



Moderated mediating effect of growth mindset in the impact of grit on employment preparation behavior through major commitment: focused on airline service major students

A. JEON

ABSTRACT

Introduction. Grit affects the major commitment of students majoring in airline service. In addition, major commitment has a positive effect on the employment preparation behavior of students majoring in airline service. Growth mindset plays an important role that enforces the mediation of major commitment mediates between grit and employment preparation behavior. *This study highlights* the moderated mediation effect of growth mindset, demonstrating the full mediation effect among grit, major commitment, and employment preparation behavior.

Methods. The participants in this study consisted of 284 students majoring in airline service from three universities. The sample included freshmen (19.7%), sophomores (39.1%), juniors (29.6%), and seniors (11.6%). Data were analyzed using SPSS Win version 21.0 to perform frequency analyses, reliability testing, and correlation analysis. For the moderated mediation analysis, Model 7 of the PROCESS macro version 4.3 was employed as the primary statistical method.

Results. First, grit had a significant positive effect on major commitment ($\beta = .2917$, $p < .001$), and major commitment had a significant positive effect on employment preparation behavior ($\beta = .4291$, $p < .001$). However, the effect of grit on employment preparation behavior did not significant ($\beta = .1274$, $p > .05$). The interaction term between grit and growth mindset had a significant effect on employment preparation behavior ($\beta = -.1215$, $p < .05$). Second, growth mindset was found to have conditional indirect effects on the relationship between grit and employment preparation behavior through major commitment that were significant ($p < .001$) when the growth mindset values were low (M-1SD), mean (M), or high (M+1SD), respectively. Therefore, the moderated mediation effect of growth mindset was verified.

Conclusions. This study verified the positive effect of grit on employment preparation behavior through the full mediation of major commitment. The results of this study indicate that students' growth mindset should be fostered and reinforced with the goal of increasing airline service major students' grit and major commitment, resulting in improving their employment preparation behavior.

KEYWORDS

growth mindset, grit, major commitment, employment preparation behavior, airline service major students

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INTRODUCTION

UNESCO-International Bureau of Education emphasized the importance of competences as a framework in which educational organizations would work and set learning objectives. One of the seven competences written in the educational white paper is self-agency (entrepreneurship, responsibility, self-worth, creativity, grit) of which component, grit has recently received attention in higher education research [1]. Students prepare for employment as soon as they enroll, and further prepare for employment after graduation. In this situation, the period of preparation for employment is increasing. Considering this employment environment, undergraduates need continued interest in their future employment and consistent action, and psychological factors to overcome adversity (e.g. employment stress) are recognized as very important [2]. In particular, students majoring in airline services can be said to be a reference group with distinct employment goals before choosing a major compared to students majoring in other majors. However, since the competition rate for employment as an airline flight attendant is considerably higher than that of other occupations, not short-term passion and persistence, but long-term passion and persistence, are needed and more important than anything else [3].

Grit defined as passion and persistence toward long-term goals, is one of the personal characteristics shown by people who have achieved outstanding achievements in various fields. Students with high grit have the characteristic of maintaining interest and making consistent efforts to achieve their goals even when difficulties or adversities arise in the process of achieving long-term goals. Students who have to prepare for employment while attending school at the same time experience stress about employment, and in this situation, it was reported that the higher the grit of undergraduates, the higher their career decision self-efficacy and employment preparation behavior [4].

Based on the above studies and their applicability to practical matters, it is necessary to continue exploring the link between grit and employment preparation behavior. Thus, in this study, major commitment was applied as a mediating variable whereas growth mindset was used as the moderating variable to elucidate the elaborate mechanism between grit and employment preparation behavior. Students with high grit have clear goals even in difficult situations and make an effort to achieve them, so they focus and immerse themselves in learning and major [5].

Major commitment is the degree to which feels attached and is immersed in a major filed; it is a psychological attachment toward major while attending school [6]. However, few studies have verified the mediating effect of major commitment between grit and employment preparation behavior. Kim et al. [5] found that major commitment were increased by grit, which increased employment preparation behavior [7]. In other words, major commitment can serve as a mediator between grit and employment preparation behavior. It can therefore be inferred that major commitment is a positive variable that links the two variables in this study.

Students inevitably face success and failure in the process of setting a career path and preparing to enter society. The reason why each student's employment preparation behavior differs despite similar successes and failures is related to mindset [8]. Growth mindset is the power that allows one to overcome difficult situations through one's own efforts and pursue a superior self [9]. Growth mindset could be a more fundamental belief in airline service major students, and that it moderates the degree or direction of the causal relationship between the academic major-related variable and the employment preparational behavior variable. Thus, students with high growth mindset would reenforce the effect of more employment preparation behavior that results from their high major commitment [10].

The purpose of the current study is to identify the moderated mediation effect of growth mindset in the impact of grit on employment preparation behavior through major commitment. Given the results of the studies referenced above, this study is expected to provide a model wherein growth mindset can be used to improve the relationship between airline service major students' grit and major commitment.

THEORETICAL BACKGROUND

1. Relationship between grit and employment preparation behavior

Grit is not a concept that simply refers to working hard, but is a concept that means setting a long-term goal and making continuous efforts without giving in to obstacles, frustrations, and failures that may be encountered in the process of achieving that goal [11]. The common core competencies of successful people lie in non-cognitive factors such as talent, passion, and consistent effort. Duckworth et al. [12] named the common characteristic of people who achieved success in various fields as 'grit.' According to their research, people with high levels of grit are more intelligent, and achieve relatively higher success, even if the opportunities are the same. In other words, the keys for success are not the decisive factors such as talent or IQ that have been widely emphasized, but interest and passion for achieving long-term goals.

The components of grit can be divided into two dimensions: consistency of interest and persistence of effort. Consistency of interest means sustaining long-term, intentional attention to personal goals or goals that meet social expectations. It represents the passion to maintain a goal or interest steadily over a long period of time. Persistence of effort refers to the degree to which one continues to put effort into one's work to achieve a goal. This means controlling oneself to achieve goals and responding flexibly to any situation [12]. These two dimensions serve as determining the career or employment path that is the students' final goal.

Employment preparation behavior refers to specific actions undertaken to obtain desired employment, such as exploring necessary information related to one's career goals. In the long-term process of engaging in such behaviors, students with high levels of grit are expected to demonstrate sustained effort and passion toward achieving their goals, while also persevering through various obstacles and setbacks [13]. Previous studies have indicated that grit is one of the important variables improving employment preparation behavior [14; 15]. Park [13] found that higher levels of grit are associated with higher levels of employment preparation behavior among students majoring in dental hygiene, early childhood education, and airline service. Hong & Bae [14] examined that grit has a positive impact on the employment preparation behavior using data of 340 students in 3 universities in South Korea. Cho & Cho [15] also investigated that grits have a significant effect on improving music major students' employment preparation behavior. In other words, higher Grit was associated with higher employment preparation behavior. Thus, it can be assumed that airline service student's interaction with faculty will increase their employment preparation behavior in this study.

2. The mediating effect of major commitment

Major commitment is related to the concept of flow which is "a state in which people are so involved in an activity that nothing else seems to matter; the experience is so enjoyable that people will continue to do it even at great cost, for the sheer sake of doing it" [16, p. 4]. Major commitment refers to the degree of psychological immersion students experience in their major-related coursework. In other words, it reflects the extent to which students are intellectually and emotionally engaged with their chosen field of study [17]. The study conducted by Kim et al. [5] identified a significant correlation between grit and major commitment among nursing students. This implies that students with higher levels of grit tend to maintain clear goals and a strong determination to achieve them, even in challenging situations, which consequently leads to greater concentration and immersion in their academic major.

Although there have been few studies showing that major commitment mediates grit and employment preparation behavior, previous research on the relationship between major commitment and student' employment preparation has suggested that higher levels of major commitment are associated with increased employment rates in fields related to one's major. Jeong [18] proposed two key reasons for this: first, students with strong major commitment are more likely to possess a clear sense of purpose and a strong intention to pursue careers related to their major; second, such students are more likely to begin preparing for their future at an earlier stage, which is also associated with effective academic performance management in both major and non-major courses. When airline service major students are deeply committed to their major, they are more likely to

prepare for their employment goals [19]. This leads them to actively engage in employment planning and undertake specific employment preparation behaviors.

Based on these prior results, it can be predicted in this study that grit may increase employment preparation behavior through major commitment in addition to the direct impact between grit and employment preparation behavior.

3. Moderating effect of growth mindset

Growth mindset can be defined as intelligence and abilities are not static traits but can be enhanced through persistence and effort [20]. In other words, people who adopt a growth mindset believe that their core capabilities can be nurtured and strengthened over time. This perspective promotes embracing challenges and viewing failures as valuable chances to learn and grow. Previous studies have indicated that growth mindset of university students majoring in airline and tourism has a positive effect on grit. The study [21] demonstrated that a growth mindset influences students' sustained effort and interest in improving their abilities and personal characteristics. In other words, the findings confirmed that higher levels of growth mindset are associated with increased levels of grit. In a study examining the relationship between growth mindset and major commitment, Heo & Kim [22] found that the growth mindset of students majoring in dance significantly influenced their grit, as well as their cognitive and behavioral commitment to their major.

Despite the academic attention on the role of growth mindset in the relationship between grit and major commitment among aviation service majors, there have been few studies verifying the moderating effect of growth mindset in the relationship between grit and major commitment. Thus, based on the literature review above, this study aims to verify the moderating effect of growth mindset between grit and major commitment. It also aims to identify whether growth mindset moderates the mediating effects of major commitment in the link between grit and employment preparation behavior.

RESEARCH METHODS

1. Research model

The research model, presented in Figure 1, was developed to examine the moderated mediating effect (conditional indirect effect) wherein growth mindset moderated the path of grit→ major commitment→ employment preparation behavior.

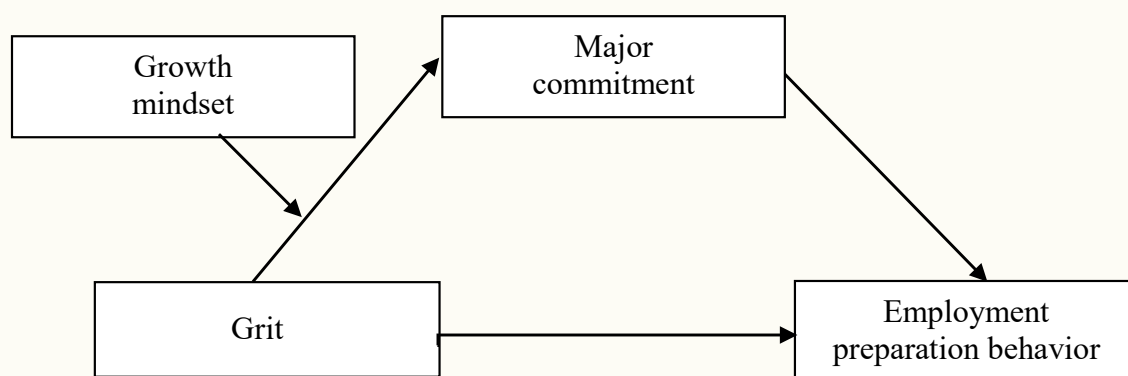


Figure 1 Conceptualized research model

2. Data Collection and Samples

The participants in this study were undergraduate students majoring in airline service at a South Korean university, comprising freshmen (19.7%), sophomores (6.0%), juniors (28.5%), and seniors (45.8%). Data were collected through an online survey between April 28 and May 9, 2025. Upon

obtaining informed consent, a total of 284 airline service majors completed the survey. Following data collection, frequency analyses were conducted to summarize the demographic characteristics of the sample. The gender distribution was 94.7% female and 5.3% male, closely reflecting the actual gender ratio of flight attendants in South Korea [23].

3. Research tools

3.1. Grit

This study employed the unidimensional grit measure adapted from Kang and Lee [4], comprising five items that assess consistency of interest and persistence of effort. Participants majoring in airline service completed a self-report questionnaire in which each item was rated on a 5-point Likert scale (1 = strongly disagree; 5 = strongly agree). Higher total scores indicated greater levels of grit. The internal consistency of the grit scale, as assessed by Cronbach's α , was .958.

3.2. Major commitment

Recent studies have utilized a self-rated major commitment scale among airline service students [6; 24]. Accordingly, this study adopted a unidimensional, five-item measure from Lee & Jeon [24]. Participants rated each item on a 5-point Likert scale (1 = strongly disagree; 5 = strongly agree), with higher scores indicating greater major commitment. The scale demonstrated strong internal consistency (Cronbach's α = .867).

3.3. Growth mindset

Growth mindset was measured using Dweck's instrument [20], as adapted by Park [13] for this study. The scale comprises three items assessing personal characteristics, particularly intellectual abilities. For example, 'I am able to recover quickly from difficulties and setbacks' 'I embrace every failure, as there are always lessons to be learned'. Participants responded on a 5-point Likert scale (1 = not at all; 5 = very much). Cronbach's α for growth mindset was .843.

3.4. Employment preparation behavior

In this study, employment preparation behavior was not derived from academic records (e.g., grade point averages) but was assessed via self-report, consistent with its conceptualization as the application of knowledge gained through major-specific education. The self-report instrument developed by Park & Jeon [3] and Jeon [19] comprises three items rated on a 5-point Likert-type scale, with higher scores indicating greater engagement in employment preparation behavior. The scale demonstrated satisfactory reliability (Cronbach's α = .755).

4. Data analysis

Data were analyzed using two primary statistical software packages. First, SPSS for Windows (version 21.0) was utilized to generate descriptive statistics through frequency analyses, evaluate internal consistency via reliability testing, and assess the magnitude and direction of linear associations among variables using Pearson's correlation coefficients. Second, mediation and moderation analyses were performed using Hayes' PROCESS macro (version 4.3). Moderated mediation effects were tested employing a bias-corrected bootstrap method (5,000 resamples) with a 95% confidence interval, estimating conditional effects at the mean and at one standard deviation above and below the mean ($M, M \pm SD$) [25].

RESULTS

1. Correlation analysis

Pearson's correlation analysis was conducted to investigate the interrelationships among the four primary variables in the present study. As shown in Table 1, statistically significant correlations were

observed among grit, major commitment, growth mindset, and employment preparation behavior, suggesting meaningful associations among these psychological constructs.

Grit was positively correlated with major commitment ($r = .690, p < .01$), and it was positively associated with employment preparation behavior ($r = .378, p < .01$). There was a positive correlation between grit and growth mindset ($r = .654, p < .01$). major commitment had a positive correlation with employment preparation behavior ($r = .442, p < .01$), and it had a positive correlation with growth mindset ($r = .641, p < .01$). There was a positive correlation between growth mindset and employment preparation behavior ($r = .4686, p < .01$). Growth mindset had an average value of 4.7829, which was the highest among the variables.

Table 1

Correlations and descriptive statistics

	Grit	Major commitment	Growth mindset	Employment preparation behavior	M	SD
Grit	1				4.6824	.56328
Major commitment	.690**	1			4.7507	.41059
Growth mindset	.654**	.641**	1		4.7829	.38345
Employment preparation behavior	.378**	.442**	.486**	1	4.5258	.51108
** $p < .01$						

2. Moderated mediating effect of growth mindset

Model 7 of the PROCESS macro for SPSS, developed by Hayes [24], was employed to examine whether growth mindset moderates the mediating effect of major commitment in the relationship between grit and employment preparation behavior. The moderated mediation effect was tested using a bootstrapping procedure with 5,000 resamples and a 95% bias-corrected confidence interval.

Table 2 and Figure 2 present the results of the moderated mediation effect. The direct effects among grit, major commitment, and employment preparation behavior were found to be significant. Specifically, grit had a significant positive effect on major commitment ($\beta = .2917, p < .001$), and major commitment had a significant positive effect on employment preparation behavior ($\beta = .4291, p < .001$), thus showing that major commitment played a mediating role in the link between grit and employment preparation behavior.

The interaction term between grit and growth mindset had a significant effect on employment preparation behavior ($\beta = -.12155, p < .05$), and the increase in R^2 ($\Delta R^2 = .0066, p < .05$) according to the interaction term was also significant; therefore, it was found that the relationship between grit and employment preparation behavior is mediated by major commitment, and this mediating effect is contingent upon the level of growth mindset. The conditional effect of grit according to the value of growth mindset was significant when growth mindset was low ($M-1SD$), mean (M), or high ($M+1SD$). As the growth mindset value increased, it increased the effect of path of grit $\rightarrow$ major commitment $\rightarrow$ employment preparation behavior.

Table 3 shows the results of analyzing the indirect effect on the path from grit to employment preparation behavior. The index of moderated mediation was $-.0522$, and the lower and upper limits of the 95% confidence interval (CI) did not include zero ($-.1544 \sim -.0005$). Based on the results, the moderated mediating effect of growth mindset on the path from grit to employment preparation behavior is verified.

Table 2

Analysis of the moderated mediation effect of growth mindset on the relationship among grit, major commitment, and employment preparation behavior

Mediating variable model (DV: Major commitment)						
Variables	B	SE	t value	p	LLCI*	ULCI**
Constant	4.7676	.0184	258.5914	.0000	4.7313	4.8039
Grit	.2917	.0467	6.2524	.0000	.1999	.3836
Growth mindset	.3266	.0584	5.5907	.0000	.2116	.4417
Grit × Growth mindset	-.1215	.0600	-2.0260	.0437	-.2396	-.0035
Dependent variable model (DV: Employment preparation behavior)						
Variables	B	SE	t value	p	LLCI*	ULCI**
Constant	2.4874	.4356	5.7104	.0000	1.6299	3.3448
Grit	.1274	.0667	1.9095	.0572	-.0039	.2587
Major commitment	.4291	.0915	4.6890	.0000	.2490	.6092
Direct effect of grit on Employment preparation behavior	.1274	.0667	1.9095	.0572	-.0039	.2587
Test of highest order unconditional interaction						
Interaction term	R ²		F		p	
Grit × Growth mindset	.0066		4.1048		.0437	
Conditional effects of grit at values of growth mindset						
Growth mindset	Effect	se	t	p	LLCI*	ULCI**
-.3834	.3383	.0385	8.7991	.0000	.2627	.4140
0	.2917	.0467	6.2524	.0000	.1999	.3836
.2171	.2654	.0552	4.8110	.0000	.1568	.3739
Conditional effects of grit at values of growth mindset						
Growth mindset	Effect	se	t	p	LLCI*	ULCI**
-1.7829	.5084	.0889	5.7177	.0000	.3334	.6835
-1.6876	.4969	.0838	5.9289	.0000	.3319	.6618

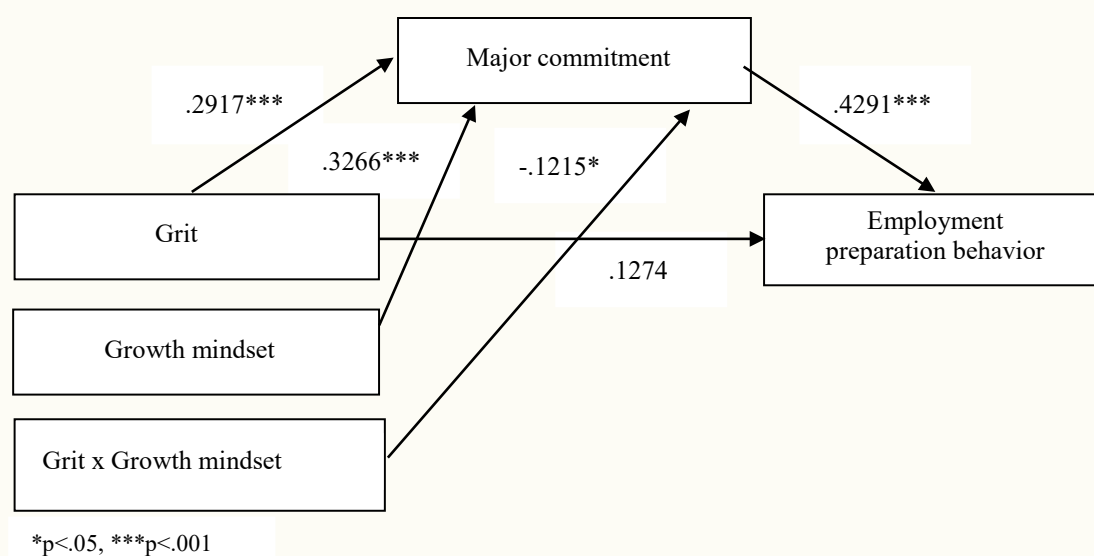


Figure 2 The statistical model of the moderated mediating (growth mindset) effect of growth mindset on the relationship between major commitment and employment preparation behavior

Table 3

Indirect effects of grit on employment preparation behavior

Index of moderated mediation				
Growth mindset	Index	BootSE	BootLLCI*	BootULCI**
	-.0522	.0390	-.1544	-.0005
*LLCI = The lower bound of the indirect effect within the 95% confidence interval				
**ULCI = The upper bound of the indirect effect within the 95% confidence interval				

DISCUSSION

The findings of this study give rise to the following key discussion points. First, grit was positively correlated with major commitment. This finding is consistent with previous studies showing that the higher the grit, the higher the major commitment [5; 18]. Unlike Park's research results [13] in theoretical background, grit did not significantly affect employment preparation behavior. Second, major commitment had a mediating effect on the link between grit and employment preparation behavior. These results are considered in the same context as the research results showing that grit increases major commitment [5] and that major commitment increases employment preparation behavior [13; 15].

Third, growth mindset moderated the relationship between grit and major commitment. In other words, the grit perceived by airline service major students increased their major commitment; however, in this process, the effect of grit on major commitment depends on the degree of growth mindset. Airline service major students with higher levels of grit tend to be more engaged in their academic majors, whereas those with lower levels of grit tend to show lower levels of major commitment. There have been few studies so far examining the moderating effect of the growth mindset, specifically targeting airline service major students.

Fourth, the moderated mediation effect of growth mindset was verified in the path of grit and employment preparation behavior through major commitment. In other words, the indirect effect of grit on employment preparation behavior via major commitment depends on growth mindset; in particular, as one's degree of growth mindset increases, the positive effect of grit on major commitment gradually increases. Growth mindset serves as a mechanism by which grit augments the positive path leading to employment preparation behavior through major commitment.

The academic and practical implications derived from the findings of this study are highly meaningful for future research and practice. From an academic perspective, prior studies have primarily focused on the direct relationship between students' grit and employment preparation behavior, often examining mediating or moderating effects in isolation. However, this study adopted an integrated research model incorporating a moderated mediation framework, thereby offering a more comprehensive understanding of the mechanisms underlying these relationships. This approach provides valuable insights that can be applied to educational settings, particularly in designing interventions that enhance students' employment preparation through the development of grit, major commitment, and growth mindset.

From a practical perspective, students with growth mindset are more likely to pursue challenging goals aimed at developing their competence rather than focusing on evaluations from others [10]. Therefore, in order to promote proactive employment preparation behavior among airline service major students, it is important to foster growth mindset that enables them to set realistic and purposeful career goals [13]. Lee & Tak [26] found that even simple learning experiences such as understanding and writing about the concept of growth mindset can enhance students' growth mindset. According to Svensen's study [27], students with lower academic achievement appear to derive greater benefit from endorsing a growth mindset.

CONCLUSION

The objective of this study is to explore the conditional indirect effect of grit on employment preparation behavior via major commitment, contingent on levels of growth mindset. Informed by prior research, the proposed model posits that growth mindset amplifies the positive relationship between grit and major commitment among students in airline service major. The findings of the study are as follows.

First, the results of the correlation analysis among the key variables revealed that grit was positively associated with both major commitment and employment preparation behavior. Additionally, a significant positive correlation was observed between major commitment and employment preparation behavior. Growth mindset also demonstrated positive correlations with grit, major commitment, and employment preparation behavior.

Second, major commitment was found to mediate the relationship between grit and employment preparation behavior. Specifically, the results indicated that grit did not exert a direct effect on employment preparation behavior; rather, its influence was transmitted indirectly through major commitment.

Third, growth mindset was found to moderate the relationship between grit and major commitment. Specifically, while higher levels of grit among airline service majors were generally associated with stronger major commitment, this relationship was contingent upon the level of growth mindset. Students with higher growth mindsets exhibited a stronger positive association between grit and major commitment, whereas this effect was attenuated among those with lower growth mindsets.

Fourth, the study confirmed a moderated mediation effect of growth mindset in the indirect relationship between grit and employment preparation behavior via major commitment. That is, the strength of the indirect effect of grit on employment preparation behavior through major commitment varied according to the degree of growth mindset. As growth mindset increased, the positive influence of grit on major commitment—and consequently on employment preparation behavior – became more pronounced.

These findings suggest that growth mindset functions as a key mechanism in the context of student counseling. Paunesku et al. [28] emphasized the importance of guiding students to focus more on achievements and growth gained through personal effort rather than on innate talent or ability. Furthermore, providing positive feedback that allows students to view failure as a learning opportunity is essential in supporting the development of a growth mindset. Cai et al. [29] also argued that teacher support plays a pivotal role in mediating the relationship between students' growth mindsets and their academic achievement (e.g., reading performance). When students perceive a high level of teacher support, the positive effects of a strong growth mindset – defined as the belief that abilities can be developed through effort and learning – are more likely to manifest in improved learning outcomes [29].

Therefore, faculty members should support airline service major students in interpreting failures experienced during their academic journey not as indicators of personal incompetence, but as opportunities for self-reflection and guidance for future growth. When faculty members and peers adopt and reinforce a growth mindset, it creates a supportive environment that further enhances students' own growth-oriented thinking. As Yeager et al. [30] suggest, the presence of growth mindset-supportive culture within the school or department can significantly strengthen students' adoption of such a mindset. Accordingly, efforts at the institutional and departmental levels are essential to foster an atmosphere that encourages learning through challenges and setbacks.

Nevertheless, this study has certain limitations, which also suggest directions for future research. First, as a quantitative study utilizing a self-reported online questionnaire, it is difficult to eliminate the potential influence of participants' response biases on the findings. The possibility of inattentive responses or socially desirable answering presents a methodological limitation. Future studies should consider supplementing quantitative methods with qualitative approaches – such as interviews with participants and individuals in their surrounding environments – to explore the relationships among variables in greater depth.

Second, the study sample was limited to students enrolled at a single four-year university, which restricts the generalizability of the findings. Subsequent research should aim to replicate the results using more diverse and representative samples. Lastly, this study employed a cross-sectional design to examine relationships among variables at a single point in time, which does not allow for conclusions about the predictive power of grit, major commitment, or growth mindset on future employment preparation behaviors. Future research should adopt longitudinal designs to systematically investigate causal relationships over time.

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Authors

Aeeun Jeon

(Seosan city, South Korea)
 Doctor of Philosophy, Professor
 Department of Aviation Tourism
 Hanseo University
 E-mail: 140368@daum.net
 ORCID ID: 0000-0003-0110-7048
 Scopus Author ID: 55534629100

Author contribution

Aeeun Jeon: Conceptualization, Methodology, Validation,
 Formal analysis, Investigation, Writing - Original Draft,
 Writing - Review & Editing, Visualization, Funding acquisition

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