Minnesota Journal of Business Law and Entrepreneurship

Volume 2026, No. 2

ISSN: 1540-3270

From Emotion to Engagement: Examining the Mediating Role of Self-Esteem among College Students

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Abstract

The study aims to evaluate the relationship between Emotional Intelligence and Academic Engagement, and the mediating role of Self-Esteem in the relationship between Emotional Intelligence and Academic Engagement. Study was conducted with 250 college students drawn from Chandigarh. Through the use of Partial Least Square Structural Equation Modelling (PLS-SEM), the study's findings demonstrated that emotional Intelligence and self-esteem positively influence academic engagement. Furthermore, Self-esteem mediates in the relationship between emotional Intelligence and academic engagement. This paper also explores implications and future research directions.

Keywords: Emotional regulation; Emotional Intelligence; Self-worth; Self-Esteem; Student engagement; behavioural engagement; Academic Engagement.

1 Introduction

As positive psychology has expanded, human strengths and positive psychological traits have drawn a lot of attention. Researchers have concentrated on "engagement," which is motivated and fulfilling mindset toward work responsibilities typically reflected in Vigor, dedication, and absorption (Schaufeli and Bakker, 2004). Engagement is a multifaceted notion influencing learners' motivation, emotions, behaviour and thought processes (Robinson and Hullinger, 2008; Sharma and Bhaumik, 2013). Engagement in educational context, research has examined from various angles, such as teacher engagement, student course engagement, school engagement, and study engagement (Fredricks, Blumenfeld and Paris, 2004; Deng *et al.*, 2022; Xu *et al.*, 2022). Several theoretical frameworks along with propositions were developed to explain concept of engagement , with models and theories created by (Fredricks, Blumenfeld and Paris, 2004) and (Schaufeli *et al.*, 2002) broadly acknowledged and employed across empirical investigations. The engagement framework introduced by Fredricks, Blumenfeld and Paris, (2004) characterises engagement as a flexible and dynamic concept that includes behavioural, cognitive, and emotional components that are, they contend, interrelated.

Academic engagement can be described as a psychological conditions that reflects learner’s feeling of connectedness, their belief in the importance of education, and active involvement in classroom sessions, academic learning, self-study and co-curricular activities (Schaufeli and Salanova, 2002; Glanville and Wildhagen, 2007). Vigor, defined as the energy, willingness, and perseverance to try to finish college work; dedication, defined as the feeling of enthusiasm, motivation, pride and significance that individuals associate with it; and absorption, which reflects deep concentration, effortless involvement, and inherent enjoyment in academic tasks, are characteristics of academic engagement that make time seem to fly by and make it difficult to disengage from activities (Schaufeli and Salanova, 2002). Higher levels of academic engagement enhance the values, abilities, and competencies required for academic success while also lowering negative behaviours, allowing people to transition successfully (Martos *et al.*, 2018; Fredricks *et al.*, 2019). Understanding predictors of engagement in learning are still important because it is a crucial component that affects students' overall success.

Emotional intelligence is also essential for managing challenging situations, preserving mental health, and achieving academic success (Parhiala *et al.*, 2018; Guil *et al.*, 2021). Emotional Intelligence (EQ) is the capability to perceive, regulate, and interpret both personal feelings and the emotional states of others (Brackett and Salovey, 2006). This ability involves utilizing emotional intelligence in making decisions, solving problems, and interacting effectively with others. A person possessing higher Emotional Intelligence recognizes themselves extremely well and can sense others' emotions. Their traits include resilience, optimism, and sociability (Brackett, Rivers and Salovey, 2011). According to increased amount of research, Emotional Intelligence is widely considered an important factor influencing academic outcomes, psychological well-being, as well as work performance for everyone from interns to managers (Serrat, 2017; Dimitrijevic, Jolic Marjanovic and Dimitrijevic, 2018; Libbrecht *et al.*, 2014). Other than Emotional Intelligence, self-esteem significantly contributes to their academic engagement (Lim and Lee, 2017). One's attitude toward oneself, whether favorable or bad, the concept is known as self-esteem represents how much a person likes or dislikes themselves (Rosenberg *et al.*, 1995). Students' perceptions of their own worth and abilities, whether good or negative, are what matter in an educational setting (Rosenberg, 1979; Rosenberg *et al.*, 1995). Individuals who possess strong self-esteem display higher levels of activity, optimism, and social participation than individuals with diminished self-esteem (Orth and Robins, 2022). Developing self-esteem is crucial for tackling challenges and fostering a positive self-concept (Turki *et al.*, 2023). This present research investigated how self-esteem mediates the link between academic engagement and emotional intelligence in Chandigarh-based college students.

2 Literature review

2.1 Emotional Intelligence

Emotional Intelligence (EQ) was defined as capacity to identify, monitor, and comprehend both personal emotions and the emotions of others (Brackett and Salovey, 2006). This skill also includes applying this emotional intelligence to decision-making, problem-solving, and interpersonal communication. A person with higher Emotional Intelligence recognizes themselves extremely well and can sense others' emotions. Their traits include resilience, optimism, and sociability (Brackett, Rivers and Salovey, 2011). According to increased amount of research, Emotional Intelligence is generally a good indicator of academic achievement, psychological well-being, and work performance for everyone from interns to managers (Serrat, 2017; Dimitrijevic, Jolic Marjanovic and Dimitrijevic, 2018; Libbrecht *et al.*, 2014). Consequently, these notable contributions in several domains highlighted EQ as one of the essential components to assist individuals from all backgrounds in efficiently managing a variety of stressors related to their lives and careers.

Perceiving emotion, using emotion to help think, comprehending emotion, and controlling emotion are the four dimensions of emotional intelligence (Brackett and Salovey, 2006). Perceiving emotions is the capacity to identify and differentiate between one's own and other people's feelings. Those that are knowledgeable in this field will navigate their emotional intelligence while they handle circumstances and are thrilled to learn about it. Second, the ability to engender feelings and then utilize them to reason out ideas is the focus of the thinking facilitation branch, sometimes known as the use of emotion to facilitate thought (Brackett and Salovey, 2006). Third, the ability to comprehend intricate emotional chains and feelings is referred to as emotional comprehension. Fourth, emotional management refers to a person's capacity to regulate and control their feelings toward both herself and other people (Brackett and Salovey, 2006). The ability to accurately observe, categorize, and identify one's emotions as well as know how to improve or modify them is known as emotion management.

2.2 Self-Esteem

One's attitude toward oneself, whether favourable or bad, is referred to as self-esteem. It is also seen as a sign of self-liking or disliking (Rosenberg *et al.*, 1995). Students' perceptions of their own worth and abilities, whether favourable or unfavourable, are what matter in an educational setting (Rosenberg, 1979; Rosenberg *et al.*, 1995).

Compared to people with low self-esteem, those with high self-esteem are more energetic, upbeat, and socially involved (Orth and Robins, 2022).

Building self-esteem is essential to overcoming challenges and creating a positive self-image (Turki *et al.*, 2023). According to Lim & Lee (2017), self-esteem is a psychological construct that can act as a motivator for academic engagement. Based on expectation-value theory, academic engagement can be anticipated through an individual's positive evaluation of their own abilities (Fang, 2016). A positive correlation was found between academic engagement and self-esteem, Self-esteem effected the fields related to academic engagement (Sirin and Rogers-Sirin, 2004). An individual's degree of academic involvement can be predicted by self-esteem (Filippello *et al.*, 2021).

2.3 Academic Engagement

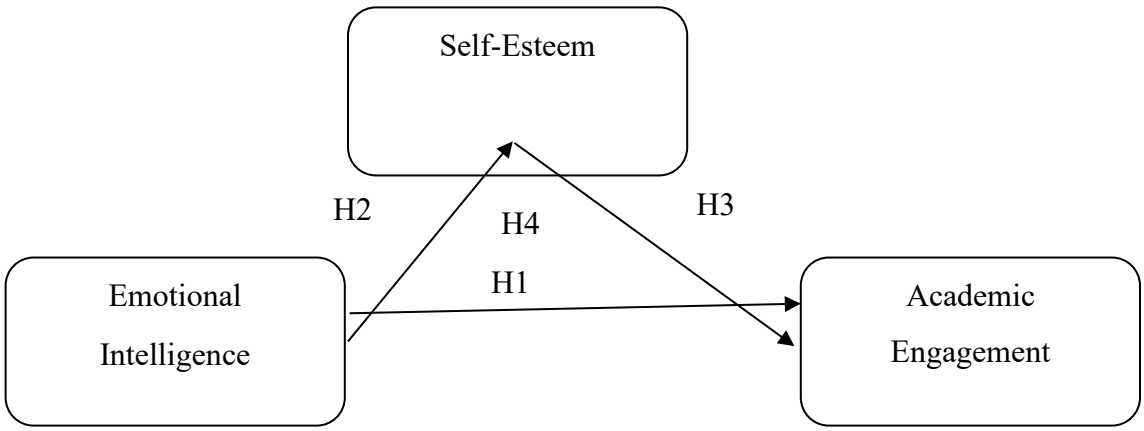
Academic engagement can be described as a psychological state defined by a student's sense of belonging, their belief in the importance of education, and their participation in class, learning, studying, and extracurricular activities(Schaufeli and Salanova, 2002; Glanville and Wildhagen, 2007). Academic engagement is particularly characterised by vigor, dedication, and absorption (Schaufeli and Salanova, 2002). A higher degree of academic engagement reduces engaging behaviors and enhances the competences, skills, and values required for academic success, allowing people to transition successfully.

(Martos *et al.*, 2018; Fredricks *et al.*, 2019). However, in spite of its advantages, not all individuals shows high level of academic engagement (Salmela-Aro *et al.*, 2016).

3 Theoretical background and hypotheses development

The literature research and the development of hypotheses that we experimentally investigate in the current study serve as the foundation for the conceptual model shown in figure 2.

Figure 1 The conceptual model



3.1 Theoretical underpinning

This study uses Self-Determination theory as a theoretical background to explain how emotional Intelligence and self-esteem of a student influences one's academic engagement. Self-determination theory highlights the need to enhance student's internal motivational resources is viewed as a key role of educators in promoting deep and meaningful engagement (Reeve and Halusic, 2009). In the 1980s, self-determination theory was developed as an organism theory in psychology to explain how human motivation and performance develop overall. It places special emphasis on the essential psychological needs of autonomy, competence, and relatedness, which either support or contradict intrinsic motivation, self-regulation, well-being, and performance (Deci and Ryan, 2000).

3.2 Emotional Intelligence and Academic Engagement

(Villegas *et al.*, 2021) investigated effects of self-efficacy and emotional intelligence on Thai undergraduate students' academic engagement. 395 undergraduate students from a private university in Thailand provided the data. Findings indicated that academic engagement and self-efficacy are positively impacted by emotional intelligence.

Barragan Martín *et al.*, (2021) examined the connection between academic engagement, self-esteem, and emotional intelligence. It also looked into mediating influence of self-esteem in the association between teenage engagement and emotional intelligence. 1287 pupils from Spanish public high schools provided the data. The findings demonstrated that self-esteem and the emotional intelligence components were positively correlated with vigor, dedication, and absorption. Additionally, the mediation models demonstrated how adolescent engagement is directly impacted by emotional intelligence. The association between intrapersonal characteristics, stress management, emotional intelligence adaptability, and engagement was mediated by self-esteem.

Baños et al., (2023) explored the link between emotional intelligence and academic engagement, with particular attention to the mediating effect of academic self-efficacy. Participants included 1,164 Mexican students. The findings demonstrated that academic self-efficacy is positively and directly impacted by emotional clarity and restoration. In addition, emotional repair predicted behavioural and emotional engagement. Additionally, it was discovered that academic self-efficacy significantly increases behavioural and emotional engagement while lowering behavioural and emotional disaffection, making it a superb mediator between emotional clarity and repair and the aspects of academic engagement.

H1: There is a significant impact of emotional Intelligence on academic engagement.

3.3 Emotional Intelligence and Self-Esteem

Cheung et al., (2015) explored the link between emotional intelligence and self-esteem. This Study further studied positive effect of social competence on Self-Esteem. Data was collected from 450 undergraduates' students studying in Hong Kong China. The findings illustrated that Emotional Intelligence was found to be the strong determinant of self-esteem. The findings suggested that increasing emotional intelligence is important for strengthening the foundation of young adults' self-esteem.

Bibi et al., (2016) examined the relationship between emotional intelligence and self-esteem among Pakistani university students. 250 students from Pakistani universities in Rawalpindi and Islamabad provided the data. Pearson The association between emotional intelligence and self-esteem among Pakistani university students was investigated using the product moment of correlation. Gender differences in emotional intelligence and self-esteem were examined using an independent t-test. The findings showed a substantial correlation between self-esteem and emotional intelligence. Furthermore, compared to male pupils, female students exhibited stronger emotional intelligence.

H2: There is a significant impact of emotional Intelligence on self-esteem.

3.4 Self-Esteem and Academic Engagement

Zhao et al., (2021) analysed how perceived social support moderates, and academic self-efficacy mediates, the association between adolescents' self-esteem and their academic engagement. 480 adolescents from China's Hebei Province were asked to fill out anonymous surveys. The research outcomes demonstrated that educational involvement is positively correlated with adolescent self-esteem. Adolescents with higher self-esteem tend to show greater involvement in their studies.

Savitri et al., (2023) investigated the effect of life satisfaction and self-worth on the involvement of active university students in Bandung City, Indonesia. 397 current Bandung City university students participated in this

study as respondents. According to the findings, university students' engagement was positively impacted by both life happiness and self-esteem, either fully or partially. University students' combined contributions to student engagement are more than their individual contributions when they are self-assured and satisfied with their lives. Aside from that, student engagement was more influenced by self-esteem than by life satisfaction.

H3: There is a significant impact of self-esteem on academic engagement.

3.5 Emotional Intelligence, Self-Esteem and Academic Engagement

(Barragán Martín *et al.*, 2021) examined the connection between academic engagement, self-esteem, and emotional intelligence. It also looked into mediating influence of self-esteem in the association between teenage engagement and emotional intelligence. 1287 pupils from Spanish public high schools provided the data. The findings demonstrated that self-esteem and the emotional intelligence components were positively correlated with vigor, dedication, and absorption. Additionally, the mediation models demonstrated how adolescent engagement is directly impacted by emotional intelligence. The association between intrapersonal characteristics, stress management, emotional intelligence adaptability, and engagement was mediated by self-esteem.

H4: Self-esteem mediates the relationship between emotional Intelligence and academic engagement.

4 Methodology

The current study is essentially empirical in nature, using both online and offline methods to gather primary data using a questionnaire survey.

4.1 Participants and procedures

The survey approach was employed to gather quantitative data. Full-time undergraduate and graduate students enrolled in Chandigarh-based institutes connected to Punjab University, Chandigarh, a public university in North India, were the study's target group. The university is frequently included in global university rankings, including the Times Higher Education (THE) World University Rankings and the QS World University Rankings. Students at Chandigarh's colleges come from a variety of geographic and cultural backgrounds, making them a good representative sample. Data was gathered from the randomly chosen students at five out-of-the-ordinary colleges. Using the G* Power software, power analysis was conducted to determine the required sample size (Faul *et al.*, 2009). The minimum sample size was 218 with significance level set at 0.05, an effect size of 0.05, and statistical power of 0.95. Finally, 250 responses were received and analysed.

As seen in Table 1, majority of students were female (65.89%) who are undergraduates (87.6%). 65.5% are from Commerce discipline.

Table 1 The respondents' demographic characteristics

Variable	Category	Frequency	Percentage
Gender	Male	88	34.11
	Female	170	65.89
Class	Graduation	226	87.60
	Post Graduation	32	12.40
Discipline	Commerce	169	65.50
	Arts	60	23.26
	Science	12	4.65
	Computer	12	4.65
	Others	5	1.94

4.2 Measurements

A 16 items scale adopted from (Law, Wong and Song, 2004) was used to measure Emotional Intelligence. It was assessed using a 7-point likert scale scale, ranging from 1 (strongly disagree) to 7 (strongly agree). A 17 items scale adopted from (Schaufeli *et al.*, 2002) was employed to measure Academic engagement. It was assessed using a 5-point likert scale scale, ranging from 1 (strongly disagree) to 5 (strongly agree). A brief version of (Gnambs, Scharl and Schroeders, 2018) was used to measure self-esteem scale. A 4-point Likert scale was employed with 1 (Strongly disagree) to 4 (Strongly agree). Class and gender were employed as demographic control variables. The degree of outcome variables employed, particularly in self-esteem and academic engagement, is often determined by these criteria. Gender was measured as a dummy variable, with codes 0 and 1 for male and female, respectively, while class was measured in two categories: undergraduate and postgraduate courses.

5 Data collection and analysis

Data was collected through standardised questionnaire and students were approached through online and offline mode. The researcher has used Likert scale for collecting responses. Partial Least Square Structural Equation Modelling (PLS-SEM) (*Ringle, C. M., Wende, S., & Becker, J. M. (2024). SmartPLS 4. SmartPLS. - References - Scientific Research Publishing*, no date) is adopted to understand and explore the relationship among variables and to test the hypotheses. Principal component analysis, a series of regression analyses, and path analysis are all combined in the PLS–SEM approach (Chin, 1998). When the data has a non-normal distribution, PLS-SEM works better since it can handle smaller sample sizes (Hair, Matthews and Matthews, 2017).

5.1 Common Method Bias

Before estimating the model, the data were checked for common method bias (CMB). CMB may exist in researches where variables are latent and measured through instruments on similar type of scales. Common method variance occurs when a bias exists due to the method of measurement used in research and not by the structural relationships in the model. This type of bias can occur because of various reasons such as the effect of general instructions in the beginning of instrument in influencing different people to give response in a similar direction, thus leading to a shared common variance among the various items (Kock, 2015). According to full collinearity approach, inner VIF values of the constructs are tested against a random endogenous variable and all inner VIF values were under 5,no significant multicollinearity were detected among the model's variables (Hair et al., 2019 ; James et al., 2013).

Table 3 Full Collinearity test

Constructs	VIF
Academic Engagement (Absorption)	3.5
Academic Engagement (Dedication)	3.58
Academic Engagement (Vigor)	2.69
Emotional Intelligence (Others Emotion Appraisal)	1.48
Emotional Intelligence (Regulation of Emotion)	1.63
Emotional Intelligence (Self Emotion Appraisal)	1.55
Emotional Intelligence (Use of Emotion)	1.16
Self-Esteem	1.17

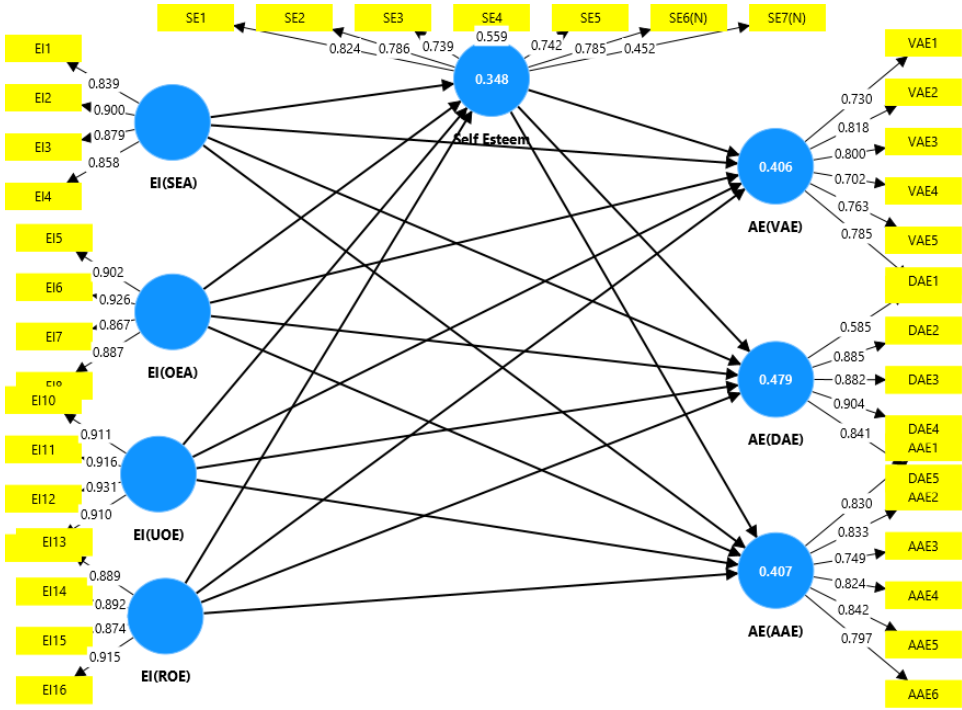
5.2 Assessment of measurement model

Analyzing the constructs' internal consistency, convergent validity, discriminant validity, and indicator reliability is part of evaluating the measurement model. If the item loadings have a value of 0.707 or higher, indicator reliability is proven (Chin, 2010 ; (Hair *et al.*, 2019). Composite reliability and Cronbach's alpha were used to assess the constructs' reliability; the first metric was considered liberal, whereas the second was more conservative. Within these two ranges, a construct's true reliability is represented by Rho (ρA), as proposed by (Dijkstra and Henseler, 2015). The above measures falling between 0.70 and 0.95 are recommended for establishing the reliability of constructs (Ringle *et al.*, 2020). Convergent validity of a construct is satisfactory when its average variance extracted(AVE) exceeds 0.5 (Hair *et al.*, 2010) as this indicates the variation of the measured items being more than 50% explained by the construct.

5.2.1 Measurement model assessment of first-order constructs

Cronbach's Alpha values vary from 0.802 to 0.934, and Composite Reliability values range from 0.872 to 0.943, according to the results, as shown in Table 4 and Figure 2. This suggests that all first-order reflectively assessed constructs have both Cronbach's Alpha and Composite Reliability values exceeded the recommended threshold of 0.708 (Hair, Jr. *et al.*, 2016; Hair, Howard and Nitzl, 2020), indicating a relatively high FOC reliability.

Figure 2 The measurement model (PLS Algorithm)



(Dijkstra and Henseler, 2015) When rho_A is evaluated, all constructions have values between 0.816 and 0.940, all of which are above the 0.70 minimum limit value, indicating good convergent validity (Hair, Howard and Nitzl, 2020). Indicator reliability is established if the item loadings have a value of 0.707 or above (Chin, 2010 ; (Hair *et al.*, 2019). The items with outer loadings less than 0.4 were deleted i.e. three items from Self Esteem Scale (i.e., "I Certainly feel useless at times" and "I wish I could have more respect for myself" and "All in all, I am inclined to feel that I am a failure") were deleted. Two items of Self-esteem have a loading of less than 0.707,

these items were not removed as the AVE is more than 50% (Hair *et al.*, 2019). This implies that FOC's convergent validity is firmly established.

Table 4 The measurement model of FOC

Construct	Items	Factor Loadings	Cronbach's Alpha	rho-A	Composite Reliability	Average Variance Extracted
Academic Engagement (Absorption)	AAE1	0.83	0.897	0.898	0.921	0.661
	AAE2	0.833				
	AAE3	0.749				
	AAE4	0.824				
	AAE5	0.842				
	AAE6	0.797				
Academic Engagement (Dedication)	DAE1	0.585	0.879	0.903	0.914	0.686
	DAE2	0.885				
	DAE3	0.882				
	DAE4	0.904				
	DAE5	0.841				
Academic Engagement (Vigor)	VAE1	0.73	0.86	0.865	0.895	0.589
	VAE2	0.818				
	VAE3	0.8				
	VAE4	0.702				
	VAE5	0.763				
	VAE6	0.785				
Emotional Intelligence (Others-Emotions Appraisal OEA)	EI5	0.902	0.918	0.920	0.942	0.802
	EI6	0.926				
	EI7	0.867				
	EI8	0.887				
Emotional Intelligence (Regulation of Emotion ROE)	EI13	0.889	0.915	0.917	0.94	0.797
	EI14	0.892				
	EI15	0.874				
	EI16	0.915				
Emotional Intelligence (Self-Emotions Appraisal SEA)	EI1	0.839	0.892	0.895	0.925	0.756
	EI2	0.9				
	EI3	0.879				
	EI4	0.858				

Emotional Intelligence (Use of Emotion UOE)	EI10	0.911	0.937	0.938	0.955	0.841
	EI11	0.916				
	EI12	0.931				
	EI9	0.91				
Self-Esteem	SE1	0.824	0.831	0.857	0.873	0.504
	SE2	0.786				
	SE3	0.739				
	SE4	0.559				
	SE5	0.742				
	SE6(N)	0.785				
	SE7(N)	0.452				

Discriminant validity of a construct refers to the degree by which it is empirically distinct relative to other latent variables in structural model. Heterotrait-Monotrait (HTMT) ratio was suggested to be better in comparison to Fornell-Larcker criterion (Fornell and Larcker, 1981) for examining discriminant validity of constructs (Henseler, Ringle and Sarstedt, 2015); therefore, data were analysed for discriminant validity using HTMT criterion. HTMT values less than 0.85 for conceptually distinct constructs establishes discriminant validity. Bootstrapping was run to infer the significance of HTMT value being different form 1.00. Assessment of convergent validity measures are given in table 5 demonstrates the discriminant validity assessment with HTMT criterion. The results show that every construct in the model has been validated and found to be reliable in accordance with the suggested standards.

Table 5 Discriminant validity- HTMT Matrix

	AE(AAE)	**AE(DAE)**	**AE(VAE)**	**EI(OEA)**	**EI(ROE)**	**EI(SEA)**	**EI(UOE)**	**Self Esteem**
AE(AAE)								
AE(DAE)	0.915 (0.859,0.956)							
AE(VAE)	0.873 (0.784,0.935)	0.901 (0.83, 0.949)						
EI(OEA)	0.443 (0.287, 0.579)	0.513 (0.362,0.642)	0.452 (0.281,0.598)					
EI(ROE)	0.632 (0.507, 0.734)	0.699	0.657	0.549 (0.406,0.668)				

		(0.574,0.794)	(0.524,0.759)					
EI(SEA)	0.555 (0.417, 0.67)	0.642 (0.51, 0.75)	0.573 (0.418,0.699)	0.741 (0.609,0.835)	0.695 (0.568,0.791)			
EI(UOE)	0.603 (0.479, 0.705)	0.704 (0.585,0.796)	0.642 (0.507,0.746)	0.736 (0.618,0.825)	0.829 (0.765,0.881)	0.887 (0.824,0.932)		
SE	0.538 (0.384,0.665)	0.512 (0.346,0646)	0.493 (0.301,0.638)	0.415 (0.244,0.556)	0.478 (0.334,0.591)	0.589 (0.446,0.703)	0.623 (0.48,0.732)	

Note: 5% and 95% bias corrected confidence intervals in parentheses.

Cross-loadings are an additional metric for discriminant validity. Table 6 indicates that discriminant validity is good because all of the items' loadings are more strongly on their respective parent constructs than on the items' from other constructs indicating Discriminant validity has been established according to these measures.

Table 6 Cross-loading

	AE(AAE)	**AE(DAE)**	**AE(VAE)**	**EI(SEA)**	**EI(OEA)**	**EI(UOE)**	**EI(ROE)**	**Self-Esteem**
AAE1	**0.830**	0.649	0.627	0.395	0.381	0.426	0.463	0.414
AAE2	**0.833**	0.683	0.658	0.437	0.356	0.494	0.466	0.371
AAE3	**0.749**	0.625	0.551	0.392	0.409	0.431	0.433	0.381
AAE4	**0.824**	0.596	0.607	0.365	0.26	0.406	0.494	0.406
AAE5	**0.842**	0.683	0.637	0.373	0.236	0.426	0.449	0.398
AAE6	**0.797**	0.746	0.649	0.466	0.326	0.513	0.486	0.418
DAE1	0.453	**0.585**	0.446	0.322	0.24	0.338	0.403	0.23
DAE2	0.723	**0.885**	0.694	0.47	0.418	0.563	0.515	0.431
DAE3	0.734	**0.882**	0.694	0.524	0.4	0.555	0.554	0.44
DAE4	0.746	**0.904**	0.726	0.515	0.437	0.649	0.584	0.467
DAE5	0.684	**0.841**	0.666	0.512	0.404	0.521	0.521	0.35
VAE1	0.499	0.531	**0.730**	0.384	0.305	0.449	0.42	0.347
VAE2	0.642	0.645	**0.818**	0.42	0.297	0.485	0.475	0.353
VAE3	0.565	0.637	**0.800**	0.5	0.409	0.515	0.476	0.406
VAE4	0.585	0.511	**0.702**	0.296	0.292	0.384	0.46	0.278
VAE5	0.619	0.609	**0.763**	0.347	0.287	0.362	0.368	0.298
VAE6	0.622	0.688	**0.785**	0.371	0.267	0.46	0.483	0.363
EI1	0.432	0.527	0.458	**0.839**	0.603	0.705	0.588	0.476

EI2	0.439	0.489	0.417	**0.900**	0.577	0.691	0.531	0.495
EI3	0.463	0.517	0.491	**0.879**	0.52	0.702	0.547	0.485
EI4	0.397	0.452	0.395	**0.858**	0.634	0.723	0.519	0.423
EI5	0.38	0.438	0.363	0.584	**0.902**	0.569	0.457	0.357
EI6	0.334	0.398	0.327	0.611	**0.926**	0.634	0.428	0.354
EI7	0.351	0.382	0.344	0.564	**0.867**	0.591	0.414	0.334
EI8	0.375	0.446	0.414	0.633	**0.887**	0.655	0.502	0.364
EI9	0.54	0.619	0.548	0.762	0.665	**0.910**	0.697	0.519
EI10	0.494	0.587	0.518	0.698	0.605	**0.911**	0.716	0.484
EI11	0.496	0.546	0.535	0.747	0.576	**0.916**	0.718	0.559
EI12	0.5	0.617	0.533	0.766	0.661	**0.931**	0.688	0.545
EI13	0.502	0.573	0.536	0.557	0.478	0.716	**0.889**	0.336
EI14	0.512	0.547	0.531	0.588	0.481	0.702	**0.892**	0.397
EI15	0.506	0.52	0.489	0.504	0.42	0.611	**0.874**	0.417
EI16	0.527	0.598	0.536	0.597	0.426	0.713	**0.915**	0.44
SE1	0.376	0.366	0.357	0.466	0.269	0.437	0.384	**0.824**
SE2	0.399	0.399	0.349	0.473	0.429	0.511	0.445	**0.786**
SE3	0.413	0.364	0.38	0.392	0.347	0.428	0.321	**0.739**
SE4	0.271	0.249	0.248	0.263	0.233	0.317	0.235	**0.559**
SE5	0.39	0.429	0.355	0.401	0.268	0.472	0.277	**0.742**
SE6(N)	0.348	0.315	0.33	0.428	0.23	0.397	0.34	**0.785**
SE7(N)	0.097	0.055	0.05	0.091	0.016	0.155	0.053	**0.452**

5.2.2 Second-order measurement model assessment

A high correlation between the first-order constructs—absorption, dedication, and vigor aspects of academic engagement and regulation of emotion, use of emotion, self-emotion appraisal and other emotion appraisal, and aspects of emotional intelligence—was discovered after the correlation statistics were computed using the PLS-SEM algorithm (see table 7). Consequently, the second-order construct for emotional intelligence and academic engagement was constructed based on the scores of the underlying first-order latent constructs (Hair, Matthews and Matthews, 2017). Notably, these categories are aspects of academic engagement and emotional intelligence, and we took into consideration the rules that (Jarvis, MacKenzie and Podsakoff, 2003) suggested when creating the SOC. Consequently, it reduces the complexity of the structural model while increasing parsimony (Hair, Ringle and Sarstedt, 2021).

Table 7 The correlations across constructs

Constructs	Absorption	Dedication	Vigor	Other Emotion Appraisal	Regulation of Emotion	Self-Emotion Appraisal	Use of Emotion
Absorption	1.000						
Dedication	0.818	1.000					
Vigor	0.766	0.789	1.000				
Other Emotion Appraisal	0.403	0.466	0.406	1.000			
Regulation of Emotion	0.573	0.627	0.586	0.505	1.000		
Self-Emotion Appraisal	0.499	0.573	0.509	0.669	0.630	1.000	
Use of Emotion	0.554	0.646	0.582	0.684	0.768	0.811	1.000

After FOC, the SOC measurement model was evaluated. First, we used factor loading, CR, rho_A and AVE to test the SOC's convergent validity. as shown in Table 8. The critical value of 0.708 is exceeded by the CR and CR values. The rho_A value (>0.708) is deemed satisfactory. The AVE value is higher than the 0.50 minimal criterion. This suggests that SOC's convergent validity and reliability criteria were satisfied. Second, we used the HTMT ratio and the cross-loading Fornell and Larcker criterion to test the discriminant validity of the SOC. The SOC indicators are different, as shown in Table 9, where AVE square root values are greater that the inter-construct correlations, confirming discriminant validity. Discriminant validity was present because the HTMT values were below the suggested maximum cut-off value of 0.85.

Table-8 The measurement model of Second order constructs

		Academic Engagement	Cronbach's alpha	(rho_a)	CR	AVE
Academic Engagement	**Absorption**	0.926	0.919	0.922	0.949	0.861
	Dedication	0.941				
	Vigor	0.916				
Emotional Intelligence	**Others Emotion Appraisal**	0.796	0.894	0.909	0.927	0.76
	Regulation of Emotion	0.844				
	Self Emotion Appraisal	0.896				
	Use of Emotion	0.945				

Table-9 Fornell & Larcker Criterion and HTMT ratio of SOC

Fornell-Larcker Criterion				
No.	**Construct**	**1**	**2**	**3**
1	Academic Engagement	0.928		
2	Emotional Intelligence	0.670	0.872	
3	Self Esteem	0.508	0.569	0.709
HTMT Ratio				
No.	**Construct**	**1**	**2**	**3**
1	Academic Engagement			
2	Emotional Intelligence	0.731		
3	Self Esteem	0.545	0.612	

Table 10 shows that the SOC indicators have stronger loadings on their own constructs compared to other constructs. Consequently, these findings demonstrated that the SOC has proven discriminant validity. The structural model of the study was examined after evaluating the measurement models for both FOC and SOC has been determined to be satisfactory (Hair *et al.*, 2019; Hair, Ringle and Sarstedt, 2021).

Table- 10 Cross Loadings of Second Order Construct

	Academic Engagement	**Emotional Intelligence**	**Self-Esteem**
Absorption	0.926	0.587	0.491
Dedication	0.941	0.669	0.474
Vigor	0.916	0.604	0.449
Others Emotion Appraisal	0.460	0.796	0.397
Regulation of Emotion	0.643	0.844	0.449
Self-Emotion Appraisal	0.570	0.896	0.543
Use of Emotion	0.642	0.945	0.576

5.3 Assessment of structural model

5.3.1. Hypotheses testing

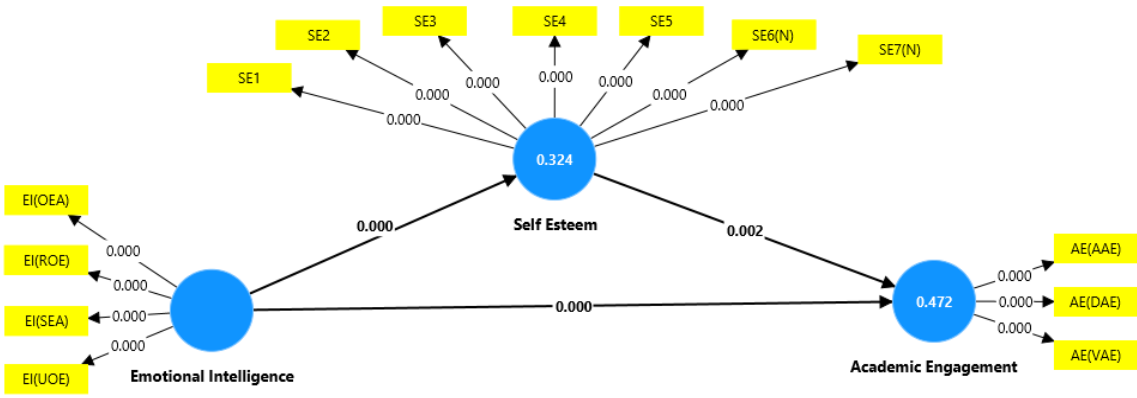
Following the guidelines of Hair *et al.* (2019), bootstrapping with 10,000 sub-samples (Ringle *et al.*, 2020) was conducted on the structural model to obtain p-values, t-values and Confidence Interval (CI) for testing the hypotheses. The results demonstrate that emotional intelligence significantly improves academic engagement (β-0.563, t-value 10.496, p-0.000) and self-esteem (β-0.570, t-value 10.146, p-0.000), as shown in Table 11 and Figure 3. Hypotheses H1 and H2 are therefore validated. Additionally, the findings show that academic engagement is directly and significantly impacted by self-esteem (β-0.187, t-value 3.073, p-0.002). Hypothesis H3 is thus validated. Additionally, the findings show that the association between academic engagement and

emotional intelligence is mediated by self-esteem (β-0.107, t-value 2.76, p-0.006). Hypotheses H4 are therefore validated.

Table-11 Structural Model's Outcomes

					CI		
Path	***Coefficient***	***SD***	***t-value***	***p-value***	***5%***	***95%***	***Inference***
EI->AE	0.563	0.051	10.496	0.000	0.453	0.664	H1 is Supported
EI->SE	0.569	0.056	10.146	0.000	0.447	0.667	H2 is Supported
SE->AE	0.187	0.061	3.073	0.002	0.06	0.301	H3 is Supported
EI->SE->AE	0.107	0.039	2.76	0.006	0.033	0.184	H4 is Supported

Figure-3 Structural model (PLS-SEM bootstrapping)



5.3.2 Mediating role of Self-Esteem

The information was analysed to determine whether the association between academic engagement and emotional intelligence is mediated by self-esteem (see Table 11 and Figure 3). Generally speaking, when partial mediation is present, the indirect association via a mediator is substantial and the direct association was observed between independent and dependent constructs. When there is full mediation, there is a statistically significant indirect relationship through the mediator but no statistically significant direct association between the independent and dependent constructs. Lastly, when the direct and indirect links are negligible, there is no mediation (Hair, Matthews and Matthews, 2017).

The findings in Table 11 show that self-esteem acts as a mediator in the association between academic engagement and emotional intelligence (β 0.563, t-value 2.76, p - 0.006). Thus, hypothesis H4 is supported. It can be concluded that self-esteem partially mediates the relationship between emotional intelligence and academic engagement because of the significant direct effect of emotional intelligence on academic engagement (β 0.563 p-0.000) and the significant effect of emotional intelligence on academic engagement through self-esteem (β 0.107, p-0.006) (see Table 12).

(Hair, Ringle and Sarstedt, 2021).

Table:12 Mediation test

Path	*Direct effect*		*Indirect effect*		*Decision*
	β	*p-value*	*β*	*p-value*	
EI->SE->AE	0.563	0.000	0.107	0.006	Partial Mediation

5.4.3 The explanatory power of the model

The explanatory capability of the model was assessed using the coefficient of determination(R^2). According to Rigdon, (2012), R^2 indicated the proportion of variance explained by the key dependent construct(s) (Shmueli and Koppius, 2011). The study's model has a moderate explanatory power, as shown by the R2 values for the endogenous components, academic engagement (0.472) and self-esteem (0.324), as shown in Table 13 (Henseler, Ringle and Sinkovics, 2009; Hair, Ringle and Sarstedt, 2011).

Table:13 The explanatory power of the model

Constructs	*R-square*	*R-square adjusted*
Academic Engagement	0.472	0.468
Self Esteem	0.324	0.321

6 Discussion

The current research aimed at examining the contribution of emotional intelligence and self-esteem in combining to affect academic engagement in college students. The results have shown that emotional intelligence positively influences academic engagement in a strong and direct manner. The more students are capable of perceiving, controlling, and exploiting their emotions, the more vigor, dedication, and absorption in their studies they will exhibit. This intuition is quite logical: emotionally intelligent people can better cope with academic stress and stay motivated despite failures, develop positive attitudes toward their peers and teachers, both factors that can aid in greater engagement with learning activities.

In addition to the immediate impact on engagement, emotional intelligence was also discovered to largely contribute to self-esteem. Emotionally competent students are in a better position to perceive their own emotions accurately, cope with difficulties and adaptively respond to social and academic events. Such positive experiences over time reinforce a positive self-image and a sense of personal value. Conversely, emotionally less intelligent students might have difficulties in emotional control, have higher rates of interpersonal problems and negative self-conceptions, which can undermine self-worth. Therefore, emotional intelligence is a skill base that can be utilized to develop and preserve positive self-esteem.

The research also established positive and direct predictability of self-esteem on academic engagement. Students with positive attitudes about themselves: students who feel they are competent, worthy, and respected tend to commit themselves to academic activities in a more complete manner. They are more likely to make higher goals, persevere more when they struggle and are more engaged in the classroom discussions and co-curricular activities. High self-esteem alleviates self-doubt and anxiety, liberating cognitive and emotional resources which could be used in learning. On the other hand, low self-esteem will cause disengagement, avoidance patterns, and lack of purpose in school.

Last, but definitely not the least, the study has shown that the relationship between emotional intelligence and academic engagement is mediated by self-esteem to some extent. This implies that emotional intelligence has two parallel effects on academic engagement. The former is direct: emotionally intelligent students get involved more

as they have emotional abilities to cope with the requirements of academic life. The second one is indirect: emotional intelligence initially increases self-esteem, and the latter improved self-worth, in turn, leads to a higher academic engagement. It is also worth noting the partiality of the mediation- this means that although self-esteem is a very critical mechanism, it is not alone. It is also likely that other factors, including academic self-efficacy, resilience, motivation or social support, are also important in converting emotional intelligence into active engagement. On the whole, these results indicate that there are two possible pathways: any intervention to increase student engagement must focus on improving both emotional skills and self-perceptions at the same time. Increasing emotional intelligence will bring about benefits, but the benefits will increase further when students are also taught to have a greater sense of self-worth. Schools that incorporate emotional intelligence training with self-esteem building activities like constructive feedback, goal setting activities, and experiences of mastery are most likely to experience the most significant changes in the level of engagement and consistency with academic work among the students.

7 Research implications

The results of this research have profound theoretical and practical implications to the educational psychology, curriculum development, and student development. Theoretically, the study is relevant to the growing body of research on positive psychology by providing empirical support that emotional intelligence can be a powerful, direct predictor of academic engagement in students in college. The study contributes to Self-Determination Theory by showing that self-esteem partially mediates this relationship and thus implies that emotionally intelligent students can more easily meet their fundamental psychological needs of competence and relatedness, which in turn leads to higher self-esteem and increased intrinsic motivation and academic interest. Moreover, the study emphasizes the context-specific character of these dynamics since the data were gathered in a particular group of students, which was located in Chandigarh, India. This implies that cultural and institutional variables could influence the relationships between emotional intelligence and self-esteem and academic engagement, thus, inviting the future theoretical studies to study these associations in various educational contexts. Practically, the findings provide practical suggestions to educators, policymakers and mental health experts. To begin with, institutions of higher learning ought to think about incorporating formal training on emotional intelligence in their curriculums. These programs, centered on self-awareness, emotional regulation, empathy and social skills, have the potential to equip students with the emotional skills that directly lead to creating vigor, commitment, and engagement with academic tasks. Second, since the self-esteem is a mediator, self-esteem enhancement workshops and counseling should also be introduced in universities and colleges. Creating positive self-perceptions in students can be an indirect yet a strong lever to their academic participation and persistence. Third, teacher training sessions should also involve the learning of strategies on how to establish supportive classroom settings that promote emotional intelligence as well as self-worth. The psychosocial interventions in conjunction with the traditional academic supports should be considered by policymakers who strive to minimize student disengagement and enhance academic performance. Lastly, the research suggests that academic engagement initiatives can also have a mental health impact since elevated emotional intelligence and self-esteem can lead to a general improvement in the mental health. In brief, the study bridges the psychological understanding with the practical aspect of education, which provides an integrated route towards student achievement.

8 Limitations of the study

Although this study has made significant contributions, the study has a number of limitations that should be taken into serious consideration when interpreting the study findings. The sample was limited to college students in the selected institutions in Chandigarh in India, first and foremost. This territorial and cultural peculiarity seriously restricts the overallizability of the findings. The relationships between emotional intelligence, self-esteem and academic involvement might be different in other cultures, socioeconomic and institutional policies, so the results cannot be directly generalized to students in other regions or levels of education. Second, the research was based solely on self-report measures. Although typical in psychological studies, self-report measures are susceptible to

response bias (e.g., social desirability), in which participants respond in a manner they believe to be desirable, or recall bias, in which subjects might not accurately recall their habitual attitudes or behavior. Such biases may overstate or misrepresent the relationships observed and jeopardize the internal validity of the inferences. Third, the study used a cross-sectional design, which gathered data at one time. This leaves no causal inferences. Though the proposed model assumes that emotional intelligence affects academic engagement via self-esteem, the opposite direction of the impact or mutual influences cannot be excluded. Experimental designs or longitudinal studies will be required to determine a true causality and time sequence of the variables. Fourth, the self-esteem mediation was not complete. This shows that there are other unmeasured variables that also contribute to the relationship between emotional intelligence and academic engagement. The model did not incorporation of potential mediators, including academic self-efficacy, resilience, motivation, or perceived social support. Their absence implies that future research has a fertile ground to be taken by filling the current explanation of the EI-engagement relationship. Lastly, there were certain measurement problems with the self-esteem scale. A number of items received factor loadings that were less than the suggested 0.707 and the average variance extracted of self-esteem was precisely 0.504, which is the minimum acceptable amount. This indicates that the self-esteem measure might not have been as reliable or valid with this sample and this could have compromised the accuracy of the mediation analysis. To support these findings, future research should implement other alternative or more culturally relevant measures of self-esteem.

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