strongly disagree). An example item is “I am good at dealing with setbacks in academia, such as negative feedback on my work, poor results”. The Indonesian version exhibited adequate validity and reliability with factor loadings from (0.62 to 0.87) and a Cronbach’s alpha of $\alpha = 0.87$.

Meanwhile, academic engagement was assessed using The Ultra-Short Utrecht Work Engagement Scale (UWES-3) [26]. 2019). The Indonesian version retains three items measuring aspects of vigor, dedication, and absorption on a 7-point Likert scale (0 = never to 6 = every day). The scale’s Indonesian version has high validity and reliability, with factor loadings of (0.93-0.95) and a Cronbach’s alpha of $\alpha = 0.90$.

Lastly, psychological well-being was evaluated using the Flourishing Scale from Diener et al. [3]. The Indonesian version of this scale consists of eight items utilizing a 6-point Likert scale ranging from ‘1’ strongly disagree to ‘7’ strongly agree. An illustrative item is “I lead a very purposeful life”. The Indonesian Flourishing Scale exhibits adequate validity and reliability with factor loadings between (0.51 to 0.88) and a Cronbach’s alpha of $\alpha = 0.84$.

2.5. Research Design

This study is a quantitative cross-sectional design to test the structural equation model of the four variables: growth mindset, academic buoyancy, academic engagement, and psychological well-being in students. This design was chosen because the study measures or observes the independent and dependent variables at a single time point [28].

2.6. Data Collection Procedures

Data were collected during class hours through an online survey link sent to students willing to participate. Before the questionnaire was administered, participants were informed about the purpose of the study, ensuring that all data would remain confidential, accessible only to the research group, and used solely for research purposes.

2.7. Data analysis technique

Data analysis included two procedures. First, descriptive statistics using SPSS. Second, Structural Equation Modeling (SEM) with latent variables was adopted for mediation analysis using AMOS. This structural equation model test included measurement model and structural model tests. Prior to model testing, assumption testing was performed for outliers, normality, and multicollinearity. Model fit was evaluated using goodness-of-fit indices, including Chi-square (χ^2) (≥ 0.05), CMIN/DF (≤ 2.00), RMSEA (≤ 0.08), GFI, AGFI, NNFI/TLI, and CFI ≥ 0.90 [29]. This analytical technique is suitable for testing the unobservable multivariate relationships of the four variables in this study.

3. RESULT

3.1. Descriptive Statistical Analysis

TABLE 1: Descriptive Analysis Results.

Variabel	N	Minimum	Maximum	Mean	Std Deviation
Growth Mindset	314	3	18	12,64	3,77
Academic Buoyancy	314	4	15	9,96	2,58
Academic Engagement	314	4	28	14,07	3,72
Psychological Well-being	314	19	54	36,07	8,64

Table 1 above shows that, among 314 students surveyed, the growth mindset had a minimum value of 4 and a maximum of 18, with an average score of 12.64 and a standard deviation of 3.77. Academic buoyancy had a minimum value of 4 and a maximum of 15, with an average score of 9.96 and a standard deviation of 2.58. In terms of academic engagement, the values ranged from a minimum of 4 to a maximum of 28, with an average score of 14.07 and a standard deviation of 3.72. Meanwhile, for psychological well-being, the values ranged from a minimum of 19 to a maximum of 54, with an average

score of 36.07 and a standard deviation of 8.64. In general, these results indicate that the students surveyed in this study exhibit moderate levels of growth mindset, academic engagement, and psychological well-being. Additionally, it also unveils a lower level of academic buoyancy.

3.2. Results of The Measurement Model Test.

The results gleaned from a confirmatory factor analysis on the measurement model indicate that all four constructs under investigation demonstrate an appropriate model fit. Evaluated on the “goodness of fit” metrics, the observed values were CMIN/DF (≤ 2.00), RMSEA (≤ 0.08), GFI, AGFI, NNFI/TLI, and CFI (≥ 0.90). Each item across these constructs exhibited a factor loading value surpassing 0.04, accompanied by a Composite Reliability (CR) in excess of 0.07 and an Average Variance Extracted (AVE) over 0.50.

Beyond satisfying the criteria for the measurement model, the dataset of this study also complied with specific statistical assumptions. These include: a test confirming the absence of outliers (as evidenced by the comparison of p1 and p2 values in the Mahalanobis distance for all 314 observations, all of which were above 0.001), a test ensuring data normality (with a CR1 value positioned at 1.450 or c.r less than 2.58), and an examination confirming the absence of multicollinearity, as delineated by a Variance Inflation Factor (VIF) consistently below the threshold of 10.

3.3. Results of Structural Equation Modeling Analysis

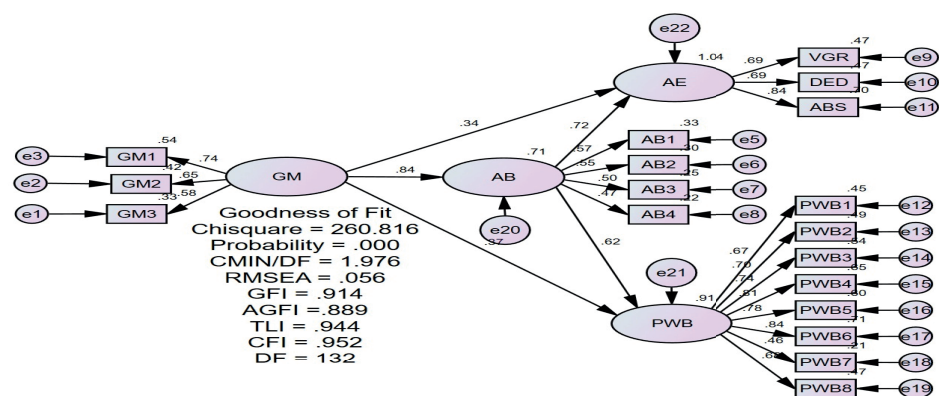


Figure 1: Result of of the Structural Equation Modeling Analysis.

TABLE 2: Fitness Index of The Theoretical Model.

Research Model	df	Chi-square	Probability	Cmin/df	RMSEA	GFI	AGFI	TLI	CFI
	132	260.87	0.00	1.97	0.056	0.91	0.89	0.94	0.95

The results of the theoretical model fit assessment in this study, presented in Table 2, indicate that the tested model has a degree of freedom (df) of 132 and a Chi-square value of 260.87 with a probability of 0.00, signifying the model’s statistical significance. The goodness-of-fit indices examined include Cmin/df (1.97), which is less than or equal to the acceptable threshold of 2.00, and RMSEA (0.056), which is less than or equal to the desired maximum of 0.08. The GFI, AGFI, TLI, and CFI all have high values above 0.9 (with the exception of AGFI, which is slightly below at 0.89), suggesting good model fit to the observed data. Overall, the analysis indicates that the theoretical model in this study fits the observed data well.

TABLE 3: Path Coefficient of The Model.

Path	S.E.	β	t	P
GM → AE	0.048	0.338	7.041	0.006
GM → AB	0.064	0.841	13.14	0.007
GM → PWB	0.064	0.371	5.796	0.019
AB → AE	0.036	0.722	20.055	0.016
AB → PWB	0.056	0.619	11.053	0.003

Table 3, indicates a direct and significant relationship between Growth Mindset (GM) and Academic Engagement (AE), with a path coefficient value of 0.338, t-value of 7.041, and p-value of 0.006 ($p < 0.05$). Furthermore, Growth Mindset (GM) was identified to have a significant relationship with Academic Buoyancy (AB), with a path coefficient of 0.841, a t-value of 13.14, and a p-value of 0.007 ($p < 0.05$). In addition, Growth Mindset (GM) also exhibited a significant association with Psychological Well-being (PWB), supported by a path coefficient of 0.371, t-value of 5.796, and p-value of 0.019 ($p < 0.05$). Moreover, Academic Buoyancy (AB) was identified to have a significant relationship with both Academic Engagement (AE) and Psychological Well-being (PWB), evidenced by path coefficients of 0.722 and 0.619, t-values of 20.055 and 11.053, and p-values of 0.016 and 0.003 ($p < 0.05$), respectively.

TABLE 4: Mediation Effect Test of Structural Model.

Path	Estimates	Product of Coefficients		Bootstrap 1000 times 95% CI Bias-corrected		
		S.E.	Z-value	Lower	Upper	P
GM → AB → AE	0.607	0.062	9.79	0.480	0.740	0.006
GM → AB → PWB	0.521	0.065	8.01	0.407	0.655	0.003

The mediation effect results presented in Table 4, indicate that for the path from Growth Mindset (GM) through Academic Buoyancy (AB) to Academic Engagement (AE), a coefficient of 0.607 is achieved, with a standard error (S.E.) of 0.062, and a Z-value of 9.79 with a p-value of 0.006, this relationship is considered statistically significant ($p < 0.05$). For the second mediation path from Growth Mindset (GM) through Academic Buoyancy (AB) to Psychological Well-being (PWB), a coefficient of 0.521 is obtained, with an S.E. of 0.065, and a Z-value of 8.01, accompanied by a p-value of 0.003, which also signifies statistical significance ($p < 0.05$). These findings demonstrate that Academic Buoyancy significantly mediates the effect of Growth Mindset on both Academic Engagement and Psychological Well-being among students.

4. DISCUSSION

The results of the descriptive statistical analysis indicate that the majority of students in higher education who participated in this study exhibit a growth mindset, academic engagement, and psychological well-being in the medium category, as well as academic buoyancy in the low category. These findings suggest that efforts are still needed to enhance and explore the factors contributing to the improvement of all four variables, especially student academic buoyancy, which is in a lower category compared to the other three variables. Furthermore, the results of the full structural model test reveal that the theoretical model hypothesized in this study is empirically validated. In other words, there is an influence among growth mindset, academic buoyancy, academic engagement, and psychological well-being, both directly and through mediators.

An elaborate discussion pertaining to the research findings is as follows: First, the growth mindset exerts a significant influence on academic engagement. This result corroborates the findings of preceding researchers who have reported that an evolving mindset does indeed influence academic engagement [10,11,12]. Students who harbor the belief that their abilities or intelligence can be developed or altered through concerted effort and practice are more predisposed to surmount challenges, pressures, and adversities in their academic pursuits. Moreover, they tend to persist and explore solutions, rather than capitulating, when confronted with difficulties or obstacles or obstacles [8]. This predisposition enables them to engage more intensively in academic activities compared to those who perceive their abilities or intelligence as static and immutable. In essence, tertiary education students who believe that their abilities can be cultivated tend to exhibit higher vitality, enthusiasm, and pride towards their studies. Furthermore, they are also able to undergo their studies with consummate concentration

and a sense of joy, thereby perceiving time as seemingly fleeting rapidly and even finding it challenging to extricate themselves from academic activities.

Second, a growth mindset significantly influences academic buoyancy. In the academic context, a growth mindset plays a critical role in shaping students' attitudes towards learning and their ability to cope with academic challenges. When students possess a growth mindset, they are more likely to perceive difficulties as temporary setbacks that can be overcome through concerted effort and appropriate strategies. Such a mindset cultivates resilience, perseverance, and motivation, leading to increased academic buoyancy. This aligns with findings from previous research that reported students with a growth mindset tend to view difficulties as learning opportunities and exhibit higher academic buoyancy [21].

Third, the findings indicate that a growth mindset significantly influences psychological well-being. This means that students who believe that abilities can be altered and developed tend to feel happier and function better in areas such as life satisfaction, self-esteem, and having a purpose in life [30]. These findings are consistent with previous research which showed that students with a growth mindset score higher on all aspects of psychological well-being compared to those with a fixed mindset, who score lower on almost all aspects of psychological well-being [13,14]. Furthermore, these findings also reinforce results from other researchers that indicate that students with higher growth mindset scores exhibit higher levels of well-being than those with a fixed mindset [13].

Fourth, finding shows that academic buoyancy significantly affects academic engagement. This means that students who are confident in their ability to face challenges, pressures, or difficulties tend to stay focused and engaged in the learning process, even when under pressure. Academic buoyancy also helps students maintain or recover positive feelings about learning, motivating them to continue studying even when encountering difficulties [31]. This enables students to process information more deeply and actively engage in academic activities. This finding is consistent with previous research reporting that academic buoyancy affects academic engagement [22, 23,17, 18].

Fifth, our results indicate a significant positive relationship between academic buoyancy and psychological well-being, consistent with prior empirical findings [19,20]. Specifically, students exhibiting high academic buoyancy were found to be associated with elevated levels of enjoyment and hope, and reduced levels of despair [20]. Moreover, students characterized by high academic buoyancy demonstrated greater adaptability to change, uncertainty, and novelty, factors that are conducive to increased

experiences of happiness [14]. This underscores the potential importance of academic buoyancy as a contributing factor to students' psychological well-being.

Sixth, finding shows that academic buoyancy significantly mediates the effect of a growth mindset on academic engagement. This means that students with a growth mindset tend to have strong academic buoyancy, as they view difficulties as temporary and overcome them with effort and appropriate strategies. Furthermore, students with high academic buoyancy can approach academic challenges with a more positive and adaptive attitude. Additionally, students possessing elevated levels of academic buoyancy are inclined to adopt a more positive and adaptive approach towards academic challenges. Consequently, they are more prone to maintain engagement in academic endeavors and persist, even in the face of difficulties or obstacles. These results corroborate prior studies that have indicated that academic buoyancy significantly mediates the association between academic aspirations and academic engagement [22] and serves as a significant mediator between academic stress and school engagement [23]. This finding corroborates prior research which suggests that academic buoyancy acts as a mediating factor in the influence of educational variables on academic engagement [18]. Consequently, it can be posited that students possessing a growth mindset are predisposed to exhibit elevated levels of academic buoyancy, which in turn, contributes to enhanced academic engagement. In this context, academic buoyancy functions as a mediating mechanism, facilitating adaptive responses to challenges and fostering sustained participation in academic endeavors.

Seventh, the results of this study reveal that academic buoyancy significantly mediates the effect of a growth mindset on psychological well-being. This aligns with prior research findings that demonstrate academic buoyancy serving as a mediator in the relationship between asset development and academic well-being [19]. Students who possess a growth mindset are more inclined to approach academic challenges with a positive demeanor and perceive failure as an opportunity for learning [8]. This propensity is likely to bolster academic buoyancy, as students with a growth mindset are typically resilient in the face of minor academic setbacks, persevering despite encountering difficulties. Furthermore, students endowed with academic buoyancy tend to experience heightened levels of satisfaction and confidence in their capabilities to surmount challenges. This phenomenon contributes to an enhancement of their psychological well-being, characterized by increased competence, contentment with their academic experiences, a sense of purpose and empowerment, and optimism regarding their future prospects. Hence, it can be deduced that a growth mindset augments psychological well-being through the intermediary role of academic buoyancy. Students embracing

a growth mindset are more apt to exhibit elevated academic buoyancy, which subsequently fosters an increase in their psychological well-being.

Based on the discussion related to the results of this research, it is evident that the theoretical model of academic buoyancy as a mediator of the influence of growth mindset on academic engagement and psychological well-being is empirically confirmed. Consequently, the findings of this research have both theoretical and practical implications. Theoretically, the results of this study reinforce and expand the educational psychology literature concerning the roles of growth mindset and academic buoyancy in enhancing students' academic engagement and psychological well-being. These findings support previously reported concepts about the benefits of possessing a growth mindset and the importance of academic buoyancy in the educational context. By gaining a deeper understanding of how these two constructs interact and impact students' academic success and psychological well-being, researchers can further explore other factors that may influence these constructs and develop more comprehensive theoretical models.

Practically, the results of this study provide valuable insights for educators, counselors, and other educational practitioners. By understanding the benefits of a growth mindset and the significance of academic buoyancy, educational institutions at both faculty and university levels can develop programs and interventions designed to promote growth mindset and academic buoyancy among students. Furthermore, instructors can be encouraged to provide feedback that supports a growth mindset and urge students to view difficulties and failures as opportunities for learning and growth. Thus, through an approach that focuses on cultivating mindset and academic buoyancy, education can be more effective in preparing students to face challenges and achieve success in the future.

This study has several methodological limitations that need to be considered. First, this research is based on cross-sectional data, which does not allow for conclusions about causality. Alternate causal directions and relationships are possible. Future studies may need to use a prospective design to confirm the findings longitudinally. Second, this study relies on a relatively small sample, examining only students at one university in the city of Malang, and does not represent all Indonesian students. Therefore, the findings should be generalized cautiously. Third, the current data is based solely on self-report data, which could pose potential threats to validity and reliability. Future research should consider reports from multiple informants (e.g., professors, parents, and peers).

5. CONCLUSION

The results of this study indicate that a growth mindset exerts a significant impact on academic engagement, academic buoyancy, and psychological well-being among students in higher education institutions. Academic buoyancy itself also significantly influences academic engagement and psychological well-being. Additionally, it has been revealed that academic buoyancy plays a significant mediating role in the effect of a growth mindset on academic engagement and psychological well-being. As such, the influence of a growth mindset on academic engagement and psychological well-being is mediated by academic buoyancy. This signifies that university students with a growth mindset exhibit an increased level of academic buoyancy, which subsequently contributes to the enhancement of their academic engagement and psychological well-being. Therefore, future researchers need to develop various interventions to augment academic buoyancy and the growth mindset among students in higher education institutions as an endeavor to enhance their academic engagement and psychological well-being.

Acknowledgments

The authors feel gratitude and appreciation for all the people who participated in the study.

Funding

The author(s) received financial support from a block grant of psychology faculty, University of Muhammadiyah Malang for the research, authorship, and/or publication of this article.

Ethics Policy

The authors have no conflicts of interest.

We used online questionnaires to investigate the psychological constructs of students, which means that we informed each student about this research and invited them to participate. If they did not wish to participate, they could decline to answer the questionnaire. Most of them agreed. No vulnerable populations were involved.

References

- [1] Tinto V. Through the eyes of students. *Journal of College Student Retention: Research, Theory & Practice*. 2017;19(3):254–269.
- [2] Schaufeli WB, Martínez IM, Pinto AM, Salanova M, Bakker AB. Burnout and engagement in university students a cross-national study. *Journal of Cross-Cultural Psychology*. 2002;33(5):464–481.
- [3] Diener E, Wirtz D, Tov W, Kim-Prieto C, Choi D won, Oishi S, et al. New well-being measures: Short scales to assess flourishing and positive and negative feelings. *Social Indicators Research*. 2010;97(2):143–156.
- [4] Datu JAD. Flourishing is associated with higher academic achievement and engagement in Filipino undergraduate and high school students. *Journal of Happiness Studies*. 2018;19(1):27–39.
- [5] Ketonen EE, Malmberg LE, Salmela-Aro K, Muukkonen H, Tuominen H, Lonka K. The role of study engagement in university students' daily experiences: A multilevel test of moderation. *Learning and Individual Differences [Internet]*. 2019;69(October):196–205.
- [6] Montano RLT. Academic engagement predicts flourishing among students in online learning setup: The mediating role of psychological needs. *Journal of Psychological and Educational Research*. 2021;29(1):177–194.
- [7] Limeri LB, Carter NT, Choe J, Harper HG, Martin HR, Benton A, et al. Growing a growth mindset: characterizing how and why undergraduate students' mindsets change. *International Journal of STEM Education*. 2020;7(1).
- [8] Yeager DS, Dweck CS. Mindsets that promote resilience: When students believe that personal characteristics can be developed. *Educational Psychology*. 2012;47(4):302–314.
- [9] Dunn TJ, Kennedy M. Technology Enhanced Learning in higher education; Motivations, engagement and academic achievement. *Computers & Education [Internet]*. 2019;137(April):104–113.
- [10] Kim MS, Park S. Growth of fixed mindset from elementary to middle school: Its relationship with trajectories of academic behavior engagement and academic achievement. *Psychology in the Schools*. 2021;58(11):2175–2188.
- [11] Lee WSW, Man KYS. Associate degree students' growth mindset, sense of well-being and academic engagement: An exploratory study. Paper presented at FSTE Conference: Emotional and Mental Wellbeing for Whole Person Development, Hong Kong, China. In Hongkong: The Education University of Hongkong; 2020.

- [12] Zeng G, Hou H, Peng K. Effect of growth mindset on school engagement and psychological well-being of Chinese primary and middle school students: The mediating role of resilience. *Frontiers in Psychology*. 2016;7(Nov).
- [13] Ortiz Alvarado NB, Rodríguez Ontiveros M, Ayala Gaytán EA. Do mindsets shape students' well-being and performance? *Journal of Psychology*. 2019;153(8):843–859.
- [14] Whittington RE, Rhind S, Loads D, Handel I. Exploring the link between mindset and psychological well-being among veterinary students. *Journal of Veterinary Medical Education*. 2017;44(1):134–140.
- [15] Collie RJ, Ginns P, Martin AJ, Papworth B. Academic buoyancy mediates academic anxiety's effects on learning strategies: An investigation of English- and Chinese-speaking Australian students. *Educational Psychology*. 2017;37(8):947–964.
- [16] Martin AJ, Yu K, Ginns P, Papworth B. Young people's academic buoyancy and adaptability: A cross-cultural comparison of China with North America and the United Kingdom. *Educational Psychology*. 2017;37(8):930–946.
- [17] Datu JAD, Yuen M. Predictors and consequences of academic buoyancy: A review of literature with implications for educational psychological research and practice. *Contemporary School Psychology*. 2018;22(3):207–212.
- [18] Javadi-Elmi L, Yarshir S, Laal-Avazpour N. Designing and validating a structural model for academic engagement based on personal, family, peer, and educational factors with the mediating role of academic buoyancy in university students. *International Journal of Body, Mind and Culture*. 2022;9(4):44–50.
- [19] Bojnordi MA, Bakhtiarpour SA. Internal and external developmental assets and well-being: The Mediating Role of Academic Buoyancy. 2020;(August 2019).
- [20] Hirvonen R, Putwain DW, Määttä S, Ahonen T, Kiuru N. The role of academic buoyancy and emotions in students' learning-related expectations and behaviours in primary school. *British Journal of Educational Psychology*. 2020;90(4):948–963.
- [21] Pratiwi M, Dwi Iswari R, Delaritas Nesvita M, Sabila Khairiyah U. Growth mindset and grit: Examining the academic buoyancy of college students implementing online lectures. 2023;12(1):70–80.
- [22] Adianbojnordi, Bakhtiarpour S, Makvandi B, Ehteshamizadeh P. Can academic hope increase academic engagement in Iranian students who are university applicants? Investigating academic buoyancy as a mediator. *Journal of Psychologists and Counsellors in Schools*. 2020;(May):1–9.
- [23] af Ursin P, Järvinen T, Pihlaja P. The role of academic buoyancy and social support in mediating associations between academic stress and school engagement in

- Finnish primary school children. *Scandinavian Journal of Educational Research*. 2021;65(4):661–675.
- [24] Dweck CS. *Mindset: The new psychology of success*. New York, NY: Random Housette; 2006.
- [25] Martin AJ, Marsh HW. Academic resilience and academic buoyancy: Multidimensional and hierarchical conceptual framing of causes, correlates and cognate constructs. *Oxford Review of Education*. 2009;35(3):353–370.
- [26] Schaufeli WB, Shimazu A, Hakanen J, Salanova M, De Witte H. An ultra-short measure for work engagement: The UWES-3 validation across five countries. *European Journal of Psychological Assessment*. 2019;35(4):577–591.
- [27] Beaton DE, Bombardier C, Guillemin F, Ferraz MB. Guidelines for the process of cross-cultural adaptation of self-report measures. *Spine*. 2000;25(24):3186–3191.
- [28] Babbie E. *The practice of social research*. 14th ed. Mason, OH: CENGAGE Learning Custom Publishing; 2014.
- [29] Hair Jr J, Sarstedt M, Hopkins L, Kuppelwieser V. Partial least squares structural equation modeling (PLS-SEM). *European Business Review*. 2014;26(2):106–121.
- [30] Burnette JL, Knouse LE, Vavra DT, O'Boyle E, Brooks MA. Growth mindsets and psychological distress: A meta-analysis. *Clinical Psychology Review*. 2020;77(January 2019):101816.
- [31] Collie RJ, Martin AJ, Malmberg LE, Hall J, Ginns P. Academic buoyancy, student's achievement, and the linking role of control: A cross-lagged analysis of high school students. *British Journal of Educational Psychology*. 2015;85(1):113–130.
- [32] Datu JAD, Yang W. Psychometric validity and gender invariance of the academic buoyancy scale in the Philippines: A construct validation approach. *Journal of Psychoeducational Assessment*. 2018;36(3):278–283.