

Association of Academic Engagement with Academic Self-Concept and Academic Support in Gifted Students: The Mediating Role of Achievement Motivation

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Abstract

Background: Educational development can be achieved through various means, including the analysis of academic engagement among gifted students. This study aimed to investigate the mediating role of achievement motivation in the association between academic engagement and academic self-concept, as well as academic support, in gifted students.

Methods: This descriptive-correlational study employed path analysis to determine the relationships among the research variables. The statistical population comprised male and female gifted students in junior and senior high schools in Tehran, Iran during 2022-23 academic year. The cluster sampling method was used to select 406 gifted high school students. The participants completed several research measurement tools, namely the Academic Engagement Inventory, Academic Self-Concept Questionnaire, Academic Support Scale, and Achievement Motivation Questionnaire. The proposed model was evaluated using path analysis, and the indirect associations were examined through bootstrapping. The data were analyzed using SPSS version 26 and AMOS version 25, with a significance level set at 0.05.

Results: The mean (\pm SD) scores for academic engagement, self-concept, academic support, and achievement motivation were 27.24 ± 6.03 , 37.22 ± 5.62 , 56.44 ± 18.71 , and 72.00 ± 9.90 , respectively. Positive correlations were found between academic engagement and academic self-concept ($r=0.21$), academic support ($r=0.35$), and achievement motivation ($r=0.42$) among the students. The results revealed significant associations between all direct paths ($P<0.001$), except for the path from academic self-concept to academic engagement. Moreover, significant associations were observed between the indirect paths from academic achievement to academic engagement ($P<0.001$). The proposed model exhibited a good fit according to the results (CFI=0.99, RMSEA=0.001).

Conclusion: Achievement motivation played a mediating role in the associations between academic engagement and academic self-concept, as well as academic support, in gifted students. These findings can serve as a suitable model for designing and developing specific programs aimed at improving academic engagement and enhancing the academic motivation of students.

Keywords: Self-Concept, Engagement, Motivation, Child, Gifted

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1. Introduction

Psychologists and education experts are currently interested in analyzing the psychological, cognitive, personal, and communicative characteristics of gifted students (1). Giftedness refers to clear intellectual, cognitive, innovative, and motivational superiority in an individual compared to their peers, and their ability to contribute something valuable to society. Gifted students demonstrate superiority in various areas when compared to their peers (2, 3). Specifically, gifted and talented individuals exhibit high functionality in specific domains such as intelligence, creativity, art, leadership, and specialized academic fields (4). Within this context, academic engagement

plays a crucial role among gifted students (5). The academic engagement of gifted students is considered an important criterion for evaluating educational systems, and it serves as an indicator of their success (6). Therefore, the level of academic engagement with school subjects can significantly influence the success of students (7, 8).

The types of assignments that students find valuable and meaningful depend greatly on their personality traits, including their academic self-concept (9). The formation of self-concept evaluation is influenced by students' educational experiences and their interpretation of the educational environment. This encompasses personal knowledge and perception of a student's

strengths and weaknesses in a specific field of education, as well as their personal beliefs about their ability to successfully perform academic tasks at the predetermined levels (10, 11). Individuals who perceive themselves as more efficient, reliable, and capable than others in certain tasks tend to have higher levels of academic self-concept. Consequently, this positive self-concept contributes to their academic achievement and future growth, while also preventing negative emotions (12).

Academic support is a significant factor that appears to impact the academic engagement of gifted students (13). Academic support is defined as providing any resources that can directly or indirectly motivate learners to study and enhance their academic achievement (14). The main dimensions of academic support include emotional support (e.g., providing encouragement), instrumental support (such as cooperating on homework assignments), and cognitive support (conveying the importance of academic success to students) (15). There are four primary sources of support for academic activities: fathers, mothers, peers, and teachers. Each of these sources can play a unique role in providing academic support to students (16).

Achievement motivation is a major factor that can affect the academic self-concept and academic support of students, in addition to enhancing academic support (17). Motivation arises from personal needs and is an internal phenomenon that inherently compels a person to be active (18). Motivation plays a pivotal role in justifying behaviors, predicting the outcomes of actions, and directing behaviors towards specific goals. It energizes learners, guides their activities, and shapes their behaviors (19). Numerous studies have indicated a positive and significant association between achievement motivation and academic engagement (20-22).

As discussed earlier, academic engagement serves as a catalyst for students to initiate academic activities. Despite its significance, the academic engagement of gifted students has received limited attention in research literature. Therefore, academic engagement is considered a crucial academic characteristic of students. Given the pivotal role of students in social development and the challenges they face in educational environments, it is essential to develop specific

plans to enhance their academic motivation and academic engagement. Based on the existing literature and research background, the aim of this study was to investigate the mediating role of achievement motivation in the associations between academic engagement and both academic self-concept and academic support in gifted students.

2. Methods

2.1. Design and Participants

In this descriptive-correlation study, path analysis was conducted to determine the associations among the research variables. The statistical population consisted of all male and female gifted students attending junior and senior high schools in Tehran, Iran during 2022-23 academic year. The initial sample size was estimated based on the study variables ($n=400$) (23). The sample size was calculated by considering a 10% attrition rate, resulting in a final sample size of 440 participants. After removing incomplete questionnaires, the final sample included 406 male and female gifted students. The inclusion criteria for participation in the study were as follows: giving consent to participate, studying at high school grades, and completing all questionnaires. The exclusion criteria were unwillingness to continue participation in the study and failure to complete all questionnaires.

2.2. Procedure

The cluster sampling method was employed to randomly select one of the educational districts in Tehran, Iran. After obtaining permission to conduct the research from the education department of the selected district, the researchers determined the number of gifted schools among the male and female students. Five high schools were randomly selected from the gifted schools in the district, comprising three male high schools and two female high schools. The researchers explained the importance and necessity of conducting the research to the management staff of these schools. From each school, three classes were randomly chosen from all available classes, and the research questionnaires were distributed to the students in the selected classes. Ultimately, 406 students met the inclusion criteria and were included in the study.

2.3. Measurement Tools

Academic Engagement Inventory: The Academic Engagement Inventory, designed by Salmela-Aro and Upadaya (24), consists of nine items that measure three subscales: energy (three items), commitment (three items), and captivation (three items). The items are scored on a seven-point scale, ranging from 0 (“never”) to 6 (“everyday”). The minimum and maximum scores on this inventory are 0 and 54, respectively. This study utilized the total score of the tool. A high score on this questionnaire indicates higher levels of academic engagement. Rezaei Varmazyar and colleagues (25) reported a Cronbach’s alpha coefficient of 0.86 for the Academic Engagement Inventory. The Content Validity Index (CVI) and Content Validity Ratio (CVR) for the questionnaire were reported as 0.96 and 0.93, respectively, by Rezaei Varmazyar and colleagues (25). In the present study, the Cronbach’s alpha coefficient was 0.82.

Academic Self-Concept Questionnaire: The Academic Self-Concept Questionnaire assesses various dimensions of academic self-concept, including general, institutional, and non-institutional aspects. This questionnaire focuses on evaluating students’ academic self-concept. It comprises 15 items that are scored on a four-point scale, ranging from 1 (“strongly disagree”) to 4 (“strongly agree”). The minimum and maximum scores for each respondent on this questionnaire are 15 and 60, respectively. Higher scores indicate higher levels of academic self-concept. Afsharizadeh and colleagues (26) reported a Cronbach’s alpha coefficient of 0.87 for this questionnaire. In their research, the Persian version of the Academic Self-Concept Questionnaire demonstrated a CVI of 0.97 and a CVR of 0.94. In the present study, the Cronbach’s alpha coefficient was 0.89.

Academic Support Scale: The Academic Support Scale, developed by Sands and Plunkett (27), comprises 24 items scored on a four-point Likert scale, ranging from 1 (“strongly disagree”) to 4 (“strongly agree”). This questionnaire includes four subscales: academic support from peers, academic support from the father, academic support from the mother, and academic support from the teacher. Each subscale consists of six items. The total score is calculated by summing the scores of the subscales. The minimum and maximum scores on this questionnaire are 24 and 96, respectively.

This study employed the total score of the Academic Support Scale. Samani and Jafari (28) reported a Cronbach’s alpha coefficient of 0.85 for this scale. The Persian version of the Academic Support Scale, according to Samani and Jafari (28), demonstrated a CVI of 0.92 and a CVR of 0.89. Additionally, the Cronbach’s alpha coefficient in our research was 0.79. **Achievement Motivation Questionnaire:** Hermans developed the Achievement Motivation Questionnaire, comprising 290 items (29). The items are scored using a scale of A (1), B (2), C (3), and D (4). However, items 2, 3, 5, 6, 7, 8, 11, 12, 17, 18, 19, 20, 21, 22, 24, 25, and 26 are scored in reverse order as A (4), B (3), C (2), and D (1). The questionnaire’s minimum and maximum scores range from 29 to 116, respectively. Higher scores indicate greater levels of achievement motivation, while lower scores indicate lower levels of achievement motivation. Derakhshanrad and Piven reported a Cronbach’s alpha coefficient of 0.95 for the questionnaire. In their study, the Persian version of the Achievement Motivation Questionnaire demonstrated a CVI of 0.98 and a CVR of 0.97 (30). In the current research, the Cronbach’s alpha coefficient was 0.89.

2.4. Statistical Analyses

Pearson correlation coefficient was used to analyze the associations between variables, while path analysis was conducted to evaluate the proposed model using SPSS version 26 and AMOS version 25. Finally, bootstrapping was employed to determine the significance of mediating associations.

3. Results

According to the demographic findings, the mean ages of male and female gifted students were 16.86 ± 3.34 and 17.12 ± 3.80 years old, respectively. There were 215 (52.96%) male gifted students and 191 (47.04%) female gifted students. Table 1 presents the mean, standard deviation (SD), skewness, kurtosis, and Pearson correlation coefficients of the research variables.

The Pearson correlation coefficients indicated significant correlations between all research variables ($P < 0.001$). Figure 1 illustrates the initial proposed model for explaining academic engagement, which is based on academic self-concept, academic support, and achievement motivation.

Table 1: Mean, standard deviation (SD), skewness, kurtosis, and Pearson correlation coefficients of the research variables

Variables	Mean±SD	Skewness	Kurtosis	1	2	3	4
1- Academic engagement	27.24±6.03	-0.06	-0.18	1			
2- Academic self-concept	37.22±5.62	-0.08	-0.39	0.21**	1		
3- Academic support	56.44±18.71	0.22	-0.99	0.35**	0.25**	1	
4- Achievement motivation	72.00±9.90	0.21	-0.33	0.42**	0.42**	0.37**	1

**P<0.01

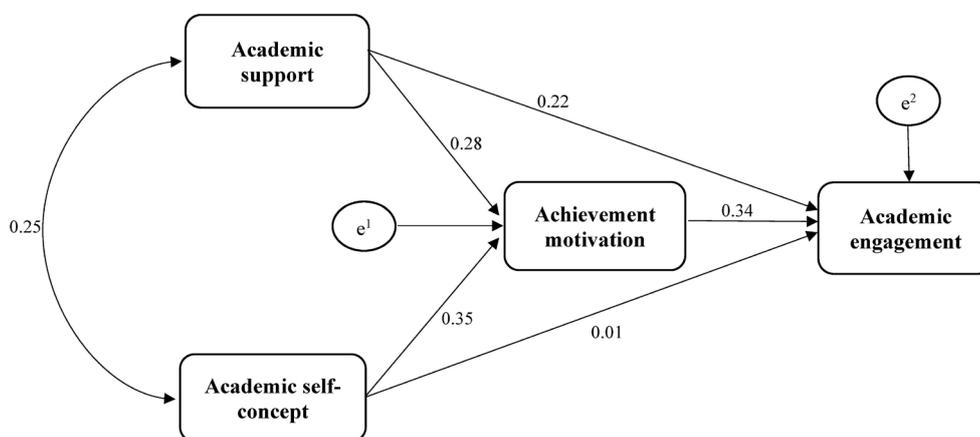


Figure 1: The figure shows the initial model.

Based on Table 2, the root means square error of approximation (RMSEA=0.315) suggested that the initial model required modification. After removing one path (from academic self-concept to academic engagement), the root means square error of approximation (RMSEA=0.001) indicated that the final model fit well. Figure 2 displays the modified model.

Table 3 presents the findings regarding the estimation of path coefficients to analyze direct and indirect associations. The results demonstrated a significant association between academic self-concept and achievement motivation in gifted students (P=0.001). Additionally, there was a direct association between academic support and academic engagement, as well as achievement motivation (P=0.001).

Table 2: Fit indicators of the initial and final models

Fit indicators	χ^2	df	(χ^2 /df)	TLI	CFI	RFI	NFI	RMSEA
Initial model	-	-	-	0.81	-	-	0.88	0.315
Modified model	0.027	0.027	0.99	0.99	0.99	0.99	0.99	0.001

TLI: Tucker Lewis Index; CFI: Comparative Fit Index; RFI: Relative Fit Index; NFI: Normed Fit Index; RMSEA: Root Mean Square Error of Approximation

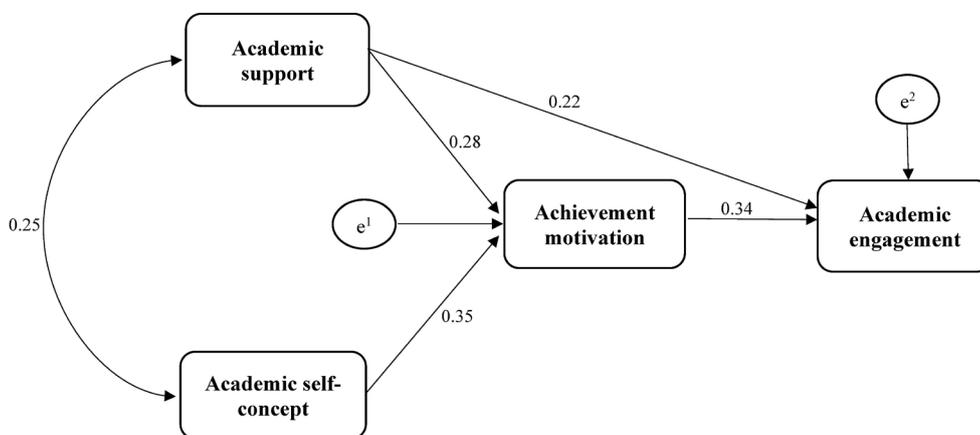


Figure 2: The figure shows the modified model.

Table 3: Direct and indirect path in the initial and modified models

Paths	Initial model		Modified model	
	β	P	β	P
Academic self-concept to academic engagement	0.01	0.869	-	-
Academic self-concept to achievement motivation	0.35	0.001	0.35	0.001
Academic support to academic engagement	0.22	0.001	0.22	0.001
Academic support to achievement motivation	0.28	0.001	0.28	0.001
Achievement motivation to academic engagement	0.34	0.001	0.34	0.001
Academic support to academic engagement through achievement motivation	0.031	0.010	0.031	0.010
Academic self-concept to academic engagement through achievement motivation	0.127	0.010	0.129	0.010

The association between achievement motivation and academic engagement was positive and significant ($P=0.001$). However, the results indicated no significant association between academic self-concept and academic engagement in the students ($P=0.869$).

According to Table 3, there was a significant indirect path from academic self-concept to academic engagement, mediated by achievement motivation ($P=0.010$). Furthermore, there was a significant indirect path from academic support to academic engagement, also mediated by achievement motivation ($P=0.010$).

4. Discussion

The aim of this study was to investigate the mediating role of achievement motivation in the associations between academic engagement, academic self-concept, and academic support among gifted students. The first research finding indicated no significant associations between academic self-concept and academic engagement among gifted high school students. This finding contradicts previous research results. Zhang and colleagues (31) reported a positive, direct, predictive effect of academic self-efficacy on students' academic engagement. Similarly, Ebadolahi and colleagues (32) found that self-concept was able to predict academic engagement in high school students. These inconsistent results can be attributed to variations in statistical populations, sample sizes, questionnaires, and tools used for analyzing research variables.

To explain the results of this finding, it can be argued that self-concept, belief in one's abilities, and competence, along with academic self-concept as a characteristic, can influence the levels of

academic engagement, performance in academic assignments and activities, selection of educational goals, efforts, diligence, and cognitive strategies adopted by gifted students (31). Therefore, it is crucial for students to experience positive expectations and for their self-esteem to improve in relation to their personal capacities and attitudes towards success and achievement. Furthermore, providing appropriate conditions for students to be further motivated and acquire successful experiences is important, as increasing positive self-concept is correlated with better goal setting, increased efforts, utilization of more appropriate strategies, and higher levels of engagement in assignments (12).

According to the results, there was a significant association between academic support and academic engagement in gifted high school students. This finding is consistent with the research results of previous research (5). Additionally, Maleki (33) reported a positive relationship between academic support and academic engagement in students, which aligns with the results of this study. The results indicated that support from the father, mother, teacher, and peers counteracted the negative effects of stress and heavy subjects on students. These forms of support could enhance their self-esteem and self-worth.

The main components of academic support include emotional support, instrumental support, and cognitive support. The primary sources of support for academic activities are the father, mother, teacher, and peers. Each of these sources can play a unique role in providing academic support to students (5). They convey values and expectations, offer guidance and feedback to help students achieve those values and expectations, create a secure environment for activities aligned

with those values and expectations, and provide emotional support. In essence, academic support for students is a multifaceted topic. The interactions between teachers and students, teachers and parents, and parents and teachers form various combinations of academic support (15). Each of these interactions can individually or collectively play significant roles in improving students' academic well-being (16).

The results also indicated a significant association between achievement motivation and academic engagement in gifted high school students. This finding is consistent with the research findings of previous studies (20, 22). Dunn and Kennedy (20) reported that motivations predict engagement in students. In other words, academic achievement, success, and their relevant factors are research priorities in education and are considered by school administrators.

The concept of academic engagement is a key factor that affects students' success. Students with higher levels of achievement motivation have greater energy to engage in academic activities, leading to more academic achievements and a deeper sense of academic engagement (21). Since all academic outcomes and results are interconnected, students can experience higher levels of psychological adjustment and demonstrate better social skills by utilizing sufficient competencies to effectively manage stimulating situations. Consequently, they experience more positive emotions and increased satisfaction.

Academic engagement refers to a student's assessment of their abilities to meet predetermined performance standards. As a major component of the "self" system, academic engagement pertains to an individual's perceived ability to perform a task or handle specific situations (24). Moreover, optimal reactions and mental health play vital roles in achieving satisfactory performance. Therefore, students with higher levels of achievement motivation are likely to experience greater academic engagement, well-being, and satisfaction compared to others in educational and academic domains (30).

According to the results, a significant association was found between academic self-concept and academic engagement in gifted high school students, which was mediated by

achievement motivation. No similar studies were available regarding this finding. The results also indicated that academic self-concept did not have a significant association with academic engagement. However, the indirect hypothesis suggested that academic self-concept affected academic engagement only when it first increased students' achievement motivation. Additionally, there was a significant association between academic support and academic engagement, which was mediated by achievement motivation. No similar studies were found on this particular finding. The direct association revealed that academic support had a significant impact on academic engagement. However, the indirect hypothesis suggested that academic support improved academic engagement by enhancing students' achievement motivation.

In general, the school environment can be considered a valuable asset for educational spaces, as it greatly contributes to the creation and sharing of knowledge, as well as the improvement of academic achievement and engagement among students (33). Constructive support provided by others can play a crucial role in an individual's achievements and success. By learning to adapt to others, students can develop skills that benefit their personal and social lives. This skill can be acquired through group activities, the exploration of different preferences, and the guidance of teachers (27).

It is important to be cautious when generalizing the results of this study to other students in different districts, cities, and grades, due to the limited statistical population among gifted high school students in Tehran, Iran. The use of quantitative research methods can be considered a limitation of this study, as more comprehensive findings could have been obtained by employing qualitative research methods, such as structured and semi-structured interviews. Furthermore, it is worth noting that the data collected for this study was based on self-report questionnaires, and therefore, the results should be interpreted with caution.

4. Conclusion

The proposed conceptual model exhibits a good fit; therefore, it can be deemed an innovative scientific finding that holds the potential to effectively enhance academic engagement. Based on the research findings, it is strongly recommended

that families and teachers acquire a comprehensive understanding of the various forms of academic support, while recognizing the significance of this issue. By doing so, they can effectively contribute to averting academic failure and discouragement among students. In addition, education experts and officials should meticulously design educational environments and school curricula to enable gifted students to further leverage the positive aspects of their personalities and behaviors. Consequently, substantial progress can be made towards fostering academic engagement, bolstering academic motivation, and alleviating academic discouragement among students.

Ethical Approval

The study was approved by the Ethical Committee of Islamic Azad University- Ahvaz Branch with the code of IR.IAU.AHVAZ.REC.1402.004. Also, written informed consent was obtained from the participants.

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Authors' Contribution

ZH: Substantial contributions to the design of the work, data acquisition, analysis, and interpretation, drafting the manuscript. HJ: Substantial contributions to the conception of the work, drafting, and critical revision of the manuscript. FH: Substantial contributions to the conception of the work, data acquisition, analysis, and interpretation, drafting and critical revision of the manuscript. All authors have read and approved the final manuscript and agree to be accountable for all aspects of the work, such that the questions related to the accuracy or integrity of any part of the work.

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