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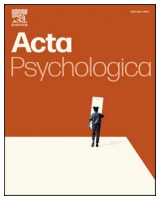
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Exploring the relationship between burnout, learning engagement and academic self-efficacy among EFL learners: A structural equation modeling analysis

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ABSTRACT

This study examined the role of learning engagement and academic self-efficacy in the feelings of burnout among English as a foreign language (EFL) students from China ($N = 197$). Three closed-ended scales were employed in the quantitative phase of this study to explore the relationship between the latent variables. Additionally, a hypothetical model was created and verified using Pearson's correlation analysis, structural equation modeling (SEM), path analysis, and mediating effect test. The investigation results demonstrated that while learning engagement was positively correlated with medium levels of academic self-efficacy, student burnout was inversely correlated with both variables. Among Chinese EFL students, academic self-efficacy and learning engagement are predictive of burnout, and learning engagement can act as a mediator to reduce the impact of academic self-efficacy on burnout. The implications for EFL teaching and learning are discussed in light of those findings, including enhancing EFL students' self-efficacy to reduce pessimism and increase academic achievement.

1. Introduction

Emotions are a significant factor influencing language learning (Dewaele & MacIntyre, 2014; Krashen, 1985; MacIntyre & Gregersen, 2012). In recent years, the field of second language acquisition (SLA) has been influenced by Positive Psychology (PP) (Dewaele et al., 2019). It has been suggested that positive and negative emotions need to be investigated together to gain a better understanding of their mechanisms and influencing factors (e.g., Derakhshan et al., 2022; Dewaele & Li, 2021; Dewaele & MacIntyre, 2014). Academic self-efficacy, conceptualized as the confidence in coping with academic demands and challenges (Mulyadi et al., 2016), is an essential factor in the learning process. The control-value theory (Pekrun, 2006) argues that academic emotions mutually influence the learning process, affecting academic performance. In the present study, it is hypothesized that academic self-efficacy and learning engagement make a significant difference in English as a foreign language (EFL) learners and contribute to diminishing their academic burnout.

Recently, academic burnout, as a negative state in SLA, has been discussed in terms of its constructive framework, scale development, research, and influences (Derakhshan et al., 2022; Li et al., 2021). Those studies seem to agree that positive teacher-student relationships and interactions play a role in predicting student burnout, which, in turn, affects students' academic performance. Yet, to the best of our knowledge, few studies about student burnout in EFL contexts exist. Derakhshan et al. (2022), for example, reported a medium level of Chinese EFL learners' burnout. According to Karimi and Fallah (2019), an individual's shame and intrinsic motivation functioned as a direct factor influencing EFL learners' burnout. Given that emotions could have distinct conceptual structures depending on the situation (Li et al., 2021), it is crucial to explore burnout in Chinese EFL learners in the process of second/foreign language (L2) learning to understand whether studies produced in other populations may apply to Chinese students who face peculiar challenges in learning English.

Learning engagement is a priority component in understanding learning behaviors as it positively contributes to students' academic performance in areas that encompass but are not limited to, academic accomplishments, emotional regulation, visual memory, and more (Schaufeli et al., 2002; Shi et al., 2022; Stan et al., 2022). More engaged EFL students typically have access to superior personal resources,

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leading to better academic achievements (Wang & Kruk, 2024). Learning engagement has been considered a vital component of the learning process that affects the outcome of EFL education (Amiryousefi, 2019; Dewaele & Li, 2021). Likewise, academic self-efficacy (ASE) is a crucial regulator in teaching and learning in the EFL environment. ASE focuses on EFL learners' perceptions of their abilities, goal attainment, and confidence in achieving their learning goals (Bandura, 1977). The microcosm of EFL affects students' academic self-efficacy, and the level of self-efficacy may, in turn, influence their academic emotions and consequently affect the academic achievements of EFL learners (Li et al., 2020). Therefore, exploring the relationship between academic self-efficacy, student burnout, and learning engagement among Chinese EFL learners will contribute to understanding learners' academic emotions induced by individual differences and enhance pedagogies for EFL teachers.

Although there are studies exploring the relationship between the three latent variables mentioned above, in light of the control-value theory (Pekrun, 2006), how learning engagement and self-efficacy affect EFL students' burnout and how EFL students respond to it remain under-investigated topics (Charkhabi et al., 2013). To bridge this gap, the current study adopts quantitative analysis, aiming to explore the mediating role that learning engagement plays in the relationship between academic self-efficacy and student burnout among Chinese EFL learners.

2. Literature review

2.1. Student burnout

Freudenberger (1974) was the first researcher to describe burnout symptoms in the field of psychology. As researchers in psychology and education continued to explore the topic, burnout was increasingly applied to investigating learner-related states (Schaufeli et al., 2002). Early burnout refers to the depletion of learners' energy due to prolonged classroom stress, a gradual loss of enthusiasm for group activities, indifference to classmates and their behaviors, and negative attitudes toward learning activities stemming from unsatisfactory academic performance (Meier & Schmeck, 1985). These characteristics are summarised in three dimensions: exhaustion, cynicism and inefficacy/reduced efficacy (Li et al., 2021; Zhang et al., 2007). Based on Schaufeli and Salanova (2007), exhaustion represents "the draining of emotional resources", cynicism refers to "depersonalization", which means negative attitudes toward other people, and inefficacy indicates the feeling of "incompetence and underachievement" (pp. 177–178).

In foreign language teaching, burnout has been investigated among both EFL teachers and learners (Derakhshan et al., 2022; Leaver et al., 2005; Li, 2023; Smith & Renzulli, 1984). Research on burnout in the field of foreign language learning is still in its infancy, focusing on conceptual definitions, research instruments, the design and refinement of scales (Li et al., 2021), while other studies pay attention to the impact of various internal and external factors in foreign language learning environments, such as the predictive role of teacher immediacy and stroke behaviors (Derakhshan et al., 2022), and mindfulness and self-perceived proficiency (Gao, 2023). To give a few examples, using *Maslach Burnout Inventory-Student Survey* (MBI-SS) as a basis, Li et al. (2021) conducted a localization of the MBI-SS, validated it in a foreign language context, and finally developed a 10-item inventory specifically tailored to Chinese students. Madigan & Curran, 2020) collated a variety of variables moderating the relationship between burnout and academic achievement, synthesizing the results of 29 empirical studies in a meta-analysis ($N = 109{,}396$), which revealed that the three elements underpinning burnout, i.e., exhaustion, cynicism, and inefficacy were all negatively correlated to some degree with academic achievement. Derakhshan et al. (2022) concentrated on the impact of teacher immediacy and teacher stroke on Iranian students' academic burnout ($N = 631$). The study showed that both teacher immediacy and stroke were significant predictors of academic burnout ($\beta = -0.20, -0.27, p < .05$), following which they suggested building a cordial and positive teacher-student relationship.

2.2. Learning engagement

The term "engagement" was defined as "a positive, fulfilling, work-related state of mind characterized by vigor, dedication, and absorption" (Schaufeli et al., 2002, p. 465). On the same note, learning engagement is a persistent, positive emotional and cognitive psychological state associated with, for example, academics and research. Vigor is conceptualized as a high level of mindfulness, energy, and mental resilience during the learning process; dedication is the state of being highly invested in learning, including a sense of meaning, inspiration, and enthusiasm; absorption represents the degree to which a person is fully engaged in learning (Wang et al., 2022).

From the perspective of positive psychology, with vigor, dedication, and absorption as the main dimensions, learning engagement is one of the most valuable indicators of a state of well-being in students, which can stimulate motivational qualities and thus have a favorable impact on students' academic achievements (García-Martínez et al., 2021; Loscalzo & Giannini, 2018; Tinto, 2017; Truta et al., 2018). In the context of EFL learning process, learners' engagement is often influenced by factors such as teacher-student interaction (Wang & Derakhshan, 2023), emotional intelligence (Zhen et al., 2017), and self-regulation strategies (Al Mamun & Lawrie, 2023), as well as learners' ability to adapt to uncertainty and perceived pressure during the online learning process (Stan et al., 2022). With 474 college students as the study population, Wang et al. (2022) examined the correlation between different dimensions of learning interactions and learning engagement through structural equation modeling (SEM). They investigated the effects of school-related mood and self-efficacy as mediators on participation in the online learning environment. Pan et al. (2023) explored the extent to which English teachers' affective scaffolding influences Chinese EFL students' engagement in learning. Results suggested that constructing conducive teacher-student relationships is the key to boosting EFL learners' psycho-emotional development. Typically, the more academically engaged students are, the more prepared they are to concentrate on learning tasks for extended periods and are motivated to pursue learning opportunities to further their comprehension.

2.3. Academic self-efficacy

According to Bandura (1986, 1977), self-efficacy is an individual's judgment of the effectiveness of their interactions with their academic environment. Self-efficacy determines whether an individual will trigger a counter strategy, how much effort he or she will exert, and how long he or she will persist despite setbacks and negative experiences (Bandura, 1977). Namely, self-efficacy is essential to prepare an individual to engage in positive behaviors, overcome adversity, adapt to it, and thus achieve a better self. The triadic framework of self-efficacy encompasses perceptions of competence (the individuals' beliefs and confidence in their ability to achieve competence and goal attainment), perceptions of behavior (the individuals' ability to control their behaviors to achieve their goals), and perceptions of the environment (the individuals' capability to make use of their surroundings). Teacher self-efficacy has been the subject of extensive research across academic disciplines (e.g., Dewaele & Leung, 2022; Wang & Pan, 2023). Academic self-efficacy, as its name implies, refers to a sense of self-efficacy related to academic tasks and performance, characterized by a learner's confidence in achieving academic success (Bong & Skaalvik, 2003; Li et al., 2020).

As for social psychology, positive psychology, and second language acquisition, the influence of academic self-efficacy cannot be underestimated. Research has indicated that academic self-efficacy influences academic achievement (Caprara et al., 2011), academic stress (Mulyadi et al., 2016), academic hardiness (Cheng et al., 2019), and postgraduate

procrastination (Liu et al., 2020). Wang et al. (2022) verified the mediating role of e-learning efficacy in the relationship between interaction and learning engagement through SEM, shedding light on the internal impact of interaction on learning engagement. In the EFL context in China, research has focused more on teacher self-efficacy than on student self-efficacy (e.g., Han & Wang, 2021; Orakcı et al., 2023; Yang, 2021). Thus, it is imperative to explore the relationship between academic self-efficacy and academic emotions among Chinese EFL learners.

2.4. Control-value theory and the present study

According to the control-value theory (Pekrun, 2006), academic emotions are influenced by individual validity (one's positive or negative emotions generated by an activity), activeness (task and environment during the activity process), and performance assessment (evaluation of the activity or its outcomes). Pekrun (2006) argued that academic emotions, learning processes and academic achievement have a bi-directional and dynamic relationship, which means that these variables may predict each other. The current study is dedicated to exploring the relationship among Chinese EFL learners' academic self-efficacy, learning engagement, and learning burnout based on the control-value theory. Wang and Pan (2023) claimed that teacher's self-efficacy can serve as a predictor of teacher engagement, as demonstrated through SEM. Taking this into account, in theory, we can assume that learners' academic self-efficacy can influence their learning engagement and thus affect learning burnout, and we aim to build a hypothetical model based on the following research questions (RQ) (see Fig. 1).

RQ1: Does EFL learners' learning engagement have any significant impact on their burnout?

RQ2: Does EFL learners' academic self-efficacy have any significant impact on their burnout?

RQ3: Can learning engagement function as a mediator of academic self-efficacy affecting student burnout?

3. Methodology

3.1. Participants

Based on convenience sampling, this study investigated 197 cases of EFL students' learning burnout, learning engagement, and academic self-efficacy through Wenjuanxing, a professional online questionnaire survey platform in China. This platform provides Chinese researchers with a wide range of questionnaire requirements, such as questionnaire surveys, online exams, online assessments, and online polls. The population was comprised of undergraduate students majoring in English language and literature, computer science, as well as ecology, and postgraduate students learning English translation and interpreting, and engineering. The participants (45.9 % male, 54.1 % female) ranged in age from 19 to 28 years, with a mean age of 21.95 ($SD = 1.622$). The participants were selected from a variety of Chinese universities in order to maximize the generalizability of the study's findings to Chinese EFL learners.

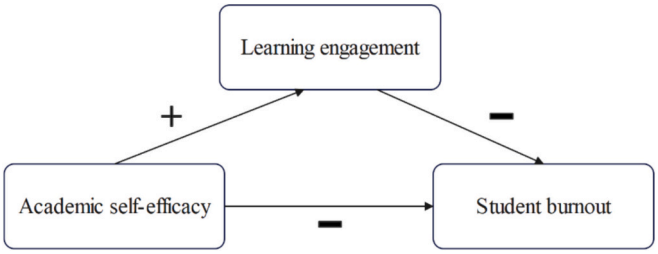


Fig. 1. The hypothesized model.

3.2. Measures

3.2.1. Student burnout

The present study uses the scale constructed and validated by Li et al. (2021) for the Chinese population to measure burnout, based on Schaufeli et al.'s (2002) conceptualization of burnout and the related Maslach Burnout Inventory-Student Survey (MBI-SS). The scale proposed by Li et al. (2021) introduced "reduced efficacy" as a new dimension in place of "efficacy", overcoming the problem of low internal reliability among Chinese subjects and achieving high validity. After deleting the five original low-factor loading question items of the MBI-SS, Li et al.'s (2021) scale passed the tests of construct and convergent validity, and the results demonstrated that the model fit was excellent. The present study was conducted in China to measure university students' burnout in the English learning context, which is in line with the scope of applicability of Li et al.'s scale (2021). Thus, the scale was used rather than the general MBI-SS (Schaufeli et al., 2002). The scale included items such as "I feel emotionally drained by my English studies", "I have become less enthusiastic about my English studies", and "I believe that I don't make an effective contribution to the English classes that I attend". Participants were required to choose among 1 = strongly disagree, 2 = disagree, 3 = neither agree nor disagree, 4 = agree, and 5 = strongly agree.

3.2.2. Learning engagement

Data on the subjects' learning engagement level were collected using the *Learning Engagement Scale* (Schaufeli et al., 2002). The *Learning Engagement Scale* has been validated for Chinese students by Zhang et al. (2007), and the validated version of the scale used in this study is the short form. The scale consists of 3 dimensions and 10 items, of which vigor corresponds to items LE1 - LE3, dedication belongs to items LE4 - LE6, and absorption refers to items LE7 - LE10. The revised scale is a 5-point Likert scale ranging from 1 (strongly disagree) to 5 (strongly agree).

3.2.3. Academic self-efficacy

The last section of the instruments was modified from the subscale of the *Patterns of Adaptive Learning Scales* (PALS) (Midgley et al., 1998). The adapted version of the scale contains one dimension with 12 question items (SE1 – SE12) and is a Likert scale with five points, in which 1 symbolizes strongly disagree and 5 indicates strongly agree. Among all the items, SE10 ("There were a few English courses that I felt I couldn't learn no matter how hard I tried") was a reverse-scored question, which, after processing, was coded together into SPSS (version 26).

Cronbach's Alpha was employed in this study to assess the instruments' internal reliability. The widespread consensus is that a Cronbach's Alpha score of 0.80 to 0.90 suggests that the instrument has an acceptable internal consistency, and a score higher than 0.90 indicates that the questionnaire has a solid internal consistency. (Bryman & Cramer, 2009; Devellis, 2017; Taber, 2018). Each variable in the scale was analyzed independently to determine the internal reliability range of the questionnaire, and the comprehensive test results were displayed in Table 1. Furthermore, the general criterion of >0.40 was met by the Corrected Item-Total Correlation (CITC) between the observed variables and their latent variables, indicating that each latent variable's measurement items are appropriately fitted and that the instruments' reliability can be considered reasonable. (Hobart & Cano, 2009). The variables under observation were removed by eliminating each item once. If the reliability index did not rise following the removal, the measurement items for the variable were considered to have high reliability. (Raykov, 2008). The results in Table 1 illustrate that the individual items were well-established, given that Cronbach's Alpha coefficient remained unchanged after eliminating every single item.

Table 1
Reliability of all the measures.

Variate	Item	CITC	Cronbach's Alpha if Item Deleted	Cronbach's Alpha
Student Burnout	–	–	–	0.840
Exhaustion	bn1	0.751	0.797	
	bn2	0.647	0.841	0.857
	bn3	0.687	0.824	
	bn4	0.722	0.810	
Cynicism	bn5	0.714	0.750	
	bn6	0.752	0.709	0.833
	bn7	0.627	0.833	
Reduced efficacy	bn8	0.742	0.797	
	bn9	0.708	0.829	0.860
	bn10	0.757	0.785	
Learning Engagement	–	–	–	0.900
	LE1	0.746	0.804	
Vigor	LE2	0.770	0.781	0.864
	LE3	0.711	0.837	
	LE4	0.748	0.785	
Dedication	LE5	0.743	0.792	0.858
	LE6	0.710	0.823	
	LE7	0.787	0.847	
	LE8	0.715	0.874	
Absorption	LE9	0.738	0.866	0.890
	LE10	0.794	0.844	
	SE1	0.734	0.937	
	SE2	0.734	0.937	
	SE3	0.772	0.935	
	SE4	0.723	0.937	
	SE5	0.705	0.938	
Academic Self-Efficacy	SE6	0.760	0.936	0.942
	SE7	0.758	0.936	
	SE8	0.726	0.937	
	SE9	0.723	0.937	
	SE10	0.658	0.939	
	SE11	0.776	0.935	
	SE12	0.743	0.936	

3.3. Procedures

The inquiry and data collection were mainly split into two distinct stages. Informed written consent was obtained after the researcher gave each participant an overview of the project's goals and intended uses, stating that their data would be handled anonymously and for scientific purposes only. After signing the written consent, participants were given access to the Wenjuanxing. The tool was administered in the participants' native language, Chinese Mandarin, and included an introductory part asking for biographical data and the three questionnaires mentioned above. After accessing the WeChat link to launch the Wenjuanxing application, respondents started completing the questionnaires. Within the allotted time, the researcher gathered all eligible questionnaires and extracted the data.

4. Results

4.1. Confirmatory factor analysis

Fig. 2 illustrates the validated CFA model for the *Student Burnout Scale utilizing the 24th version of AMOS*. To ascertain the validity of the verified CFA model, the current study gauged it by measuring the goodness-of-fit indices.

For practical application purposes, researchers should primarily look at the size of the chi-square value, significance, and fitness indicators such as the RMSEA value, the GFI value, and the CFI value as a basis for decision-making in determining whether the model achieves an overall level of fitness, as these indicator values have more sufficiency (Diamantopoulos & Siguaw, 2000). In addition, Hoyle (2013) suggests that in the test of model fitness indices, the researcher should provide the chi-square, GFI, NFI, and CFI values. This study reports the CMIN/Df,

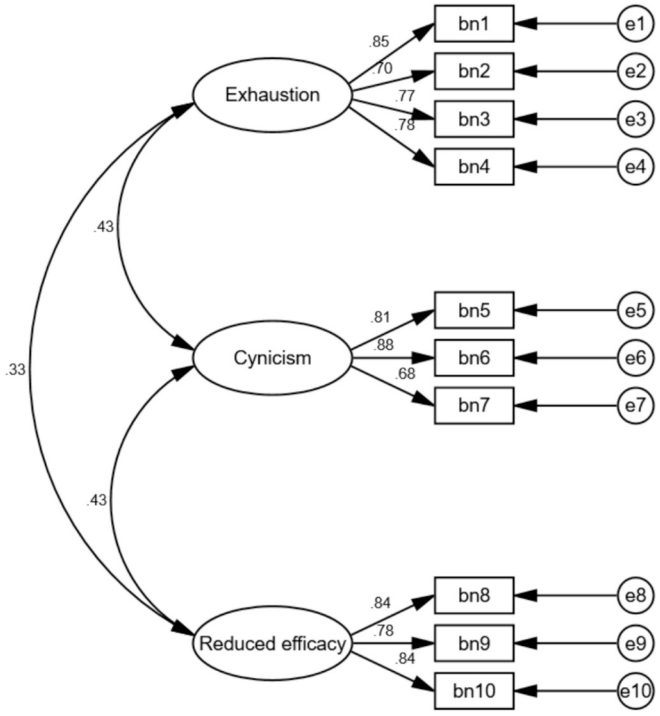


Fig. 2. CFA model of student burnout.

RMSEA, GFI, NFI, and CFI values to be included as indicators for testing model fit. In this regard, the AGFI value represents the adjusted GFI value, which is independent of the number of units, and the ratio of model variables to the degrees of freedom of the proposed model can be utilized to correct the GFI value, considering the number of parameters estimated and the number of observed variables (Wu, 2010). AGFI values were also reported for reference in the present study. A CMIN/Df score of <2 generally suggests that the proposed model fits the data better (Carmines & Melver, 1981). McDonald and Ho (2002) suggested that a value of RMSEA equal to 0.08 is the cut-off point for a suitable model fit range. For the other indices mentioned above, the criterion for determining the goodness of fit of the model path plots to the actual data is 0.90 or higher (Hu & Bentler, 1999). The goodness-of-fit indices for the data in Table 2 indicate that the validity of the *Student Burnout Scale* is relatively reasonable and that the triadic constructs of the scale (exhaustion, cynicism, and reduced efficacy) match the architecture of the sample data.

Likewise, by employing the CFA to measure the validity of the *Learning Engagement Scale*, the degree of correlation between the schematic's three-dimensional frameworks is depicted in Fig. 3, with the factor loadings for each of the vitality dimensions ranging from 0.77 to 0.88, the factor loadings for each of the dedication dimensions fluctuating from 0.80 to 0.84, and the factor loadings for the absorption dimensions spanning the range of 0.77 to 0.85.

Table 3 shows the results of using a goodness-of-fit index to assess the fit of the data, evaluated by the same criteria as mentioned above. The data clearly show that the scale has a high acceptance level and robust generalizability and applicability.

Finally, the composite reliability (CR) and convergent validity (AVE) for the measures related to burnout and engagement are reported in

Table 2
Goodness of fit indices for student burnout.

	CMIN/Df	RMSEA	GFI	AGFI	NFI	CFI
Standard values	<2	<0.08	>0.90	>0.90	>0.90	>0.90
Revised model	1.496	0.050	0.953	0.919	0.951	0.983

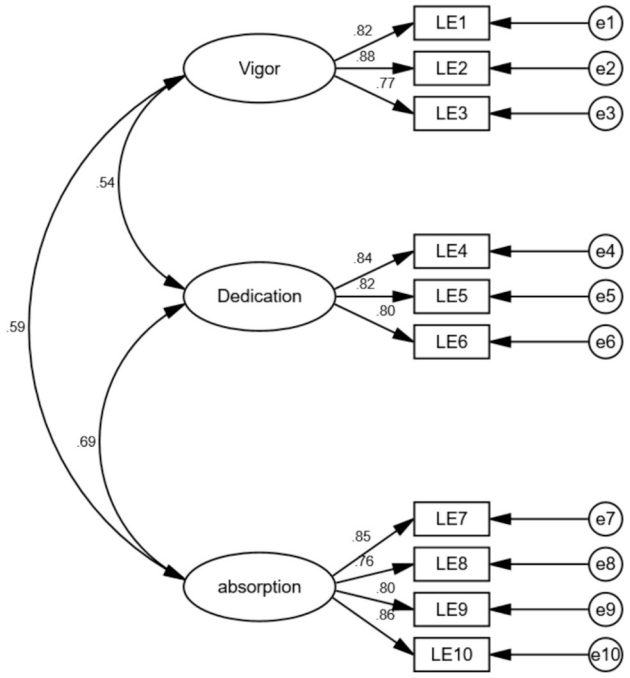


Fig. 3. CFA model of learning engagement.

Table 4. As a discriminant criterion assessing the model's fundamental merit, CR measures how well each latent variable is consistently explained by all the measurement items that make up that latent variable. Table 4 illustrates that all measurement items in each latent variable consistently describe that latent variable, with a CR larger than 0.60 (Diamantopoulos & Siguaw, 2000). The AVE value, reflecting each construct's convergent validity, can be applied to directly illustrate the proportion of measurement error that accounts for the variance attributed to the latent variable. The relative measurement error, which is usually required to be >0.50, diminishes as the AVE value increases (Fornell & Larcker, 1981). According to Table 4, the AVE scores in the present study demonstrate strong convergent validity since all of the results are above the conventional value of 0.50.

4.2. SEM analysis

SEM is a statistical analysis technique used to evaluate the viability of a given theoretical model with sample data. In an effort to confirm the validity of the proposed model, each retrieved set of data was characterized utilizing goodness-of-fit indices (Table 5) and SEM (Fig. 4). The model's CMIN/Df value is 1.619, below the general standard threshold of 3. The RMSEA is 0.056, lower than the standard level of 0.08, indicating the fit is better. GFI = 0.897, AGFI = 0.867, NFI = 0.894, IFI =0.957, CFI = 0.956, and TLI = 0.949, and the primary requirements are satisfied by all of the goodness-of-fit indices, signifying that the SEM created in this study is reliable and closely matches the collected data.

4.3. Correlation between burnout, engagement, and academic self-efficacy

The results of path analysis in Table 6 show that the standardized path coefficient of academic self-efficacy on learning engagement (β = 0.274, t = 3.411, p = .00 < 0.001) reached a significant level, indicating that learning engagement has a significant positive correlation with academic self-efficacy. The standardized path coefficient of learning engagement on student burnout (β = −0.675, t = −5.543, p = .00 < 0.001) is high, which indicates that learning engagement affects student burnout significantly. The standardized path coefficient of academic self-efficacy on student burnout (β = −0.411, t = −4.377, p = .00 < 0.001) achieved a remarkable level, suggesting that academic self-efficacy has a statistically significant adverse effect on student burnout. Hence the hypothesized model can be considered valid, suggesting that academic self-efficacy significantly reduces student burnout, thus validating the hypothesized model.

Table 3
Goodness of fit indices for learning engagement.

	CMIN/Df	RMSEA	GFI	AGFI	NFI	CFI
Standard values	<2	<0.08	>0.90	>0.90	>0.90	>0.90
Revised model	1.205	0.032	0.963	0.936	0.967	0.994

4.4. Mediating effect test

The overall effect of academic self-efficacy on student burnout is −0.596, and the 95 % confidence interval upper and lower limits are [−0.757, −0.411], which do not contain 0. The *P*-value (Table 7) is consistently lower than 0.05, which indicates that the overall impact of academic self-efficacy on student burnout is significant. To add robustness to the present analysis, results were obtained using the Bootstrap method for the mediating effect test, which involved 5000 sample repetitions and the 95 % confidence interval calculation. The direct effect value of academic self-efficacy on student burnout is −0.411, and the 95 % confidence interval upper and lower limits are [−0.587, −0.224], not containing 0.

Moreover, the P-value, which accounts for 68.95 % of the overall impact, is below the statistically significant threshold of 0.05. This indicates a substantial direct relationship between academic self-efficacy and student burnout. Since the P-value is less than the significant level of 0.05 and the indirect effect value is −0.185 with a 95 % confidence interval upper and lower limits of [−0.328, −0.072], which does not include 0, the hypothesis is to be considered valid. Learning engagement has been confirmed to have an intermediary effect between academic self-efficacy and student burnout is present, corresponding to 31.05 % of the total effect (see Table 7).

5. Discussion

Students' academic improvement benefits from the appropriate engagement and academic emotions, and English majors are no different. Consequently, it is necessary to clarify the mediating role of EFL learners' engagement in self-efficacy and burnout during EFL contexts. In response, the primary objective of the current study was to investigate how burnout, learning engagement, and academic self-efficacy are related and how learning engagement mediates between the two among Chinese EFL learners. To this end, the researcher created a hypothetical model, asked three research questions, and conducted CFA, SEM, path analysis, Pearson's correlation analysis, and mediating effects test to confirm the proposed hypotheses.

From a theoretical perspective, the current study further confirms the control-value theory (Pekrun, 2006), which posits that the more engaged and confident conduct learners perform during the learning process, the easier it is to dissolve negative emotions, such as learning engagement and self-efficacy, help mitigate students' academic burnout. When EFL learners' learning engagement and self-efficacy are maintained at a high level, their experience of academic burnout is more likely to be diminished. The statistically negative correlation between learning engagement and academic burnout in the present study can also be justified by accounting for the conservation of resources theory proposed by Hobfoll (1989), suggesting that learners will experience stress when they invest heaps of their resources and the returns fall short of what they expected. In Chinese EFL contexts, learners are often under

Table 4
Reliability of all the factors. *,***

Variate	Item	Standardized Estimate	Unstandardized				
			S.E.	t-value	P	CR	AVE
Exhaustion	bn1	0.855	–	–	–	0.858	0.603
	bn2	0.699	0.076	1.367	***		
	bn3	0.767	0.072	11.63	***		
	bn4	0.777	0.073	11.811	***		
Cynicism	bn5	0.813	–	–	–	0.837	0.634
	bn6	0.885	0.095	11.602	***		
	bn7	0.676	0.076	9.613	***		
Reduced Efficacy	bn8	0.842	–	–	–	0.861	0.674
	bn9	0.785	0.077	11.669	***		
	bn10	0.835	0.076	12.264	***		
Vigor	LE1	0.822	–	–	–	0.865	0.681
	LE2	0.881	0.082	13.048	***		
	LE3	0.769	0.074	11.572	***		
Dedication	LE4	0.838	–	–	–	0.860	0.671
	LE5	0.821	0.081	12.49	***		
	LE6	0.798	0.072	12.128	***		
Absorption	LE7	0.850	–	–	–	0.887	0.664
	LE8	0.766	0.069	12.311	***		
	LE9	0.796	0.067	13.005	***		
	LE10	0.844	0.073	14.141	***		
Academic Self-Efficacy	SE1	0.756	–	–	–	0.942	0.577
	SE2	0.759	0.107	11.101	***		
	SE3	0.802	0.093	11.838	***		
	SE4	0.749	0.09	1.931	***		
	SE5	0.722	0.099	1.488	***		
	SE6	0.786	0.091	11.554	***		
	SE7	0.781	0.091	11.477	***		
	SE8	0.753	0.093	1.998	***		
	SE9	0.749	0.088	1.929	***		
	SE10	0.675	0.092	9.711	***		
	SE11	0.802	0.109	11.835	***		
	SE12	0.768	0.103	11.255	***		

* P<0.05,
** P<0.01,
*** P<0.001.

Table 5
Goodness of fit indices for the proposed model.

	CMIN/Df	RMSEA	GFI	AGFI	NFI	CFI
Standard values	<2	<0.08	>0.90	>0.90	>0.90	>0.90
Revised model	1.619	0.056	0.897	0.867	0.894	0.956

tremendous pressure, especially EFL learners who are required to have abundant knowledge of the English language and culture, proficient English language skills, and a high level of language proficiency to meet social expectations and career demands. Burnout is one of the sources of stress for EFL students. Students may reduce their personal involvement to minimize the loss of individual resources when they perceive that the effort is not proportional to the gain during learning (Liu et al., 2023). This circumstance also explains why academic burnout is inversely proportional to the learning engagement among English majors. Yan (2021) also reported that college students' burnout is negatively associated with learning engagement. His explanation for this result is that students who maintain a positive mental state over time and engage their efforts in problem-solving rather than problem-emergence are effective in reducing the potential for negative emotions and reducing the level of academic burnout. Additionally, these findings are in congruence with the investigation of Marôco et al. (2020), indicating that university students' learning engagement is negatively affected by their academic burnout.

As with engagement in learning, academic self-efficacy is negatively correlated with student burnout. This relationship has been previously characterized as a correlation between an individual's psychological state and burnout (Hobfoll & Freedy, 2017). In conjunction with Bandura's (1977) social cognitive theory, academic self-efficacy can enhance or diminish frustration by influencing burnout in EFL learners. According to the above findings, self-efficacy is moderately correlated with engagement in learning and strongly associated with academic burnout. It seems that Chinese EFL learners with low self-efficacy tend to be more vulnerable to academic burnout. Comparatively speaking, we also discovered that while learning engagement and self-efficacy can significantly impact burnout, self-efficacy has a more direct effect. EFL learners with high self-efficacy are more likely to be motivated to join in the learning process, which contributes to progress in learning, experiencing a greater sense of achievement, feeling that they have realized their self-worth, and enhancing their academic self-efficacy, which in turn creates positive feedback that further strengthens their investment in learning, and they are also more interested in learning, and therefore less prone to academic burnout.

Results of the data also showed that there is a significant positive relationship between learning engagement and academic self-efficacy. The positive correlation confirms the results of several previous studies in different educational contexts (Kuo et al., 2021; Olivier et al., 2018; Zhen et al., 2017), identifying the virtuous circle triggered by the two variables. When faced with obstacles, a student who has a high level of self-efficacy is more likely to overcome them, study harder, and be more optimistic and self-assured (Martin & Rimm-Kaufman, 2015). These traits contribute to a student's increased engagement in the learning process. In other words, as proposed by social cognitive theory (Bandura, 1977), self-efficacy is an indicator of a person's belief in their own capability to execute a specific assignment. This belief affects the individual's behaviors and perspectives in order to influence the accomplishment of the behavior. Particularly, when EFL learners are more convinced of their ability to learn, they have a greater self-efficacy

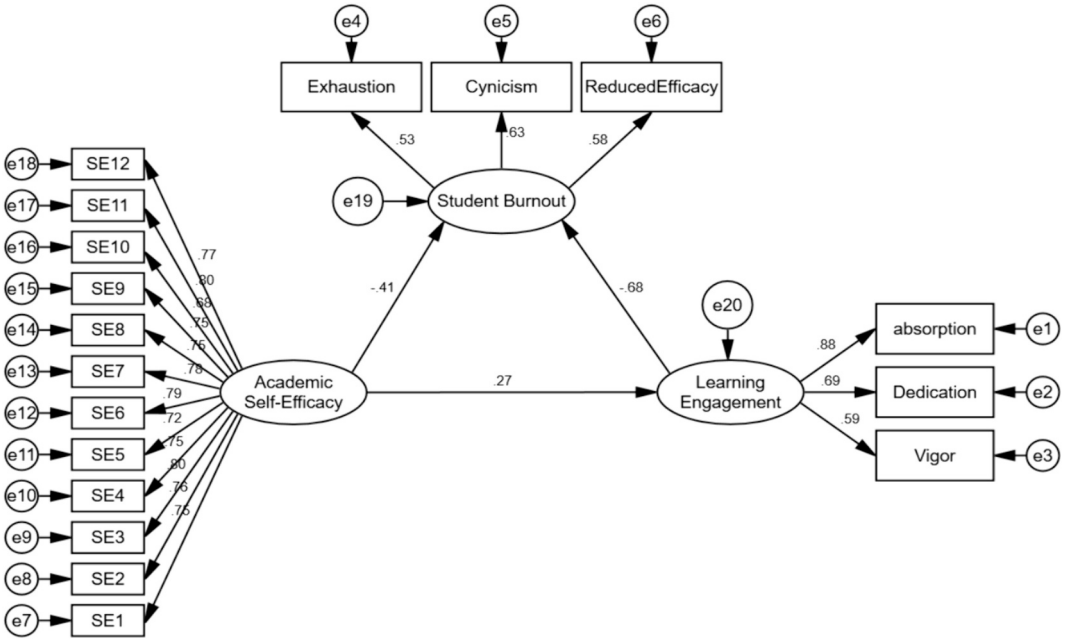


Fig. 4. The finalized SEM model.

Table 6
Results of multiple liner regression with SEM. *·***

Hypothetical path			β	S.E.	t	P	R^2
Learning Engagement	<––	Academic Self-Efficacy	0.274	0.090	3.411	***	
Student Burnout	<––	Learning Engagement	−0.675	0.070	−5.543	***	−0.542
Student Burnout	<––	Academic Self-Efficacy	−0.411	0.060	−4.377	***	−0.499

* P<0.05,
** P<0.01,
*** P<0.001.

Table 7
Mediating effect test.

Parameter	Estimate	95 % CI		P	Percent
		Lower	Upper		
(Total) Academic Self-Efficacy-Student Burnout	−0.596	−0.757	−0.411	0.000	–
(Direct) Academic Self-Efficacy-Student Burnout	−0.411	−0.587	−0.224	0.000	68.95 %
(Indirect) Academic Self-Efficacy-Learning Engagement-Student Burnout	−0.185	−0.328	−0.072	0.002	31.05 %

and are more likely to be involved in language learning tasks. These results are in line with Luo et al. (2023), which leads to the conclusion that self-efficacy plays an essential role in the improvement of learning engagement, especially for college students who encounter abundant pressure. When such confidence in English language learning is constructed, it is possible that EFL learners become more engaged in class.

To address the third research question, whether learning engagement could function as a mediator of academic self-efficacy to affect student burnout, data were analyzed using path analysis and mediating effect tests, which produced statistically significant results. According to the third research question, the relationship between Chinese EFL learners' self-efficacy and student burnout could be mediated by learning engagement. In other words, EFL learners are influenced by their environment (e.g., teachers, peers, instructional setting) to develop a strong sense of academic self-efficacy, with optimistic self-affirming beliefs that, in turn, generate positive emotions to overcome the adverse effects of negative emotions (e.g., burnout). These findings not only support Bandura's (1977) social cognitive theory but also provide strong support for Fredrickson's (2001), Fredrickson, 2003) undoing-effects hypothesis of positive emotions, which suggests that positive emotions mitigate the detrimental consequences of negative emotions. On the other hand, grounded in the control-value theory (Pekrun, 2006), it has been noted that self-efficacy beliefs can serve as an indicator of learning-related situations and thus arouse different academic emotions. The control-value theory focuses on multiple achievements and emotional experiences and the role of emotions in self-regulation, and EFL learners' academic self-efficacy influences their activities and behaviors to a certain extent, generating emotional encounters related to future accomplishments, outcomes, and subjective values, which in turn affect academic achievement.

From the perspective of the framework construction of the hypotheses, all the data from SEM analysis and goodness-of-fit indices were in line with the expectations, demonstrating that the proposed model is valid, i.e., learning engagement and academic self-efficacy negatively affect the burnout emotions of Chinese EFL learners, and academic self-efficacy can indirectly exert an influence on learning burnout by affecting the learning engagement emotions of EFL students. Considering all aspects, the current study's findings empirically support the proposed model.

6. Conclusion and implications

To conclude, the present study explored the relationship between student burnout, learning engagement and academic self-efficacy. The

three hypotheses formulated at the beginning of the study were fully confirmed by this empirical study. This study was therefore intended to focus on steering learners in EFL education and teaching sessions to face difficulties rather than avoid them and construct a strong sense of self-efficacy, which in turn creates positive emotions and reduces negative emotions, thereby supporting improved learning outcomes. As Dewaele and Li (2021) mentioned, the fundamental role of teachers in shaping students' engagement was also significant. Moreover, less burnout is probably going to benefit students' academic performance. Therefore, we suggest that educators intervene to increase students' academic self-efficacy, mitigate the detrimental effects of negative emotions and enhance the beneficial spillover effects associated with positive emotions. Recognizing the potential behaviors and situations that raise EFL students' burnout and taking the necessary steps to prevent these actions may contribute to this intervention. Consequently, students would experience reduced burnout due to facilitating EFL learners' effective engagement and confidence.

Based on the findings of this study and reflections on the research process, several implications can be made to expand future research. First of all, the number of experimental samples in this study was limited to 197 cases. Although it yielded satisfactory SEM results, the small sample size limited the study's scope, making the representativeness of the data a concern for broader generalization. Secondly, strictly speaking, although there is a large degree of negative correlation between the level of burnout and engagement in learning, it remains to be proved whether the two are fully compatible within individuals. In addition, it is recognized that rather than treating learning engagement as a type of academic emotion, some studies consider it to be "a joint product and culmination of perceptions of environmental factors and personal factors" (Dewaele & Li, 2021). Therefore, whether learning engagement is an emotion and its relationship to burnout warrants further exploration. Thirdly, the current study only discussed academic self-efficacy as a single dimension, neglecting the effects of its internal components on burnout and learning engagement. To deepen the understanding of the control-value theory, the internal construct of academic self-efficacy can be thoroughly investigated to explore how it promotes a range of distinct academic emotions. Fourthly, to gain additional theoretical support, examining the relationship between self-efficacy and other emotions, such as enjoyment, anxiety, and boredom, is recommended.

Authors' contribution

The authors have materially participated in the research and article preparation. Additionally, the authors have approved the final article.

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CRediT authorship contribution statement

Yilin Cong: Writing – original draft, Software, Methodology, Formal analysis, Data curation, Conceptualization. **Lei Yang:** Writing – review & editing, Visualization, Validation, Supervision, Resources, Project administration, Funding acquisition. **Anna Lia Proietti Ergün:** Methodology, Writing – review & editing.

Declaration of competing interest

The authors declare that they have no conflict of interest.

Data availability

The datasets analyzed during the current study are available from the corresponding author upon reasonable request.

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Informed consent

Informed consent was obtained from all the individual participants included in this study.

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