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Examining the mediation of engagement between self-efficacy and language achievement

Yuyang Cai [a] and Keke Xing [b]

[a]School of Languages & Centre for Language Education and Assessment Research, Shanghai University of International Business and Economics, Shanghai, People's Republic of China; [b]School of Languages, Shanghai University of International Business and Economics, Shanghai, People's Republic of China

ABSTRACT

Numerous studies have shown that students' belief in their ability to execute behaviours to successfully perform second/foreign language (L2) tasks (i.e. self-efficacy) is positively related to their L2 achievement. However, self-efficacy alone does not automatically lead to successful L2 achievement but has to be mediated by other psychological traits, such as language engagement, that are more directly related to task performance. Regardless, studies examining the interplay between self-efficacy and student engagement are scarce in L2 learning. To fill this gap, the current study investigated how engagement with L2 learning mediates the relation between self-efficacy and L2 achievement. We recruited 692 first-year undergraduate students studying English as an L2 from a university in mainland China (M_{age} = 18.76, SD = .76, females = 68%). Students' perceptions of self-efficacy in English and engagement with English were measured. Students' terminal English exam score was used to represent their L2/English achievement. Results of multilevel structural equation modelling showed that (1) self-efficacy was indirectly related to English achievement through engagement and that (2) only cognitive engagement mediated the effect of self-efficacy on L2 achievement. The results suggested the importance of accounting for engagement to understand the relation between self-efficacy and L2 achievement.

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Engagement; multilevel; self-efficacy; structural equation modelling; L2 achievement

Introduction

Students' belief in their second/foreign language (L2) ability to succeed has been acknowledged to play an essential role in determining their L2 learning processes, such as motivation (Bai, Nie, and Lee 2022), self-regulated learning (Teng 2021), engagement (Anam and Stracke 2016; Yang, Guo, and Yu 2016), or in determining their L2 achievement (Anam and Stracke 2020; Bai and Wang 2023; Kyo 2022). However, existing studies have mostly taken a fragmented view by either focusing on the relation between self-efficacy and learning processes such as motivation and self-regulated learning (Bai, Nie, and Lee 2022; Teng 2021), or on the relation between self-efficacy and learning achievement (Anam and Stracke 2020; Harris 2022; Mendoza et al. 2022). Only a limited number of studies have taken an integrated view to examine the mediation of the learning process factors in the relation between self-efficacy and L2 achievement (e.g. Bai and Wang 2023; Diseth 2011; Teng and Yang 2022).

Among the learning process factors, student engagement is receiving increasing attention in L2 research, possibly due to its close relation to task performance (Hiver et al. 2021). Regardless, the beneficial nature of engagement has mostly been taken for granted (see Hiver et al. 2021), with only a few

CONTACT Yuyang Cai sailor_cai@hotmail.com, ycai@suibe.edu.cn

studies empirically investigating its effect on L2 achievement or its mediation between self-efficacy and L2 achievement (Diseth 2011; Giladi, Koslowsky, and Davidovitch 2022; Yang, Guo, and Yu 2016). Further, in studies that explicitly addressed the mediation of engagement between self-efficacy and L2 achievement, engagement was usually operationalised as behavioural engagement (Diseth 2011; Giladi, Koslowsky, and Davidovitch 2022) or cognitive engagement under the disguise of self-regulated learning (Bai and Wang 2023), leaving other well-established dimensions (Fredricks, Blumenfeld, and Paris 2004) such as cognitive and emotional engagement understudied. Studies that contain more engagement dimensions rooted in engagement theory are needed to provide an integrated view of the mediation of engagement between self-efficacy and L2 achievement.

To fill the gaps in self-efficacy and engagement research, the current study aimed to examine the interplay between self-efficacy and engagement in determining L2 achievement. Specifically, the present study aimed to examine the hypothetical mediation of engagement between self-efficacy and L2 achievement.

Literature review

Self-efficacy and L2 learning

Self-efficacy refers to individuals' beliefs in their abilities to execute actions to handle situation-specific tasks (Bandura 1986). In educational studies, self-efficacy is labelled as academic self-efficacy and refers to students' confidence in their abilities to solve challenging tasks in learning domains (Kitsantas, Cheema, and Ware 2011). Academic self-efficacy has been acknowledged as a fundamental variable determining learning achievement (Bandura et al. 2001; Usher and Pajares 2008). According to the literature, students with high self-efficacy would believe their actions will produce desired outcomes (Graham 2022; Kitsantas, Cheema, and Ware 2011). With this belief, they would have higher motivation to take action or persist in the face of difficulties (Mills, Pajares, and Herron 2007; Talsma et al. 2018). As a result, self-efficacious students are likely to achieve more (Honicke and Broadbent 2016; Maddux and Kleiman 2016; Wang and Sun 2020). Given its importance, self-efficacy has been related to other factors believed to empower learning, such as motivation and self-regulation (Bai and Wang 2023; Bandura et al. 2001; Celik 2022; Schunk and Mullen 2012).

In L2 literature, numerous studies have been conducted on the relation between self-efficacy and L2 achievement. Results of existing studies have shown a positive relation between self-efficacy to L2 achievement in general (Anam and Stracke 2020; Kyo 2022) and specific L2 skills such as reading (Giladi, Koslowsky, and Davidovitch 2022), writing (Shen and Bai 2022), listening, and speaking (Harris 2022). These studies have been conducted across European countries such as Turkey (Canaran et al. 2020), Finland (Mendoza et al. 2022), and Norway (Diseth 2011), and in Asian countries such as China (Shen and Bai 2022), South Korea (Kyo 2022), Malaysia (Raoofi and Maroofi 2017), and Japan (Harris 2022). According to a recent meta-analysis (Wang and Sun 2020), the effect of self-efficacy on L2 achievement is more prominent in East than in the West cultural contexts.

The majority of the above studies not only provide evidence supporting a positive relation between self-efficacy and L2 achievement but also point to the fact that self-efficacy does not work alone but works together with other learner factors, for example, engagement, in determining L2 achievement. The following two parts cover the role of engagement and their interplay in determining L2 achievement.

Student engagement and L2 learning

Student engagement (henceforth, engagement) is a multi-faceted construct that encompasses learners' thoughts, feelings, and behaviours (Fredricks, Blumenfeld, and Paris 2004). Initially,

Fredricks, Blumenfeld, and Paris (2004) identified three engagement factors: behavioural, cognitive, and emotional engagement. Behavioural engagement highlights students' observable participation in learning activities, such as hand raising and gaze, or involvement in curricular and extracurricular activities, such as effort, concentration, and persistence (Schnitzler, Holzberger, and Seidel 2021; Skinner and Belmont 1993). Cognitive engagement focuses on learners' intentional thoughts dedicated to learning, such as attentional investment, processing intensity, or self-regulated learning or strategies (Fredricks, Filsecker, and Lawson 2016; Reeve and Tseng 2011; Skinner and Belmont 1993). Emotional engagement concerns learners' positive and negative reactions to learning activities and environments, including enthusiasm, interest, enjoyment, boredom, identification, belonging, value, and attitude (Meyer and Turner 2002). Svalberg (2009) and Fredricks, Filsecker, and Lawson (2016) add social engagement to highlight interactions with others. Reeve and Tseng (2011) propose agentic engagement that emphasizes students' constructive contributions during the learning process. Most recently, Arndt (2023) recommends linguistic engagement to emphasize learners' conscious focus on processing linguistic features. Regardless, the conventional three dimensions of engagement have received the most attention (Bond et al. 2020; Hiver et al. 2021; Järvinen et al. 2022) and are the focus of the current study.

During the past two decades, engagement has gradually become a popular topic in L2 research. In this area, engagement also has the labels of language learner engagement (Hiver et al. 2021; Mercer 2019), engagement with language (Svalberg 2021), or language engagement (Svalberg 2018). Engagement has been acknowledged as a crucial antecedent of successful L2 achievement (Hiver, Al-Hoorie, and Mercer 2020; Hiver et al. 2021; Mercer 2019; Mercer and Dörnyei 2020; Philp and Duchesne 2016). However, most existing studies have focused on issues such as the conceptualisation and measurement of engagement in L2 contexts (Oga-Baldwin 2019) or its relation to other learning process variables such as effort, persistence, and well-being (Hiver et al. 2021). Only a limited number of studies have directly examined the relation between engagement and L2 achievement under the theoretical framework of student engagement (Brutt-Griffler and Jang 2022; Yang, Guo, and Yu 2016). For instance, Brutt-Griffler and Jang (2022) found that neither school identification (emotional engagement) nor school commitment (behavioural engagement) of the sixth graders studying in a bilingual school in the United States was significantly related to their L2 achievement (English). Similarly, Yang, Guo, and Yu (2016) failed to identify a significant relation between the number of interactions (behavioural engagement) and L2 achievement (we will return to this in the following part). These attempts suggested the importance of empirically investigating the relation between engagement and L2 achievement instead of taking its effect for granted.

Self-efficacy, engagement, and L2 achievement

Self-efficacy plays a vital role in determining student engagement (Zimmerman and Martinez-Pons 1990), which in turn determines learning outcomes (Oga-Baldwin 2019). It is believed that students' high confidence in learning enables them to make an extra effort to regulate their motivations and cognitions, continuously increase task commitment, and attain their designated learning outcomes (Anam and Stracke 2020; Bresó, Schaufeli, and Salanova 2011).

A large portion of L2 studies examining the interplay between self-efficacy and engagement focus on the power of self-efficacy in predicting engagement (Anam and Stracke 2016; Bai, Nie, and Lee 2022; Yang, Guo, and Yu 2016). Anam and Stracke (2016) explored the relation between Indonesian primary school students' language learning strategy use (cognitive engagement) and L2 self-efficacy. Results of a non-parametric test with 522 sixth graders indicated that high self-efficacy students reported a significantly higher frequency of strategy use. Their later study confirmed the positive relationship between self-efficacy and cognitive engagement (Anam and Stracke 2020).

Bai, Nie, and Lee (2022) examined the relations between three motivational variables (i.e. English self-efficacy, task importance, and interest) and three types of learning behaviours (i.e. class/

behavioural engagement, metacognitive self-regulation, and avoidance coping) among 1,954 secondary students learning English in Singapore. Multiple regression analysis results showed that English self-efficacy significantly predicted behavioural engagement. This positive relation between self-efficacy and behavioural engagement was confirmed in Kyo (2022), which involved 4,501 secondary school students learning English in South Korea.

Another study included all three types of engagement, namely, behavioural, cognitive, and emotional engagement (Han, Geng, and Wang 2021). This study investigated 428 Chinese undergraduate English learners' satisfaction, self-efficacy, and engagement in online English learning during the outbreak of COVID-19. Results of structural equation modelling showed that self-efficacy positively predicted all three types of engagement.

In contrast to the significant attention to the association between self-efficacy and engagement, there are a few studies (e.g. Giladi, Koslowsky, and Davidovitch 2022; Yang, Guo, and Yu 2016) that explicitly explored the mediating role of engagement in the relation between self-efficacy and L2 achievement, as called out in Oga-Baldwin (2019). Yang, Guo, and Yu (2016) examined the associations among Chinese students' interest and self-efficacy in translation, their behavioural engagement (i.e. number of interactions) during online collaborative translation learning, and translation performance. Drawing on data from 48 s-year undergraduate students, they found that students' behavioural engagement was positively associated with their self-efficacy in translation. However, they failed to identify a mediation effect of behavioural engagement on the relation between self-efficacy and post-test translation score because of the nonsignificant association between behavioural engagement and translation performance.

In a two-wave longitudinal study, Giladi, Koslowsky, and Davidovitch (2022) explored L2 self-efficacy, general self-efficacy, and effort (behavioural engagement) as predictors for L2 reading comprehension from 265 undergraduate students. Results of correlation analyses showed that L2 self-efficacy was positively related to effort, which was positively related to L2 reading. Further analysis confirmed that effort mediated the relation between L2 self-efficacy and L2 reading performance.

Although information regarding the mediation of engagement between self-efficacy and L2 achievement is still quite limited, studies in other domains might still shed light on our study. Pintrich and De Groot (1990) examined the relationships among motivation variables (including academic self-efficacy and intrinsic value), self-regulated learning (i.e. cognitive and metacognitive strategies), and academic performance (English) of 173 seventh graders in the United States. The correlation results indicated that self-efficacy was positively related to cognitive engagement and English achievement (seatwork performance). Besides, regression analysis results showed that cognitive engagement and self-efficacy positively predicted English achievement. Meanwhile, intrinsic value (similar to emotional engagement) was not directly related to achievement but strongly related to cognitive and metacognitive strategies. The results suggested the possible mediation of cognitive engagement between self-efficacy and English achievement.

A similar study was conducted by Metallidou and Vlachou (2007) with 263 Grade Five and Grade Six students in Greek. Results of regression analysis suggested that self-efficacy positively predicted cognitive strategies (cognitive engagement) and academic achievements (including mathematics and Greek). However, the mediated effect of self-efficacy by cognitive strategies was only significant for mathematics rather than Greek achievement. These results suggested the different performances of cognitive engagement in different domains or cultures.

In another longitudinal study, Galla et al. (2014) examined the within-person and between-person effect of effortful engagement (a combination of behavioural and cognitive engagement activities) and academic self-efficacy on academic performance in reading and math across 135 students in elementary students in the United States. They found that effortful engagement mediated the relation between academic self-efficacy and academic achievement at the between-person level. However, the mediation was not significant at the within-person level. These results suggested that the different functions of effortful engagement emerged from within-person and between-person data (analogical to cross-sectional analyses).

The reciprocal relations among self-efficacy, emotional engagement, behavioural engagement, and math achievement have also been observed in Olivier et al. (2019) with 671 students in Canada from their 4th to 6th grade. Results of cross-lagged analysis suggested a reciprocal relationship between self-efficacy and achievement. Besides, self-efficacy was found to predict later emotional engagement, which in turn negatively predicted later academic achievement. This result suggested a negative mediating effect of emotional engagement between self-efficacy and math achievement. No mediating effect of behavioural engagement was supported in the study.

A brief review of the literature in L2 and other domains provided at least the following information: (1) self-efficacy positively predicts L2 engagement in three dimensions: behavioural, cognitive, and emotional engagement, (2) engagement has the potential to mediate the relation between self-efficacy and L2 achievement, but the mediation seems to be very unstable and depends on factors such as the dimensions of engagement measurement. Drawing on the literature, the current study aimed to examine the mediation of L2 engagement between self-efficacy and L2 achievement, focusing on the mediation of engagement in three dimensions: behavioural, cognitive, and emotional.

The present study

The present study aimed to address the following research question: How does engagement mediate the relationship between self-efficacy and English achievement?

Method

Participants

This study was conducted with 692 first-year undergraduate students ($M_{age} = 18.4$, $SD = 0.77$; females = 70%) taught by 42 different English teachers in a university in mainland China. According to the 99% passing rate of the College English Test Band Four of first year undergraduate students at the sampled university, their English proficiency level was about the level of the Common European Framework of Reference for Languages (CEFR) B2, according to a recent calibrating study (Jin, Jie, and Wang 2022). Students were distributed in nine different disciplines: international economics and trade (32%), financial management (28%), accounting (11%), business management (9%), and statistics (8%). The remaining 12% was from law, tourism, business negotiation, and foreign studies. Two questionnaires were delivered to measure students' English self-efficacy and engagement with English.

Before data collection, consent was obtained from the participating university and the student participants. All students were aware of the right to withdraw whenever they felt the need to do so. The questionnaire data were collected one week before the end of the semester (the terminal examinations week). The terminal English exam scores were collected to represent their L2 achievement.

Instruments

Self-efficacy

Self-efficacy was measured using the English Self-Efficacy Questionnaire (ESEQ), a 6-item scale adapted from the self-efficacy subscale of the MSLQ developed by Pintrich et al. (1991). Students were asked to evaluate their extent of aspiration to succeed in their college English courses on a six-point scale (1 = Strongly Disagree, 6 = Strongly Agree). The mean of the overall scale was $M = 4.17$ ($SD = 1.05$) and the Cronbach's alpha was $\alpha = .96$. Details of the scale are shown in the Appendix.

Engagement

Engagement was measured using the Engagement in English Learning Questionnaire (EELQ) adapted from Reeve and Tseng (2011). The EELQ asked students to evaluate their extent of engagement in English learning on a six-point scale (1 = Strongly Disagree, 6 = Strongly Agree) on three aspects: behavioural engagement (4 items, $M = 4.46$, $SD = .96$, $\alpha = .90$), cognitive engagement (4 items, $M = 4.51$, $SD = .93$, $\alpha = .92$), and emotional engagement (4 items, $M = 4.60$, $SD = 1.00$, $\alpha = .90$) (See the Appendix for details).

English achievement

The terminal course examination scores were collected to represent English achievement. The examination covered vocabulary, grammar, listening, reading, and writing. The mean for our sample was $M = 69.87$ out of 100 ($SD = 11.06$).

Data analyses

Primary data analysis involved three steps: (1) evaluating the measurement quality of each multiple-indictor instrument (i.e. self-efficacy and engagement) using confirmatory factor analysis, (2) conducting multilevel structural equation modelling (ML-SEM) to explore the relationships between self-efficacy, engagement, and English achievement.

Mplus Version 8.8 (Muthén and Muthén 1998–2022) with maximum likelihood robust (MLR) was used for these analyses. Model-data fit was evaluated by consulting comparative fit index (CFI), Tucker-Lewis index (TLI), root mean square error of approximation (RMSEA), and standardised root mean square residual (SRMR). TLI and CFI values of 0.99, 0.95, 0.92, and 0.90 and RMSEA and SRMR values of 0.01, 0.05, 0.08, and 0.10 were referred to as criteria for judging whether the tested model is excellent, good, fair, or mediocre (Marcoulides and Yuan 2017).

Results

Preliminary analyses

Table 1 shows the bivariate correlations among key study variables. English achievement was positively related to self-efficacy and all engagement factors, with a relatively larger correlation with cognitive engagement than the correlations of English achievement with other predictors. Self-efficacy was also positively related to all engagement factors.

Model-fit results

Table 2 shows the model fit results. The eight-item self-efficacy scale (Model 1) had an excellent fit after releasing two pairs of error covariances (two items addressing assessment and the other two addressing classroom performance). Each of the engagement subscales also showed a good model fit. The behavioural engagement subscale (Model 2a) almost had a perfect fit after releasing one pair of error covariance (both addressing attention in class). The cognitive engagement subscale (Model 2b) also had an almost perfect fit without any model modification. The emotional engagement

Table 1. Correlations.

	Self-efficacy	Behavioural engagement	Cognitive engagement	Emotional engagement
English achievement	.291*	.289*	.344*	.329*
Self-efficacy		.541*	.627*	.663*
Behavioural engagement			.656*	.685*
Cognitive engagement				.689*

*$p < .01$.

Table 2. Model fit indices.

Model	χ^2	*df*	*p*	CFI	TLI	RMSEA (95% CI)	SRMR
Model 1. Self-efficacy (1&5, 6&8)	14.459	7	0.043	.998	.996	.039 (.006, .068)	.008
Model 2a. Behavioural engagement (1&2)	0.948	1	0.330	1.000	1.000	.000 (.000, .099)	.002
Model 2b. Cognitive engagement	0.282	2	0.869	1.000	1.000	.000 (.000, .039)	.002
Model 2c. Emotional engagement (10&12)	2.460	1	0.117	.999	.995	.046 (.000, .122)	.005
Model 3. Structural equation model	595.493	140	<.001	.961	.953	.069 (.063, .074)	.037
Model 4. Multilevel-structural equation model (ML-SEM)	412.079	140	<.001	.964	.956	.053	.037 (within)

subscale had a good fit after releasing a pair of error covariances addressing in-class activities. The full structural model (Model 3) combining all key variables had a fair fit. The final ML-SEM (Model 4), after controlling for variance at the teacher level, produced a good fit again.

Results of multilevel structural equation modelling (ML-SEM)

The estimates of the final ML-SEM model are shown in Figure 1. Self-efficacy positively predicted all engagement factors: $\beta = .54$ ($p < .001$) for behavioural engagement, $\beta = .65$ ($p < .001$) for cognitive engagement, and $\beta = .70$ ($p < .001$) for emotional engagement. However, the direct path coefficient from self-efficacy to English achievement was nonsignificant ($\beta = .06$, $p = .35$). Regarding the relation between engagement factors and English achievement, only cognitive engagement significantly predicted English achievement ($\beta = .23$, $p < .001$). Neither behavioural engagement ($\beta = .01$, $p = .95$) nor emotional engagement ($\beta = .13$, $p = .37$) significantly predicted English achievement. Drawing on the above results, we concluded that self-efficacy only indirectly predicted English achievement: $\beta = .15$, 90% CI [0.09 0.21], $p < .001$.

Discussion

The current study examined the interplay between self-efficacy and engagement in predicting L2 achievement. Drawing on the self-efficacy theory (Bandura 1986; Bandura et al. 2001) and engagement theory (Fredricks, Blumenfeld, and Paris 2004; Fredricks, Filsecker, and Lawson 2016), we hypothesized that engagement would mediate the relation between self-efficacy and L2

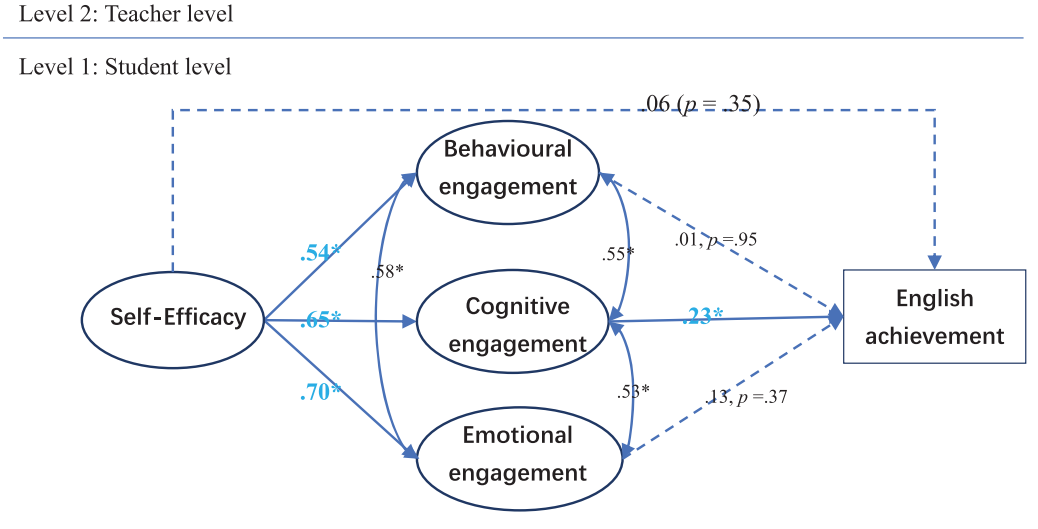

Figure 1. ML-SEM results with standardised estimates (within) * $p < .01$.

achievement. This hypothetical mechanism was tested with the data on English self-efficacy and engagement generated by 673 first-year undergraduate students studying English as a foreign language (L2) in a university in mainland China. Our results showed that self-efficacy positive predicted all engagement factors, among which only cognitive engagement directly predicted English achievement. Overall, we concluded that engagement (specifically, cognitive engagement) significantly mediated the relation between self-efficacy and English achievement.

First, our results showed that self-efficacy was positively related to all engagement factors included. This finding underscores the fundamental function of self-efficacy in executing actions during learning (Bandura 1986; Usher and Pajares 2008; Zimmerman and Martinez-Pons 1990). The result is consistent with the L2 literature on the positive relation of self-efficacy to cognitive engagement (Anam and Stracke 2016, 2020), behavioural engagement (Bai, Nie, and Lee 2022), and emotional engagement (Yang, Guo, and Yu 2016).

As suggested by the engagement measure in our study, students with high self-efficacy are more ready to participate in class activities, intensively employ cognitive resources to seek solutions to challenging tasks, and enjoy what they do and learn in their English class. On the contrary, students with low self-efficacy are inclined to shy away from class activities, avoid trying new approaches to enhance learning or easily feel bored during English classes. The various effect sizes of the relations of self-efficacy to different engagement factors suggested that cognitive engagement appears more responsive to self-efficacy than emotional and behavioural engagement.

Second, our results suggested that among all engagement factors included, only cognitive engagement directly predicted English achievement. This indicated that, if students engaged in intensive cognitive activities, such as activating schema, actively analysing and integrating newly obtained information, and flexibly applying cognitive resources to solve learning problems, their English achievement would be significantly higher. This positive relation between cognitive engagement and achievement is consistent with previous studies with K-12 students' L1 achievement in the United States (Pintrich and De Groot 1990) and mathematics achievement in Greek (Metallidou and Vlachou 2007). This consistency suggested the important direct role of cognitive engagement in predicting academic achievement across domains, study levels, and cultures. However, our finding about the direct relation of cognitive engagement to achievement is inconsistent with what Metallidou and Vlachou (2007) found about primary students' Greek achievement. This inconsistency also suggested the possible variation of cognitive engagement effect on learning achievement across study levels, language types, or cultures. Together, this comparison results reminded us of the importance of obtaining more empirical evidence to reveal the relation between cognitive engagement and achievement in specific domains such as L2 learning.

Third, our study showed that the relation between behavioural engagement and English achievement was nonsignificant. This nonsignificant relation corroborates what has been found about the relationship between behavioural engagement and learning achievement related to L2 learning (Brutt-Griffler and Jang 2022) and mathematics learning (Olivier et al. 2019). The consistency suggested that higher effort investment does not necessarily immediately bring about gaining in learning achievement. This nonsignificant relation, however, should not be interpreted as that behavioural engagement is of little help to learning. As suggested in the current study and in the literature (Pintrich and De Groot 1990), behavioural engagement is usually closely related to other engagement factors, for example, cognitive engagement activities (Galla et al. 2014), in facilitating learning.

In addition, our study showed that emotional engagement was not significantly related to English achievement. This finding means that students who reported more enjoyment of in-class English learning or more involvement in class activities did not necessarily score higher in the terminal English exam than their peers. The result echoed previous L2 studies such as Brutt-Griffler and Jang (2022).

However, the result is against the general findings in motivation research, another strand of research closely related to engagement studies (Arndt 2023), which generally supports a strong

positive relation between enjoyment of L2 learning (Dewaele and Alfawzan 2018) and learning in general (Xie, King, and Cai 2022). One interpretation for the absent direct relation is that emotional engagement facilitates learning achievement by working through other engagement factors (e.g. cognitive engagement), as shown in the correlations among the three engagement factors in the current study. Pintrich and De Groot (1990) also found that intrinsic value (similar to emotional engagement) was not directly related to English achievement but strongly related to cognitive and metacognitive strategies, which in turn directly predicted English achievement. Another possible interpretation for this absent direct relation is the hypothetical double-sword effect of student effort (Marsh et al. 2016; Olivier et al. 2019). According to this hypothesis, students could be highly interested and enjoy English learning but at the same time not succeed (Olivier et al. 2019). This hypothetical interpretation has yet to be studied in future research.

Finally, the integrated finding depicting the interplay among self-efficacy, different engagement factors, and English achievement in the current study suggested that self-efficacy was fully mediated by cognitive engagement in predicting English achievement. This result is consistent with Galla et al. (2014), who identified the mediation of effortful engagement (including cognitive engagement) between self-efficacy and reading and math achievement. This finding corroborates the self-efficacy theory that students' strong belief in their ability to succeed would drive them to exert extra effort, increase their enjoyment of learning, activate in-depth cognitive resources and apply them efficiently, which would ensure more learning gains (Bandura, 1993).

Our finding showed that the effect of self-efficacy on English achievement was fully mediated by cognitive engagement, whereas in Galla et al. (2014), self-efficacy also had a direct lagged effect on reading and math achievement. Apart from the differences in achievement variables, students' study levels, cultures, and study designs, another possible reason for this difference might be the difference in engagement measurement. In our study, we included three separate dimensions (i.e. behavioural, cognitive, and emotional engagement), whereas Galla et al. (2014) only measured behavioural engagement. It is highly possible that the direct relation between self-efficacy and achievement in Galla et al. (2014) would have diluted or faded away if they had accounted for emotional and/or cognitive engagement. This difference suggested the importance of including a relatively comprehensive list of engagement factors when examining the interplay among self-efficacy, engagement, and achievement.

Conclusion, limitations, and implications

Our study showed that self-efficacy is an influential factor explaining the variation in English achievement and that this effect was fully mediated by student engagement, specifically, cognitive engagement.

It is important to acknowledge several limitations of the current study. First, although our study included multiple engagement factors, there are still other engagement factors that we still need to account for, such as social engagement, agentic engagement, and linguistic engagement. Future studies can incorporate a broader assessment of engagement to approach a more realistic understanding of the mediation of engagement between self-efficacy and L2 achievement. Second, despite the solid theoretical basis of self-efficacy theory and engagement theory, the study was not experimental by nature and the results were not derived from longitudinal data that would otherwise have allowed a more rigorous exploration of the mediation effect. Further studies may apply longitudinal data or experimental work to determine the causal nature among self-efficacy, engagement, and L2 achievement. Third, although the study recruited a relatively large sample of participants, they were from the same university studying in the same grade. Hence, generalisation to other L2 learning contexts should be cautioned until the results can be replicated across more diverse L2 learner populations.

Despite the limitations, our results have theoretical and practical implications. Our results indicated that the cascading effects of self-efficacy, engagement, and L2 achievement are more

complicated than what was generally assumed. First, this study provided evidence revealing the direct relations between different types of engagement and L2 achievement. As a relatively young area of L2 research (at least, research formally using the label of engagement), existing studies mainly focused on conceptualising engagement or variables that predict engagement. In this research scenario, engagement has been treated as a dependent variable whose beneficial nature to L2 learning is taken for granted. The results regarding differential effects of different types of engagement could function as a reminder of the necessity to seek more evidence to support this assumed relation in other contexts.

Second, a fundamental assumption of self-efficacy theory is that self-efficacy contributes to learning for its role in enhancing other learning facilitators, which in turn benefits learning achievement. Under this assumption is the mediation mechanism of engagement between self-efficacy and learning achievement. However, studies explicitly addressing this mechanism are rare. The mediated effect of cognitive engagement on L2 achievement found in our study filled in the need for more evidence. Future studies are also necessary for learning in other academic domains intertwined with L2 learning.

The study also has practical implications. There has been growing awareness of the connection between the psychological traits of students, such as motivation, cognition, and cognition-based motivation (Cai and Yang 2022). Hence, researchers, educators, and policymakers are increasingly eager to improve these psychological traits through direct instruction. As such, effective instruction intervention programmes could be implemented to foster students' self-confidence in their ability to succeed in L2. This self-efficacy enhancement programme should better be combined with the coaching of students' behavioural, cognitive, and emotional engagement with L2 learning. During this course, additional attention could be given to training cognitive strategies, such as linking on-site learning to prior knowledge, actively analysing learning materials, and synthesizing information newly obtained from the L2 studies.

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No potential conflict of interest was reported by the author(s).

ORCID

Yuyang Cai http://orcid.org/0000-0002-0320-4602
Keke Xing http://orcid.org/0000-0002-5928-9756

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Appendix

Self-efficacy	SE01. I believe I will receive an excellent grade in English class.
	SE02. I'm confident I can understand the basic concepts taught in this English course.
	SE03. I'm confident I can understand the most complex material presented by the instructor in this English course.
	SE04. I'm confident I can do an excellent job on the assignments and tests in this English course.
	SE05. I expect to do well in this English class.
	SE06. I'm certain I can master the skills being taught in this English class.
Behavioural engagement	EG01. I pay attention in English class.
	EG02. When I'm in English class, I listen very carefully
	EG03. In English class, I work as hard as I can
	EG04. When I'm in English class, I participate in class discussions
Cognitive engagement	EG05. When doing schoolwork, I try to relate what I'm learning to what I already know.
	EG06. When I study, I try to connect what I am learning with my own experiences.
	EG07. I try to make all the different ideas fit together and make sense when I study.
	EG08. When what I am working on is difficult to understand, I change the way I learn the material
Emotional engagement	EG09. When I'm in English class, I feel good
	EG10. When we work on something in English class, I feel interested.
	EG11. English class is fun
	EG12. I enjoy learning new things in English class.