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# The effect of academic emotion regulation on EFL learners' core of self-assessment and academic buoyancy: a structural equation modeling

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## Abstract

Students are essential parts of society, and their mental health and emotional safety as well as a sense of purpose, achievement, and success are the major objectives of successful education. They need to be armed with self-aid constructs to overcome academic setbacks and challenges. Despite the attributions of academic emotion regulation (AER), the core of self-assessment (CSA) to academic buoyancy (AB), no study has ever uncovered their relationships. To this end, the current research intended to test a structural model of English as a foreign language (EFL) university learners' AER, CSA, and AB. The academic emotion regulation questionnaire (AERQ), the core of self-assessment questionnaire (CSAQ), and the academic buoyancy scale (ABS) were administered to 395 Iranian EFL university learners. Based on the results of structural equation modeling (SEM), AER and CSA predict learners' AB. Additionally, the contribution of CSA to AB was confirmed. The implications of the findings are to raise learners' awareness of their personality traits and self-assessment that can foster practical learning and assessment. This study opens new doors for future academic research. The implications of the study may help learners, teachers, administrators, policymakers, and curriculum designers.

**Keywords:** Academic emotion regulation, The core of self-assessment, Academic buoyancy, EFL learners, Structural equation modeling

## Introduction

Emotions are an indispensable part of learning classes. Students should moderate and direct their emotions to ensure their academic success. Emotion regulation (ER) is a complex and dynamic process, which addresses various procedures applied for launching, hampering, or modulating individuals' position or performance (Gross, 1998a; Gross, 2015). AER acts similar to a compass and helps students to appraise and adjust the potency and persistence of their emotional experiences in educational contexts (Khajavy & Aghaee, 2022; Shafiee Rad & Jafarpour, 2022). The way and the

depth of ER affect all cognitive aspects of learning, and language learning is not an exception (Khajavy et al., 2020; Richards, 2020; Taylor false, 2020). Based on the significant role of AER in learners' emotional well-being and mental health, it seems necessary to explore how AER affects or is affected by other student-associated constructs.

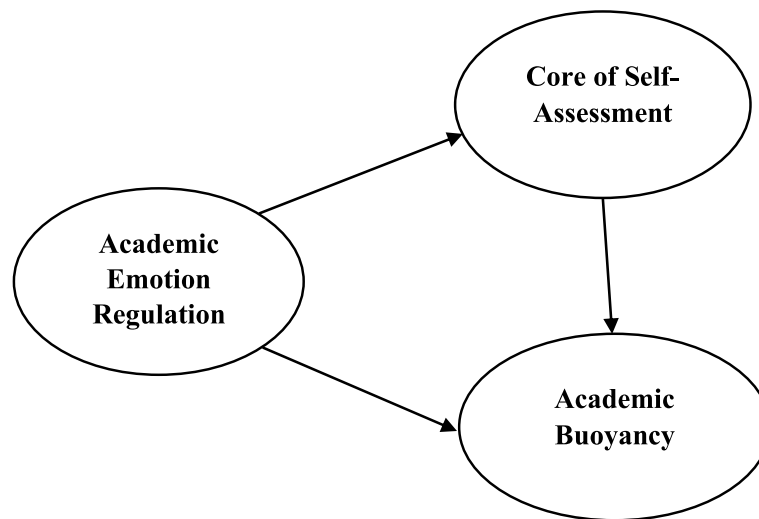
In an educational context, instruction and assessment are intertwined, and both of them influence the learning process. Therefore, reflecting and planning for effective instruction and assessment are the fundamental keys to education success. CSA is an integrated personality structure that reflects the learners' assessment and interpretation of their activities (GuoJie, 2021; Rahman et al., 2021). CSA affects the way students think about themselves and all the steps involved in their learning procedures (Tavousi & Pour Sales, 2018; Umeanowai & Lei, 2022). CSA opens up the mind of students to critically evaluate the ups and downs of education and decide skillfully (Miller Smedema false, 2015). Put it in other words, positive CSA endows positive perspectives toward education experiences and increases learners' involvement (Sifatu false, 2020). More specifically, positive CSA empowers learners to manage their emotional demands and maintain better social relationships with their peers as well as teachers (Wongdaeng, 2022; Zhuoyuan, 2021).

The other student-related construct considered in the current research is AB. The metaphor of AB refers to learners' qualities to skillfully cope with academic challenges and daily hassles (Yun false, 2018). AB is akin to a shield because it draws back learners' everyday stresses and anxiety (Martin, 2013, 2014). That is, sustainability, regularity adaptation, positive personal eligibility, and positive acceptance of academic life emerged help students to deal effectively with academic adversity and setback (Jahedizadeh false, 2019). Given that AB is a newborn concept, the factors that are salient in determining and improving AB are not completely under shadowed and calls for future research. Although the significant attributions of AER and CSA were approved in previous studies, to the best of researchers' knowledge, the relationship between AER, CSA, and AB has not been brought to the surface of research foci. Therefore, the dearth of research in this realm calls for more studies that portray a clear picture of their association. The outcome of this study can empirically and theoretically advance the related knowledge and research. In consideration of what was noted about the contributing role of AER, CSA, and AB, as well as the existing gaps, this study intended to propose a model to illustrate the effects of AER and CSA on AB (see Fig. 1). In this regard, the following research questions were raised:

- RQ1: How does EFL university learners' AER affect their CSA?
- RQ2: How does EFL university learners' CSA affect their AB?

According to these research questions, the following null hypotheses were formulated:

- H01: EFL university learners' AER does not affect their CSA.
- H02: EFL university learners' CSA does not affect their AB.



**Fig. 1** Theoretical-structural equation model

## Literature review

### *Academic emotion regulation (AER)*

The notion of emotion is generated from the Latin word “emovere,” meaning to stimulate (Hargreaves, 1998). It means that experienced emotions inspire people to behave and act in a specific direction. The existing literature offered a plethora of definitions for emotions. Different branches of study define and consider different aspects of emotions (e.g., physiology, philosophy, history, and sociology) (Khalil false, 2021; Oatley, 2000). These approaches, albeit derived from various theoretical conceptualizations, share this perspective that emotion is a multi-componential construct (e.g., Diefendorff false, 2008; Richards, 2020; Taylor false, 2020; Xiyun false, 2022). Emotions are perceived as short-lived and approximately intense constructs or trait-like manner and approximately stable in time (Abdollahi false, 2022; Gross et al., 2006; Rosenberg, 1998; Wood false, 2008). In this investigation, emotions are assumed at the trait level (the average frequency of emotions) to gauge EFL learners’ AER more deeply.

In this regard, education psychologists such as Sutton false (2009) asserted that the construct of emotion encapsulates appraisal, subjective experience, physiological change, emotional expressions, and action tendencies. In the same line of inquiry, a clinical psychologist, Izard (2010), utilized the terms antecedent cognitive appraisal, cognitive interpretation, neural systems, and expressive behavior to define the construct of emotion. From another perspective, Pawlak false (2022) characterized emotions as socially constructed, personally enacted ways of being that emerge from conscious and or unconscious judgments regarding perceived successes at attaining goals or maintaining standards or beliefs during transactions as part of social-historical contexts. Generally, the strategies involved in ER are defined in the process-oriented model of ER (Gross, 1998a). The five families of ER in this model are situation selection, situation modification, attention deployment, cognitive change, and response modulation. To address the processes of ER in an educational setting,

Burić false (2016) designed a model of AER that includes eight dimensions (i.e., situation selection, developing competencies, redirection attention, reappraisal, suppression, respiration, venting, and social support).

Emotion-related processes are different from affect, stress, and mood, but for years, they were used interchangeably (Dan-Glauser & Gross, 2013; Dwi Hastuti et al., 2022; Kolganov false, 2022). Affect is at the top of the hierarchy and encompasses both emotion and mood (Diefendorff false, 2008). The affective states may be (1) emotions like anger and sadness, (2) stress reactions to situations, and (3) moods such as depression and euphoria (Gross, 2014; Liu et al., 2022). Stress refers to negative affective responses, whereas emotion refers to both positive and negative affective status (Dan-Glauser & Gross, 2013). Emotions and moods are also different from each other. Moods influence cognition more than action (Siemer, 2001; Vadivel false, 2021). In addition, moods are more diffuse, although they may give rise to broad action tendencies such as approach or withdrawal (Lang, 1995). In contrast, emotions often last shorter than moods. Emotions are usually emerged from specific objects and give rise to behavioral response tendencies relevant to these objects (Gross, 2014; Jamali Kivi et al., 2021; Syairofi false, 2022).

ER refers to “a heterogeneous set of physiological, behavioral, and cognitive processes” (Gross & John, 2003, p.348) that people use to supervise their emotional demands. In other words, emotions are uncovered over time, and ER is a dynamic process that manages and modifies experienced emotions (Gross, 1998b; Heydarnejad false, 2021; Pekrun & Linnenbrink-Garcia, 2014). More precisely, Gross and Barrett (2011) considered ER as the stimulation of a regulatory objective, the engagement of regulatory mechanisms, and the alteration of the emotion trajectory as three main aspects of ER. Higher-order thinking skills (i.e., critical thinking and reflective thinking skills) and ER are closely related; they foster individuals’ productive immunity (Liu et al., 2022; Namaziandost false, 2022). It was also documented that ER and self-efficacy could contribute to L2 grit (Zheng false, 2022) and engagement (Deng false, 2022).

AER is defined as the strategies that students use to manage and modify their emotions in the academic context (Burić false, 2016). Research has shown that AER affects learners’ engagement, learning process, and academic success (Greenberg false, 2017; Morrish false, 2018; Pekrun false, 2017). Santos false (2021) documented that gender and age affect learners’ AER and academic engagement. In the same line of inquiry, Zheng and Zhou (2022) investigated the role of AER as well as cooperative learning on learners’ enjoyment in the EFL context. Their findings pinpointed the significant effects of AER, positive interdependence, and interpersonal support on enjoyment generation.

### **The core of self-assessment (CSA)**

Assessment, as an inevitable part of education, addresses the processes involved in collecting and interchanging information from related sources. The procedures and outcomes of an assessment provide an understanding of what the learners have learned and what they need to practice in the future (Bachman, 2015). Self-assessment is one category of assessment, which is defined as the “assessment or evaluation of oneself or one’s actions, attitudes, or performance. That is why each learner should be encouraged and trained to go through a process of self-assessment” (Bachman false, 2010, p. 12). Relevant to self-assessment, the notion of CSA is defined.

Self-regulated learning, monitoring, goal setting, and higher-order thinking skills are the key aspects of self-assessment (Andrade, 2019).

The CSA is an appraisal of one's competence and efficacy as a person (Locke false, 1996). According to Judge false (1997), the core of self-assessment is a kind of higher-order trait and includes four major aspects of self-esteem, generalized self-efficacy, neuroticism, and locus of control (Judge false, 1997). Self-esteem or self-respect addresses confidence in one's own worth or abilities (Judge false, 1997). Generalized self-efficacy refers to a person's belief and evaluation of their activities and the way they perform a particular task (Locke false, 1996). Neuroticism is a person's tendency to a negativistic cognitive/explanatory style of thinking (Watson, 2000). Locus of control, the last aspect of CSA, is concerned with a person's perception of the causes of events in a person's life (Judge false, 1997; Rezai false, 2022). CSA has intrinsic and extrinsic aspects (Bourke & Mentis, 2007). The extrinsic aspect of CSA is concerned with those external values, feedback from others, and grades. The intrinsic aspect of CSA is related to internal values and goal setting. It is worth highlighting that CSA is formulated and directed based on sociocultural settings as well as the learner's sense of self-determination and self-identity (Bourke & Mentis, 2007, 2013).

Every day, people face different challenges, and the way they decide and react in such situations may affect their academic and professional success. Al-Mamoory and Abathar Witwit (2021) noted that high levels of self-evaluation empower individuals to deal with problems and difficulties and try to do their best in their responsibilities. Learners with high levels of self-evaluation are enabled to manage and modify their emotional experiences (Hu, 2022; Putro false, 2022). A positive core of self-assessment arms students to evaluate their emotional experiences and direct them to improve their learning (Punpromthada false, 2022; Rouhollahi false, 2020; Snyder false, 2012). That is why the core of self-evaluations is considered a measure of emotional stability (Eysenck, 1990; Sutarto et al., 2022; Xu false, 2022).

Based on the existing literature, self-assessment is interrelated with self-efficacy beliefs (Namaziandost & Çakmak, 2020; Zheng false, 2022), academic emotion (Khajavy, 2021; Khajavy et al., 2020; Pekrun false, 2017; Pekrun & Linnenbrink-Garcia, 2014), metacognitive skills (Wei, 2020), critical thinking (Zhang, 2022), and reflective thinking (Davoudi & Heydarnejad, 2020). It was also documented that self-assessment guarantees the learners' well-being (Bijani false, 2022; Jahara false, 2022). To investigate the progress of the EFL learners, a study by Nemati false (2021) was conducted, and based on their results, self-assessment was the cause of cognitive and metacognitive enhancement among the learners. The mediator role coping styles on CSA and academic stress were examined by Jahara false (2022). Their findings reflected that a high level of coping style among EFL learners leads to positive self-assessment and the ability to manage academic stress. In a recent attempt, Heydarnejad false (2022) applied SEM to investigate the influence of L2 grit on CSA and anxiety about foreign language learning among EFL university students. They found that grittier learners are more successful in self-monitoring and evaluation. They could also manage and regulate their experienced anxiety in language classes.

### ***Academic buoyancy (AB)***

AB is a psychological construct that refers to students' capabilities to encounter everyday difficulties and challenges on the road of learning (Martin & Marsh, 2006; Martin & Marsh, 2008a; Yun false, 2018). AB and resilience are sometimes mixed, but they are actually different in terms of methodological and operational explanations. In this regard, Martin and Marsh stipulated that academic buoyancy is different from traditional resilience and related notions, which indicate everyday coping. Academic resilience refers to exhaustion and anxiety experienced due to failure and poor accomplishment, whereas AB is an experience of stress and pressure because of inappropriate performance in an educational context. Moreover, academic resilience is a clinical type of anxiety and frustration from academic context, while AB refers to low confidence, motivation, and engagement (Martin & Marsh, 2008b). Based on Jahedizadeh false (2019), AB is considered a requisite for academic resilience, but it is not an adequate condition. Therefore, AB is necessary for growing resilience and helping students in the face of challenges and life events (Martin & Marsh, 2006; Martin & Marsh, 2008b).

AB is stemmed from positive psychology (Xu & Wang, 2022). Positive psychology views that positive and self-aid attributes should be highlighted in the realm of language teaching and learning to accelerate their processes (MacIntyre & Gregersen, 2021). According to Gregersen (2013), positive psychology gives meaning to and supports language learning and teaching. Different instruments were introduced to assess the learners' AB. In a recent attempt, Jahedizadeh false (2019) designed and validated a context-specific instrument (i.e., EFL/ESL context) to assess AB more comprehensively. Their instrument entails 27 items in four subscales (i.e., sustainability, regularity adaptation, positive personal eligibility, and positive acceptance of academic life). Sustainability addresses the learners' capabilities to overpower their problems on the road of language learning. Regularity adaptation refers to language learners' abilities to set goals and adapt these goals to their personal values. Positive personal eligibility, as the second dimension of this instrument, considers learners' positive perceptions. The last dimension, positive acceptance of academic life, is related to the academic life of students and its effects on language learning procedures.

As the review of the existing literature suggests, studies on the realm of resilience in an educational context were quite rosy, but academic buoyancy is still uncharted and needs more attention. In their attempt, Malmberg false (2013) concluded that AB is associated with the difficulty in learning new things and judgments of personal competence. Furthermore, Miller Smedema false (2015), Martin (2014), and Yun false (2018) found that AB is influential on learners' academic achievement and their progress in English and mathematics learning. In another study, the interrelationships between antecedents of AB and emotional and physiological states were the focus of research (Phan & Ngu, 2014). As their outcomes suggested, cognitive processes of habitual action and critical reflection triggered learners' engagement and achievement. Taking a similar path, Zhang (2021) found that language teachers' buoyancy influences their learners' engagement. Thus, it can be inferred that buoyancy can help both teachers and learners, and investment in implementing useful strategies to increase the levels of AB is of great importance in every educational context. By applying structural equation modeling, Yang false (2022) explored the role of AB and self-efficacy in EFL students' L2 grit from Iran



and China. This study showed that high levels of AB and self-efficacy generate grit tendencies among learners. Additionally, Xu and Wang (2022) view that learners' AB can flourish, when they are motivated and interested. They also believe that teachers have a crucial effect in boosting their learners' AB.

## Method

This section displays the methodological steps involved in conducting the current study.

### Participants

The participants of this research were 395 university students studying different branches of English at the BA level in Iran. Among 395 participants, 181 students were studying English teaching, 89 English literature, and 125 were English translation. They were selected based on convenience or opportunity sampling procedures. They were 164 males and 231 females in the 18 to 26 age range.

### Instruments

#### *The academic emotion regulation questionnaire (AERQ)*

The AERQ developed and validated by Burić false (2016) was used to explore the EFL university students' AER. This instrument consists of 37 items on a 5-point Likert scale ranging from 1 "strongly disagree" to 5 "strongly agree." The subcomponents of AERQ are as follows: situation selection (4 items), developing competencies (5 items), redirection attention (6 items), reappraisal (5 items), suppression (5 items), respiration (3 items), venting (5 items), and social support (4 items). In this study, the reliability of AERQ measured by Cronbach's alpha (ranging from 0.847 to 0.908) was acceptable.

#### *The core of self-assessment questionnaire (CSAQ)*

To inspect the fundamental self-evaluation of EFL university students, CSAQ was utilized. This instrument was designed and validated by Judge false (2003) with 12 items on a 5-point Likert scale: strongly disagree (1), disagree (2), neutral (3), agree (4), and strongly agree (5). The range of scores in this instrument was from 12 to 60. High scores on this scale indicate students' positive self-evaluation, whereas low scores are considered negative self-evaluation. Based on the report of Cronbach's alpha ( $\alpha = 0.879$ ), the reliability of this instrument in our study was acceptable.

#### *The academic buoyancy scale (ABS)*

The participants' academic buoyancy was assessed via ABS and developed and validated by Jahedizadeh false (2019). Four dimensions of L2 buoyancy (sustainability, regularity adaptation, positive personal eligibility, and positive acceptance of academic life emerged) were evaluated by this instrument in 27 items. Furthermore, ABS is designed on a five-point Likert scale from 1 (definitely disagree) to 5 (definitely agree).

### Procedures

The data collection of this research was in April and ended in July 2022 and was conducted through a web-based platform. The participants were required to answer an electronic survey form involving the AERQ, the CSEQ, and the ABS via Google Forms. All

in all, 395 forms were received, and the return rate was 88.5%. The electronic surveys have the possibility of collecting data from different regions with varying age groups and sociocultural backgrounds. Additionally, the electronic survey can be designed in a way that all parts should be linked necessarily; therefore, no data are missed.

### Data analysis

At first, the normal distribution of the data was inspected through Kolmogorov-Smirnov test. As the data were normally distributed, parametric methods can be used. In this regard, CFA and SEM using LISREL 8.80 were employed to analyze the data. Based on Hair false (1998), CFA is used to validate the latent variables. After using CFA to validate the latent variables, SEM was employed. According to Schreiber false (2006), SEM is a robust multivariate procedure, and it is used to take a confirmatory hypothesis-testing approach for the proposed structural theory. SEM consists of two stages: the measurement model and the structural model (Kunnan, 1998). The aim of the measurement model is to explore the relationships between the observed variables and latent variables. The aim of the structural model is to examine the relationships between the latent variables.

### Results

In this section, the results of statistical analysis applied to delve into the association between AER, CSA, and AB are presented. Table 1 displays the descriptive statistics of EFL university learners' AER, CSA, and AB.

According to the report of descriptive statistics (Table 1), among the components of AER, redirection attention ( $M = 20.159$ ,  $SD = 5.635$ ) received the highest mean score, while respiration ( $M = 10.119$ ,  $SD = 2.866$ ) got the lowest mean score. Considering the components of AB, positive personal eligibility ( $M = 28.003$ ,  $SD = 7.019$ )

**Table 1** Descriptive statistics

Instruments	Subcomponents	N	Minimum	Maximum	Mean	Std. deviation
The academic emotion regulation questionnaire (AER)	Situation selection	395	4	20	12.906	4.345
	Developing competences	395	5	25	16.403	5.235
	Redirection attention	395	6	30	20.159	5.635
	Reappraisal	395	5	25	17.053	4.625
	Suppression	395	5	25	16.922	4.459
	Respiration	395	3	15	10.119	2.866
	Venting	395	5	25	17.843	4.652
The academic buoyancy scale (AB)	Social support	395	4	20	15.063	3.771
	Sustainability	395	7	35	23.314	6.211
	Regularity adaptation	395	4	20	13.494	4.183
	Positive personal eligibility	395	9	40	28.003	7.019
The core of self-assessment questionnaire (CSAQ)	Positive acceptance of academic life emerged	395	9	40	27.299	6.868
	CSA	395	13	60	40.749	10.050



**Table 2** The results of Kolmogorov-Smirnov test

Instrument	Subscales	Kolmogorov-Smirnov Z	Asymp. sig. (2 tailed)
AER	Situation selection	1.076	0.197
	Developing competences	0.973	0.300
	Redirection attention	0.617	0.841
	Reappraisal	1.084	0.190
	Suppression	1.097	0.180
	Respiration	1.143	0.147
	Venting	1.196	0.114
AB	Social support	1.217	0.104
	Sustainability	1.041	0.228
	Regularity adaptation	0.667	0.765
	Positive personal eligibility	0.537	0.936
CSA	Positive acceptance of academic life emerged	0.721	0.676
	CSA	0.905	0.386

**Table 3** Model fit indices

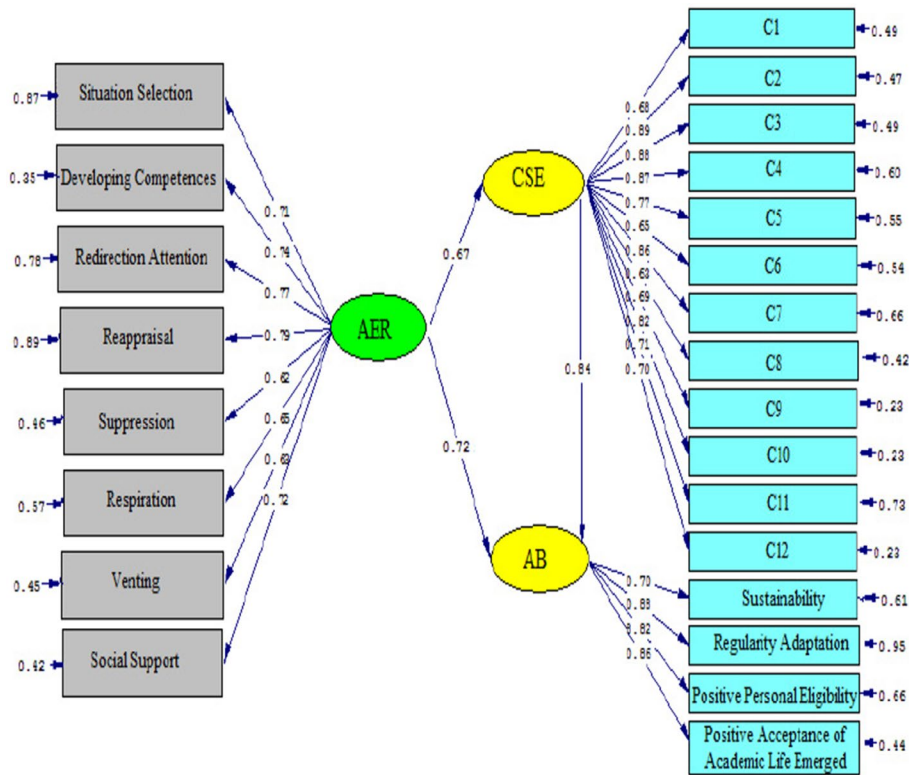
Fitting indexes			RMSEA	GFI	NFI	CFI	
Cut value		< 3	< 0.1	> 0.9	> 0.9	> 0.9	
The first model	713.57	249	2.866	0.069	0.915	0.922	0.931

was the highest mean score, and regularity adaptation ( $M = 13.494$ ,  $SD = 4.183$ ) was the lowest mean score endorsed by EFL learners. With regard to CSA, EFL learners got the following mean score:  $M = 40.749$ ,  $SD = 10.050$ .

To decide on using appropriate statistical methods in this study, the data distributions were inspected via the Kolmogorov-Smirnov test. The report of the Kolmogorov-Smirnov test is presented in Table 2.

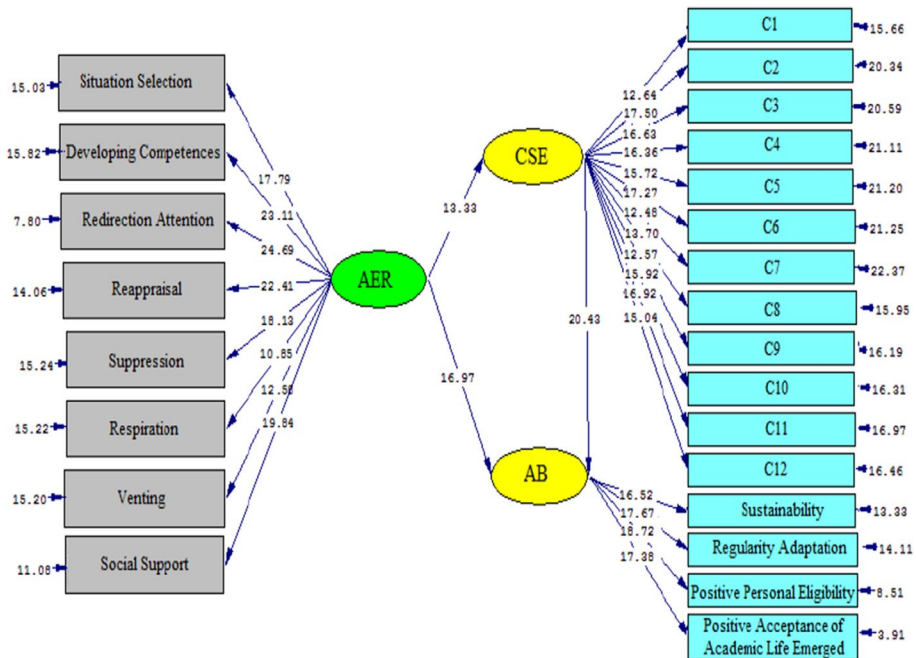
As Table 2 presents, the sig. values for all the instruments and their subscales were higher than 0.05, and the data were normally distributed. Thus, it can be concluded that using parametric methods to explore the related research hypotheses is logical. In so doing, the LISREL 8.80 statistical package was used to examine the structural relationships among AER, AB, and CSA. To measure the model fit, the chi-square magnitude, the root-mean-square error of approximation (RMSEA), the comparative fit index (CFI), and the normed fit index (NFI) were employed. As Jöreskog (1990) stipulated, the chi-square/df ratio should be lower than 3, and the chi-square should be non-significant. Furthermore, the root-mean-square error of approximation (RMSEA) is suggested to be lower than 0.1 (Jöreskog, 1990). The cut values for the NFI, GFI, and CFI are suggested to be greater than 0.90 (Jöreskog, 1990).

According to Table 3, the chi-square/df ratio (2.866) and the RMSEA (0.069) were acceptable. The other three fit indices, GFI (0.915), NFI (0.922), and CFI (0.931), reached the acceptable fit thresholds.



Chi-Square=713.57, df=249, P-value=0.00000, RMSEA=0.069

**Fig. 2** Schematic representation of path coefficient values for the relationships between AER, CSA, and AB (model 1)

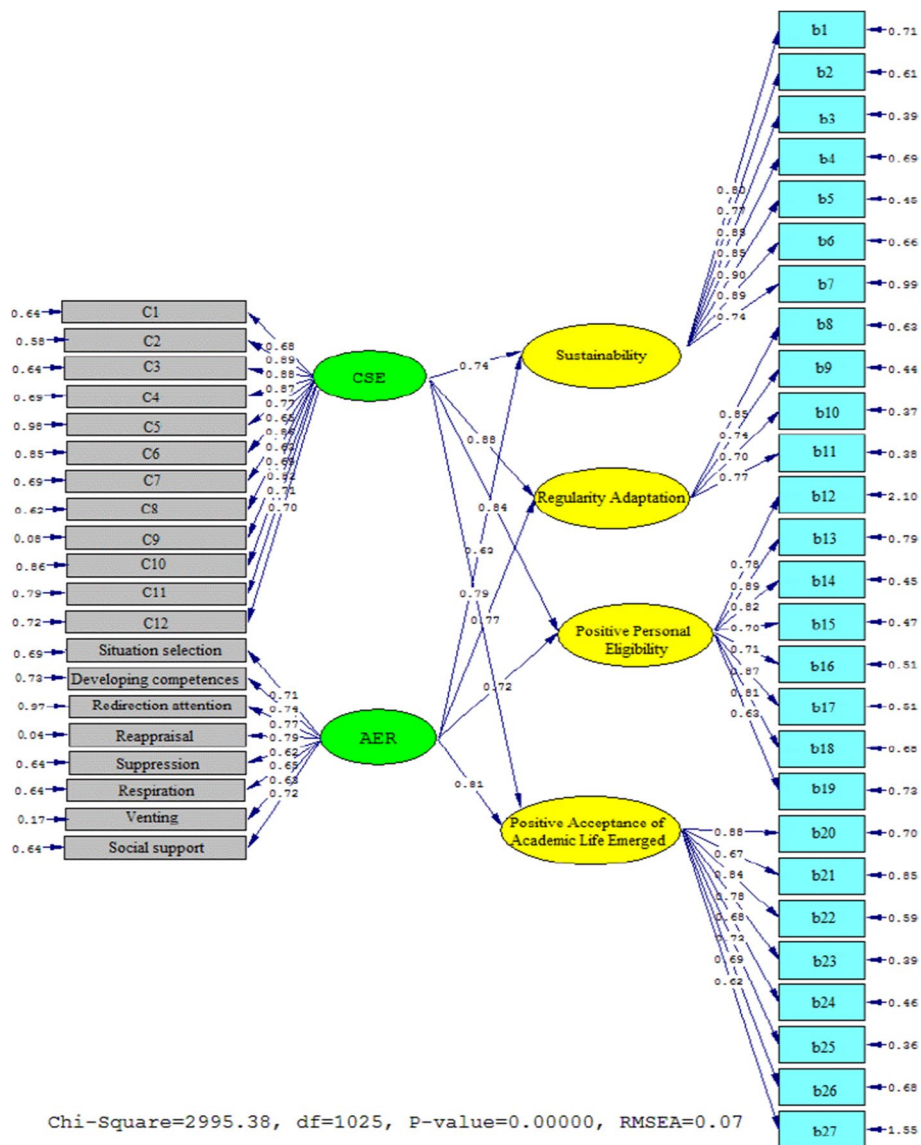


Chi-Square=713.57, df=249, P-value=0.00000, RMSEA=0.069

**Fig. 3** T-values for path coefficient significance (model 1)

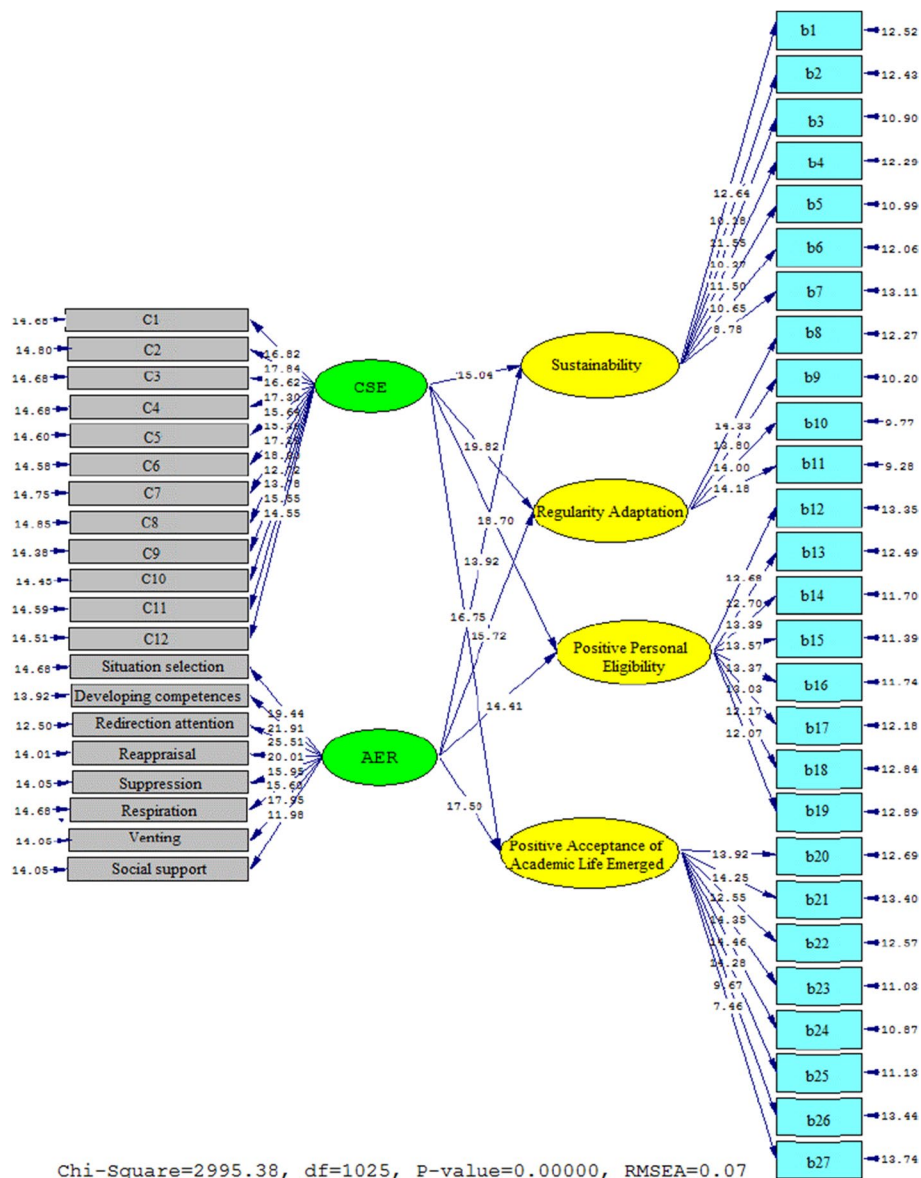
**Table 4** Model fit indices

Fitting indexes				RMSEA	GFI	NFI	CFI
Cut value			< 3	< 0.1	> 0.9	> 0.9	> 0.9
The second model	2995.38	1025	2.922	0.07	0.938	0.944	0.954



**Fig. 4** Schematic representation of path coefficient values for the relationships between AER, CSA, and AB subscales (model 2)

The *t*-values and standardized estimates were investigated to scan the strengths of the causal relationships among the variables. Figures 2 and 3 show that the influence of AER on CSA ( $\beta = 0.67, t = 13.33$ ) and AB ( $\beta = 0.72, t = 16.97$ ) was significantly positive (the *t*-value was greater than 1.96). Moreover, the influence of CSA on AB was significant and in a positive direction ( $\beta = 0.84, t = 20.43$ ), and the *t*-value was greater than 1.96.



**Fig. 5** T-values for path coefficient significance (model 2)

The following table (Table 4) displays the fit indices proposed in the second model, which were acceptable. The chi-square/df ratio (2.922) and the RMSEA (0.07) presented the acceptable fit thresholds. In addition, GFI (0.938), NFI (0.944), and CFI (0.954) were acceptable.

The schematic representation of path coefficient values for the relationships between AER, CSA, and AB subscales are depicted in Figs. 4 and 5 (model 2). As these figures show, AER significantly and in a positive direction is related to sustainability ( $\beta = 0.63$ ,  $t = 13.92$ ), regularity adaptation ( $\beta = 0.77$ ,  $t = 15.72$ ), positive personal eligibility ( $\beta = 0.72$ ,  $t = 14.41$ ), and positive acceptance of academic life emerged ( $\beta = 0.81$ ,  $t = 17.5$ ). Similar statistically significant and positive relationships were found between CSE and AB subscales as follows: sustainability ( $\beta = 0.74$ ,  $t = 15.04$ ), regularity adaptation ( $\beta =$

**Table 5** The correlation coefficients between AER, CSA, and AB subscales

	AER	CSA	Sustainability	Regularity adaptation	Positive personal eligibility	Positive acceptance of academic life emerged
AER	1					
CSA	0.699**	1				
Sustainability	0.655**	0.769**	1			
Regularity adaptation	0.794**	0.891**	0.704**	1		
Positive personal eligibility	0.748**	0.867**	0.618**	0.609**	1	
Positive acceptance of academic life emerged	0.856**	0.821**	0.655**	0.703**	0.598**	1

\*\* Correlation is significant at the 0.01 level (2 -tailed)

0.88,  $t = 19.82$ ), positive personal eligibility ( $\beta = 0.84$ ,  $t = 18.70$ ), and positive acceptance of academic life emerged ( $\beta = 0.79$ ,  $t = 16.75$ ).

Furthermore, a Pearson product-moment correlation was conducted to gauge the correlation between AER, CSA, and AB subscales.

According to Table 5, the correlations between AER and AB subscales were statistically significant. That is, AER and sustainability ( $r = 0.655$ ,  $p < 0.01$ ), regularity adaptation ( $r = 0.794$ ,  $p < 0.01$ ), positive personal eligibility ( $r = 0.748$ ,  $p < 0.01$ ), and positive acceptance of academic life emerged ( $r = 0.856$ ,  $p < 0.01$ ) were significantly and positively connected. Regarding the relationships between CSA and AB subscales, Table 5 displays positive and statistically significant correlations such as the following: sustainability ( $r = 0.769$ ,  $p < 0.01$ ), regularity adaptation ( $r = 0.891$ ,  $p < 0.01$ ), positive personal eligibility ( $r = 0.867$ ,  $p < 0.01$ ), and positive acceptance of academic life emerged ( $r = 0.821$ ,  $p < 0.01$ ).

### Discussion

This investigation was an attempt to unveil the relationship between AER, CSA, and AB among EFL university students. To achieve this aim, a structural equation modeling approach was utilized to propose and build a causal structural model of the association between these constructs. Based on the findings and what model 1 as well as model 2 portray, AER and CSA play a mediator role in boosting AB. Additionally, the impact of CSA on AB was concluded (model 1). Thereby, it can be inferred that AER and CSA can predict AB (model 1 and model 2). Therefore, the first null hypothesis (H01: EFL university learners’ AER does not affect their CSA) and the second null hypothesis (H02: EFL university learners’ CSA does not affect their AB) were rejected.

As the findings of the first research question suggest (how does EFL university learners’ AER affect their CSA?), high levels of AER among the learners can predict high levels of CSA. It means that the strategies involved in AER (i.e., situation selection, developing competencies, redirection attention, reappraisal, suppression, respiration, venting, and social support) provide a balance in the educational lives of the students, which helps them to critically evaluate their learning procedure. As it was discussed before, the process involved in CSA is originated from self-determination and self-identity theories (Bourke & Mentis, 2007, 2013). Based on this result, the emotional balance

of the learners positively affects their identity and attitudes toward monitoring and metacognitive skills. This finding can be discussed from another perspective. As it was documented, emotion and cognition are interrelated (Li false, 2022), and the success of individuals depends on the balance that is provided on each of these poles (emotion and cognition). When students in general and university students, in particular, are emotionally supported and they use suitable strategies in the face of chaos and complexities, they can cognitively and metacognitively change their educational lives for the better. Self-assessment empowers students to appraise and change from the inside; the study findings show that high levels of CSA cannot be achieved without AER.

As the literature on AER and CSA reflected, the possible relationship between AER and CSA was completely under shadow, and to date, no empirical or theoretical studies have been administered in this regard. As the subcomponents of AER indicate, CSA can be adjusted by using situation selection, developing competencies, redirection attention, reappraisal, suppression, respiration, venting, and social support to regulate emotions. These strategies are directly and indirectly connected with other self-aid constructs, which were documented to be related to AER as well as CSA. In their study, Shafiee Rad and Jafarpour (2022) concluded that EFL learners' ER and L2 grit influence their resilience. Huang (2022) evidenced that self-assessment is critical in EFL teachers' self-regulation and self-efficacy. In another context, Peistaraite and Clark (2020) found out emotion regulation fosters self-regulated learning in classical musicians. Taking a similar path, Gorjinpour and Barzegar (2022) set forth a study to examine the usefulness of self-efficacy training on students' emotional cognitive adjustment and stress management. Their outcomes indicated that implementing self-efficacy in training programs supported effective cognitive emotion regulation strategies and decreased students' stress.

The second research question (how does EFL university learners' CSA affect their AB?) addressed the relationships between CSA and AB (model 1 & model 2). It means that a high level of CSA is a significant predictor of AB. This finding can be supported by the underpinning disciplines and areas of positive psychology. It implies that CSA maximizes the benefits of AB among EFL university students. In addition, a statistically significant and positive correlation between CSA and the subcomponents of AB was confirmed. The more students engaged in their self-assessment, the better they can improve sustainability, regularity adaptation, positive personal eligibility, and positive acceptance of academic life emerged. Regarding this outcome, this rationale could put forward that buoyant students should be armed with cognitive and metacognitive attributes to help them sustain in all educational events and be active in learning. While students in higher education may experience more anxiety and stress due to their age and challenges about their future jobs and lives, CSA and AB will help them a lot to stay in balance and decide thoughtfully. Considering AB, Middleton false (2020) asserted that effective assessment feedback can attribute learners' AB. Moreover, Esmailzade Ashini false (2020) highlighted the reciprocal association between AB, engagement, and students' self-efficacy. As it was discussed before, self-efficacy is regarded as an indispensable part of AB. Therefore, it can be concluded that higher levels of self-efficacy beliefs lead to higher levels of AB.



As a further outcome, this study found that AER could contribute to AB (model 1). The results showed that AER could change AB among EFL university students. In other words, buoyant students applied efficient strategies to govern and regulate their emotional experiences. It means AER is a critical step toward sustainability, regularity adaptation, positive personal eligibility, and positive acceptance of academic life emerged among university students. The relationship between AER and AB was quite unexplored. The findings of Hirvonen *et al.* (2019) indirectly supported this study findings. According to their results, AB and emotions were related to each other, and they could contribute to learners' academic expectations and behaviors. In the same line of inquiry, Azarian *et al.* (2020) evidence that AB and emotion regulating training are the cause of learners' academic meaning and academic adjustment. The role of AB was also studied from the lens of social support in higher education by Jia and Cheng (2022). This study indicated that AB and social support are integrated, and both of them supported EFL university learners' motivation. Thus, buoyant students are more engaged in social activities; they have high levels of motivation.

### **Conclusion and implications**

The present research was the first endeavor to display the interplay between AER, CSA, and AB. The results of structural equation modeling confirmed that AER and CSA could predict learners' AB. Moreover, the contribution of CSA to AB was concluded. The direction of their association was found to be statistically significant and positive. Thus, it can be concluded that students who are able to regulate their emotions can assess their activities and learning procedures. They are more engaged and active learners. Students armed with positive regulatory strategies use are able to use the lens of self-assessment to zoom in on every aspect of their learning. In such a situation, the students feel more responsibility and autonomy for their learning, and they are in search of sustainability, regularity adaptation, positive personal eligibility, and positive acceptance of academic life.

The findings of the current investigation offer some pedagogical implications for learners, language instructors, university professors, teacher educators, curriculum designers, and material developers. Considering the efficient role of AER and CSA in fostering AB, training programs are needed for learners to learn how they can achieve and boost these learner attributes (i.e., AER, CSE, & AB). In so doing, teachers and university professors need some training courses to become aware of the advantages of implementing AER, CSA, and AB as part of their teaching plan. Through these training courses, they should learn how they can implement and practice AER, CSE, and AB in their classes. This awareness is also crucial for learners, especially students in higher education. They should learn how to manage their emotions, evaluate themselves, and boost their academic buoyancy. The syllabus of the class can be designed in a way that directly or indirectly learners practice self-aid constructs beside the academic texts to ensure the well-being of the learners and, in consequence, the well-being of society. Implementing self-assessment rather than teacher assessment is also highlighted to promote learning and achievements. Additionally, material developers and assessment designers are suggested to include these constructive constructs among the academic texts and emphasize their practicing through tasks and tests.



This research similar to other studies suffers from some limitations. It was restricted to the learners' experiences in educational contexts. Future research may compare and contrast learners' achievement with regard to their regulation and assessment of their emotions and performance in their personal lives. Furthermore, this study was quantitative in nature. In the future, qualitative or mixed-method approaches can explore the relationships between AER, CSA, and AB. The possible effect of demographic variables on the learners AER, CSA, and AB was untouched in this study. Future research can address this part and explore the possible variations in this regard. Our study was also limited in its procedures of data collection. Due to practical constraints, convenience sampling or opportunity sampling procedures were utilized. To ensure generalizability, other sampling procedures are suggested in future research. As it was discussed, research in the realm of AER, CSA, and AB is entirely in its infancy. Thus, exploring the influence of AER, CSA, and AB on other learner-related constructs can be recommended as further research agenda in the future.

#### Abbreviations

EFL	English as a foreign language
ESL	English as a second language
ER	Emotion regulation
AER	Academic emotion regulation
CSA	Core of self-assessment
AB	Academic buoyancy
AERQ	Academic emotion regulation questionnaire
CSAQ	Core of self-assessment questionnaire
ABS	Academic buoyancy scale
SEM	Structural equation modeling

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#### Authors' contributions

All authors have made substantial contributions to conception and design, acquisition of data, analysis and interpretation of data, and writing the manuscript. The authors read and approved the final manuscript.

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#### Availability of data and materials

The authors state that the data supporting the findings of this study are available within the article.

#### Declarations

##### Competing interests

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