Article

Metacognitive Strategies, Language Learning Motivation, Self-Efficacy Belief, and English Achievement During Remote Learning: A Structural Equation Modelling Approach

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Abstract

Metacognitive strategies, language learning motivation, and self-efficacy belief are crucial to online or remote learning success. The purpose of the present study was to evaluate the interrelationship among metacognitive strategies, language learning motivation, self-efficacy belief, and English learning achievement. The data were collected from three surveys and an English test. The participants were 590 Chinese university students. The findings revealed that self-efficacy belief predicts English learning achievement. In particular, metacognitive strategies and language learning motivation mediate the predictive effects of self-efficacy belief on English learning achievement. The findings show the potential of enhancing online English learning achievement by facilitating learners' self-efficacy belief, motivation, and metacognitive strategies. Implications can be gained for remote learning within and beyond the coronavirus (COVID-19) context.

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Introduction

When the 2019 novel coronavirus (COVID-19) shuttered the education sector, online instructional delivery emerged as an important alternative to in-person teaching. Even so, there have been concerns about students' adaptation to remote learning, as well as their learning achievement. Although some studies have suggested that there were no significant differences in learning outcomes between remote and traditional classroom-based learning (e.g. Johnson et al., 2000), some have also suggested that students found remote learning challenging and the limited interaction in remote learning decreased learners' course satisfaction and performance (Kuo et al., 2014). In contrast to classroom-based learning environments, remote learning requires learners to be confident, willing, and able to self-manage their learning process. Learners with less confidence may find remote learning activities to be more challenging and tend to be less alert in seeking opportunities to interact with the instructor or classmates, thus leading to unsatisfactory learning outcomes (Lin et al., 2017). In ensuring success in online learning, it is essential to explore learners' self-efficacy belief in regulating and monitoring their own learning process, and how learners' self-efficacy belief predicts their English learning achievement in the online learning environment.

Learners' conscious or unconscious use of metacognitive strategies affects their self-efficacy belief in regulating their learning process (Barnard et al., 2009). That said, knowledge and practices of metacognitive strategies are essential for remote learning. However, we do not fully know how learners can optimally understand and harness metacognitive strategies in remote learning and how such perceptions may influence their self-efficacy belief in regulating their learning. After all, remote learning requires learners to adopt metacognitive strategies to self-assess their learning and determine how to make changes when goals shift from their predetermined plans (Carter et al., 2020). The conscious understanding and use of metacognitive strategies might be especially difficult for learners in a remote learning context and they may not have appropriate self-regulation, co-regulation, and shared-regulation experiences (Hadwin et al., 2018). The demands in remote learning may lead learners to differentiate abilities to participate in learning without carefully taking their strategy use into consideration. We may need to consider the extent to which learners' metacognitive strategies mediate the effects of learners' self-efficacy belief on English learning achievement.

In addition to metacognitive strategies, we must also consider whether remote learning environments can support the affective aspects of learning, such as learner motivation (Ryan and Deci, 2000). According to Deci and Ryan's (2000) self-determination theory (SDT), motivation is a major contributing factor to learner success. Based on SDT, remote learning environments should be structured to support motivation and overall success in learning. Learners who possess a higher level of motivation may be more likely to conduct deep-level cognitive processing and be more engaged in remote learning. Learners' motivation, including what they ought to do and what they wish to do, could guide their utilization of the available learning resources, which could largely mediate their level of self-efficacy belief, i.e. their confidence in acquiring knowledge (Hong et al., 2017). However, the research to date has provided limited evidence regarding the mediating role of motivation on self-efficacy belief and English learning achievement.

The main purpose of the present study is to assess metacognitive strategies, language learning motivation, self-efficacy belief, and English learning achievement in the context of remote learning. In particular, the focus was on the predictive effects of self-efficacy belief on English learning achievement and the mediating effects of metacognitive strategies and motivation on self-efficacy belief and English learning achievement. There are several reasons for us to focus on English learning. First, unlike other subjects, learning a language is both a personal and a social matter. The personal reflects the learner's identity and attitudes toward the target language as well as the social and cultural resources available in target-language communities. The social reflects the learner's perceptions of the status or power of a particular language. Both personal and social matters highlight the need to explore learners' motivation and perceptions of strategy use. Second, among all subjects, the context of learning English as a foreign language (EFL) is especially challenging due to limited target language input and the pressure to take an online language course. Researchers have found that online EFL courses in higher education were not as effective as their offline counterparts (Lin et al., 2017). Many factors, e.g. metacognitive strategies, language learning motivation, and self-efficacy belief, may contribute to this challenge.

As argued by Zheng et al. (2018), successful online English learning requires a high degree of autonomy, including motivation, self-directed learning practices, and the confidence to manage one's own time and learning pace. Given that students with high motivation and good self-regulation skills were likely to succeed in online learning, we examined the effect on English learning achievement while considering learners' metacognitive strategies, language learning motivation, and self-efficacy belief. The present study contributes to previous studies through disseminating timely information for promoting English language learning in the context of remote learning.

Literature Review

Language Learning Motivation

Language learning motivation is a variable for delineating individual differences among L2 learners in online learning (Zheng et al., 2018). Motivation, as conceptualized by Dörnyei (1996), involves both personal and social matters that influence one's attitudes toward learning the target language. Personal factors, e.g. prior learning experiences, growth, and achievement, and social factors, e.g. perceptions of the status or power of the target language, can affect students' language learning motivation (Noels et al., 2000). Dörnyei (2005) proposed the L2 Motivational Self System, which included the concepts of possible, ideal, and ought-to selves. The focus was on the direction and magnitude of human behaviour, i.e. the choice of a particular action (why), persistence (how long), and effort (how hard). Such conceptualization is different from self-determination theory (Deci and Ryan, 1995). According to self-determination theory, the goal is to facilitate more high-quality autonomous motivation so that learners are willing to use the new language to interact and learn without requiring constant effort from the teacher. Motivation is distinguished as intrinsic and extrinsic motivation (Deci and Ryan, 1995). The former involves doing something because it is inherently satisfying, while the latter means doing something to attain external rewards, pressures, and expectations.

The role of extrinsic motivation has received sufficient attention in L2 learning (Noels et al., 2000). In particular, extrinsic motivation, based on the level of autonomy, can be further categorized as identified, introjected, or external regulation. Identified regulation is the most autonomous behaviour. It is for a learner to achieve an end that affects his or her personal well-being, desires, and values. For example, a learner simply recognizes that learning a language is beneficial for his/her development and adopts that behaviour as his or her own. Introjected regulation is from an internalized, pressuring voice. Introjected regulation inspires a learner to enact a behaviour not because he or she wants to, but because of fear or guilt in not doing it. An example of introjected regulation is that a student does not find enjoyment in online English learning activities but he or she attends the activities through fear of obtaining a negative effect in later studies or the negative reaction from classmates, teachers, or parents. External regulation is the least autonomous behaviour. External regulation is for a more immediate reward, pressures, or expectations, for example, learning a language to get a well-paying job or to pass exams. The role of intrinsic motivation has also received sufficient attention in L2 learning (Noels et al., 2000). Intrinsic motivation is inspired solely by a learner's interest and enjoyment in an activity. For instance, if a student feels motivated to participate in remote English learning and his motivation stems from the joy or interest in those online English learning activities, rather than the promise of an exam or any other influence, then his or her motivation is intrinsic. Intrinsic motivation is essential to the cultivation of self-regulated learning. It also encourages a sense of autonomy in language learning (Teng, 2019).

The importance of motivation in remote learning has received sufficient attention. Studies have suggested a positive relationship between learner motivation and remote learning performance as remote learning has a unique motivational affordance that allows learners to select learning modules and segments based on their needs and interests (Cho and Heron, 2015). In addition, Barak et al. (2016) maintain that interactions in the remote learning mode are highly conducive to motivation. Such a statement highlights the need to provide learners with chances to interact with other learners by posing questions and commenting on others' questions. However, online learning may also be synchronous, meaning that students generally have no choices in terms of skipping or replaying the course content. In the meantime, the extent of interactions depends on the instructor's learning design, which may not afford sufficient peer or learner-teacher interactions. Thus, this remote learning mode requires greater determination, learner autonomy, and learning motivation (Teng, 2019). Despite the importance of language learning motivation in remote learning, little research has paid attention to learners' extrinsic and intrinsic motivation in remote learning (Lin et al., 2017). Learners' motivation is a combination of intrinsic and extrinsic factors. For example, Wang (2008) pointed out that extrinsic motivation was positively correlated with intrinsic motivation, and co-influence Chinese EFL learners' English learning achievement. In addition, language learning motivation has not been considered in relation to metacognitive strategies in the context of remote learning.

Metacognitive Strategies

Researchers increasingly pay attention to how metacognition influences language learning and teaching (Chamot, 2005). Flavell (1976: 232) defines metacognition as 'one's

knowledge concerning one's own cognitive processes and products or anything related to them'. Metacognition includes metacognitive knowledge, metacognitive experiences, and metacognitive strategies. The present study focussed on metacognitive strategies, which involve the deliberate use of strategies to control one's own cognition. The activation of learners' metacognitive strategies is a prerequisite for learners to reflect on what they know and want to learn and to expand their own involvement in setting goals for the monitoring and evaluating of their language learning process, especially for EFL writing (Teng & Huang, 2019; Teng, 2020).

Metacognitive strategies are the key to online self-regulated learning. Self-direction refers to the processes by which learners plan, monitor, and evaluate their learning processes. The demands of a self-directed remote learning context require students to reevaluate their role(s) and responsibilities as autonomous learners. The self-reflection process requires a comparatively higher degree of metacognitive knowledge, i.e. people, tasks, and strategies (Schraw, 2007). However, adopting metacognitive strategies for remote English learning is challenging for EFL learners. For example, Hurd et al. (2001) highlighted the dilemma for learners in a distance language learning context: first, learners must determine the appropriate strategies by trial and error; second, they must evaluate their strengths and weaknesses in distance learning. In that study, learners were found to lack knowledge about their own perceptions, attitudes, and abilities. The dilemmas in the remote language learning context highlight a need to adopt metacognitive strategies to direct and regulate cognitive, motivational, and behavioural processes to improve language learning outcomes.

Metacognitive strategies are crucial in improving the quality of online learning. Scholars such as Huang et al. (2009) suggest that by making good use of metacognitive strategies students are able to reflect on their learning progress, identify learning challenges, and therefore look for different ways to cope with these challenges. Studies have also pointed to the importance of metacognition in enhancing online learner motivation. By investigating the effect of hypertexts in enhancing reading comprehension, Shang (2016), for example, discovered that online metacognitive strategies are a strong indicator of students' learning motivation, which further influences student online reading performances. However, self-regulation in a remote learning context is highly influenced by the complex nature of a task, the actual situation (e.g. lack of interaction), and individual characteristics (e.g. confidence), leading to varying learning outcomes (Lehmann et al., 2014). That said, metacognitive strategies may play a mediating role between self-efficacy belief and English learning achievement. This assumption requires further research.

Self-Efficacy Belief

With the growth of remote learning, it is increasingly important to consider learners' self-efficacy belief as a predictor of success in remote English learning. Self-efficacy belief, derived from social cognitive theory, has attracted much research attention in online learning environments in recent years (e.g. Alqurashi, 2016). Self-efficacy belief refers to a multidimensional thinking process consisting of individuals' beliefs, confidence, and expectations (Bandura, 1997). How people feel, think, and motivate themselves affects their ability to accomplish specific tasks (Bandura, 1997), e.g. writing (Kong & Teng, 2020). Learners' self-efficacy beliefs determine their confidence in managing

their strategic learning and influence their understanding of psychological development (Dörnyei and Ryan, 2015). In the field of L2 learning, self-efficacy beliefs impact a language learner's competence in activating and maintaining cognition, emotions, and behaviours to attain their academic learning goals (Lin et al., 2017). For example, a strong self-efficacy belief determines learners' transformation from learners' mental ability to task-related skills in language learning because an efficacious outlook may lead to reduced stress, lower vulnerability, and better accomplishments (Wang & Pape, 2007).

Self-efficacy beliefs are context-specific. In online virtual learning, Shen et al. (2013) suggested the importance of self-efficacy belief due to the lack of interactions and more distractions when compared with a teacher-fronted classroom. Learners may face great psychical and psychological challenges for remote learning. In responding to the challenges, learners need stronger self-efficacy beliefs in online learning. Moreover, Shen et al. (2013) commented that self-efficacy in online learning should be carefully considered from three perspectives: technology (e.g. students' perceptions of their ability to use Zoom effectively for distance learning), learning (e.g. students believe that they are able to gain learning progress with the online mode of learning), and social interaction (e.g. students with high willingness to interact with their peers during online lectures).

Previous studies have also suggested the importance of self-efficacy beliefs in remote learning. For example, learners with low self-efficacy belief in remote learning may be less likely to engage in online learning due to a lack of confidence (Kuo et al., 2014). The low level of self-efficacy belief may also decrease learners' motivation to continue in online learning. Kuo et al. (2014) thus argued that learners' self-efficacy belief influences their motivation, as well as learning outcomes. One reason may be that learners with high self-efficacy belief think online learning environments could help them adopt relevant metacognitive strategies to explore and elaborate knowledge through online learning activities. In addition, learners with higher self-efficacy belief can be more motivated to perform online learning tasks and participate in collaborative online activities (Lin et al., 2017). Given learners' individual differences in self-efficacy beliefs, e.g. learners may differ substantially in their online learning experiences and capabilities, it appears essential to explore EFL students' self-efficacy belief in remote English learning.

Hypothesized Model and Research Questions

The present study examines a proposed model for students' English learning performance in a remote learning setting that involves metacognitive strategies, self-efficacy belief, and language learning motivation. Although previous studies indicate that self-efficacy belief is a critical predictor of online learning outcomes (Lin et al., 2017) and satisfaction (Shen et al., 2013), the literature does not indicate how metacognitive strategies and language learning motivation best mediate the effects of self-efficacy belief on students' learning outcomes. Given the low volume of studies and the importance of these issues, an extension of existing research is needed to assess the relationships among metacognitive strategies, self-efficacy belief, language learning motivation, and English learning outcome in remote learning. We hypothesized the following model to delineate the relationship between the four variables (Figure 1). First, self-efficacy belief is a main predictor of students' English learning achievements. Second, we are interested in exploring the mediating effect of two additional variables – metacognitive strategies and language
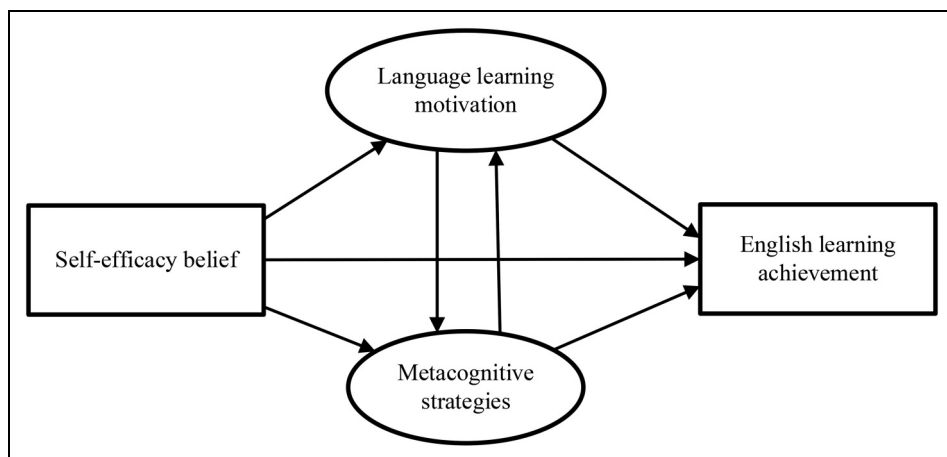
Figure 1. The hypothesized model on metacognitive strategies, self-efficacy belief, language learning motivation, and English learning achievement.

learning motivation – on the effects of self-efficacy belief in English learning achievement.

The present study aims to answer two research questions:

1) How does self-efficacy predict students' English learning achievement?
2) How do metacognitive strategies and language learning motivation mediate the predictive effect of self-efficacy belief on students' English learning achievement?

Method

Participants

The present study focussed on university students in mainland China. Invitations were sent to potential students via their instructors. All the potential participants were enrolled in a university online English course. At the time the study was conducted, the COVID-19 pandemic was severe and classroom instruction was mostly done through the online mode. In total, 620 students completed the survey. We included valid data from 590 students for analysis. Based on the demographic information part of the survey, their mean age was 19.3 (SD = 1.2). Among them, 304 were men and 286 were women. Among them, 298 were first-year students and 292 were second-year students.

Measures

The measures in the present study include metacognitive strategies, language learning motivation, self-efficacy belief, and English learning achievement. All survey items were assessed through a seven-point Likert scale, ranging from 1 'not at all true of me', to 7 'very true of me'. Exploratory factor analysis (EFA) was run to understand

the factor structure and reliability of the three surveys. The factor loadings were all higher than 0.5, showing acceptable effect sizes (Blunch, 2008). The reliability and validity of the four measures are presented in the results section.

Metacognitive Strategies

The assessment of metacognitive strategies for online learning was adapted from the Online Self-Regulated Learning Questionnaire (OSLQ) developed by Barnard et al. (2009). The previous OSLQ was a 24-item scale survey. The present study included 14 items that purposefully reflect metacognitive strategies, i.e. goal setting (four items), task strategies (four items), help seeking (three items), and self-evaluation (three items). The items were rephrased to be more appropriate for the remote English learning situation.

Language Learning Motivation

The assessment of language learning motivation includes two types of motivation, intrinsic and extrinsic, which were adapted from Noels et al. (2000). The items were revised to reflect the remote English learning situation. Intrinsic motivation was measured via three subconstructs: knowledge (three items, e.g. I study the target language because I enjoy the feeling of acquiring knowledge about the online language learning community and their way of life); accomplishment (three items, e.g. I study the target language for the satisfaction I feel when I am in the process of accomplishing different online language learning exercises); and stimulation (three items, e.g. I study the target language for the pleasure I get from hearing the second language spoken by my classmates in the online course).

The assessment of extrinsic motivation also includes three subsets of extrinsic motivation in language learning: identified regulation (three items, e.g. I study the target language because I think it is good for my future development); introjected regulation (three items, e.g. I study the target language to show myself that I would not feel worried because learning and speaking a second language still has its own value); and external regulation (three items, e.g. I study the target language in order to get a more prestigious job later on).

Self-Efficacy Belief

Self-efficacy belief was assessed using a 10-item measure adapted from the online learning self-efficacy scale developed by Zimmerman and Kulikowich (2016). The original scale includes 22 items. The present study focussed on 10 items and the items were revised to uncover personal confidence or self-belief in competence in remote English learning. A sample item is 'I can learn to use a new type of technology or tool for language learning efficiently'.

English Learning Achievement

English learning achievement was assessed through the standardized English test in the school. This test was co-developed by all English teachers in the university. This test was

a uniform test for all students in the experimented university. This test was administered online through the test system. This test included the assessment of listening, grammar structure, vocabulary, reading, and writing. The maximum score for this test was 100 points. Based on the teachers, the test items adequately and representatively sample the content area, i.e. reading, listening, writing, and grammar. This test thus has content validity. Those were evidence for the rigour and trustworthiness of this test.

Data Analysis

Structural Equation Modelling (SEM) was used to investigate the structural relationships among self-efficacy belief, metacognitive strategies, and motivation, as well as their possible impact on English learning achievement. Statistical indices related to the degree of fitness of the model included: the chi-square goodness-of-fit (χ2), the root mean square error of approximation (RMSEA), normed fit index (NFI), relative fit index (RFI), Tucker-Lewis index (TLI), and the comparative fit index (CFI). A value of IFI, TLI, and CFI larger than 0.9 and an RMSEA smaller than 0.08 are considered to indicate an adequate model fit (Hu and Bentler, 1999). The data analyses were performed through Mplus.

Results

Descriptive Statistics

Table 1 presents the descriptive statistics of students' responses to the questionnaires.

Based on Table 1, the participants' English learning achievements were moderate ($M = 66.81$). The students reported moderate levels of language learning motivation ($M = 4.40$), metacognitive strategies ($M = 4.43$), and self-efficacy belief ($M = 4.39$). The values of skewness and kurtosis showed a reasonable distribution and symmetry of the data. The Cronbach's alpha demonstrated the internal consistency and reliability of the four measures.

Correlation Results

Table 2 presents the correlation results among the constructs.

Based on Table 2, metacognitive strategies were significantly correlated with language learning motivation ($r = .772$), self-efficacy belief ($r = .681$), and English learning achievement ($r = .508$). Language learning motivation was significantly correlated with

Table 1. Descriptive statistics of constructs in the study ($n = 590$).

Variables	Mean	Std.	Skewness	Kurtosis	Cronbach's alpha
Metacognitive strategies	4.43	.69	−.146	2.697	.83
Language learning motivation	4.40	.62	−.213	3.329	.89
Self-efficacy belief	4.39	.66	.002	1.192	.87
English learning achievement	66.81	6.83	−.291	2.935	.76

Table 2. Correlation results of the variables.

	Metacognitive strategies	Language learning motivation	Self-efficacy belief
Metacognitive strategies	I		
Language learning motivation	.772**	I	
Self-efficacy belief	.681**	.777**	I
English learning achievement	.508**	.606**	.567**

Note. *$p < 0.05$, **$p < 0.01$, ***$p < 0.001$.

self-efficacy belief ($r = .777$) and English learning achievement ($r = .606$). Again, self-efficacy belief was significantly correlated with English learning achievement ($r = .567$).

SEM Results

Table 3 presents the goodness-of-fit indices for the models.

Based on the values of RMSEA, NFI, RFI, IFI, TLI, and CFI in Table 3, the four SEM models fit the data. The details of the four models are listed as follows.

Model 1. Model 1 presents the mediating role of language learning motivation in the effects of self-efficacy belief on English learning achievement (Figure 2). In particular,

Table 3. Goodness-of-Fit indices for the models.

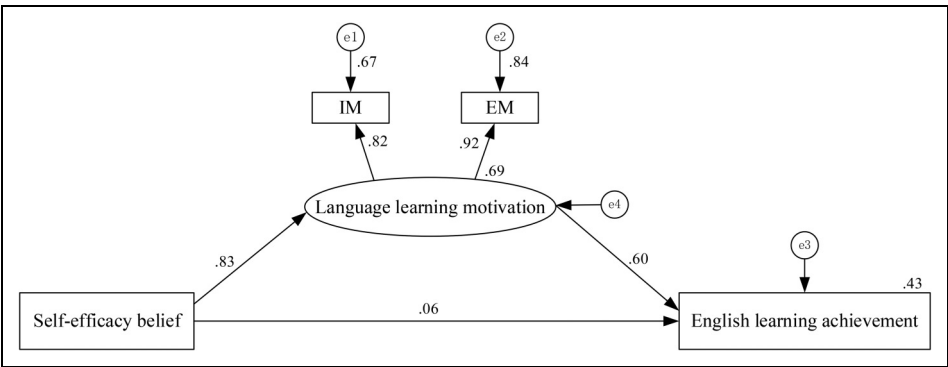| Models	χ^2/df	RMSEA	NFI	RFI	IFI	TLI	CFI
SEM 1	2.377	.047	.998	.983	.999	.990	.999
SEM 2	8.571	.110	.963	.903	.967	.914	.967
SEM 3	6.116	.090	.970	.932	.975	.943	.974
SEM 4	6.116	.090	.970	.932	.975	.943	.974

Figure 2. The mediating role of language learning motivation on self-efficacy belief and English learning achievement.

Table 4. Path coefficients of model 1.

Path			Estimate	S.E.	C.R.	p	Standard coefficient
LLM	<—	SEB	.652	.028	23.662	***	.833
English learning achievement	<—	LLM	7.917	.992	7.978	***	.604
English learning achievement	<—	SEB	.647	.727	.890	.374	.063

Note. LLM = Language learning motivation; SEB = Self-efficacy belief.

self-efficacy belief predicts language learning motivation (β = .833, p < .001). Language learning motivation predicts students' English learning achievement (β = .604, p < .001) (Table 4).

Model 2. Model 2 presents the mediating role of metacognitive strategies on the effects of self-efficacy belief on English learning achievement (Figure 3). In particular, self-efficacy belief predicts metacognitive strategies (β = .729, p < .001). Metacognitive strategies (β = .298, p < .001) and self-efficacy belief (β = .351, p < .001) predict students' English learning achievement (Table 5).

Model 3. Model 3 presents the mediating role of metacognitive strategies and language learning motivation in the effects of self-efficacy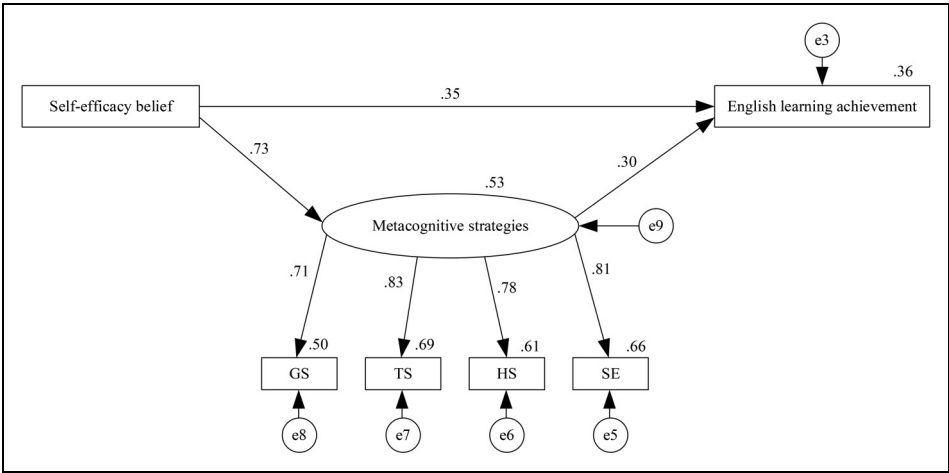 belief on English learning achievement (Figure 4). In particular, self-efficacy belief predicts language learning motivation (β = .404, p < .001) and metacognitive strategies (β = .730, p < .001). Metacognitive strategies predict language learning motivation (β = .598, p < .001). Language learning motivation predicts students' English learning achievement (β = .771, p < .001) (Table 6).

Model 4. Model 4 presents the mediating role of metacognitive strategies and language learning motivation in the effects of self-efficacy belief on English learning achievement

Figure 3. The mediating role of metacognitive strategies on self-efficacy belief and English learning achievement.
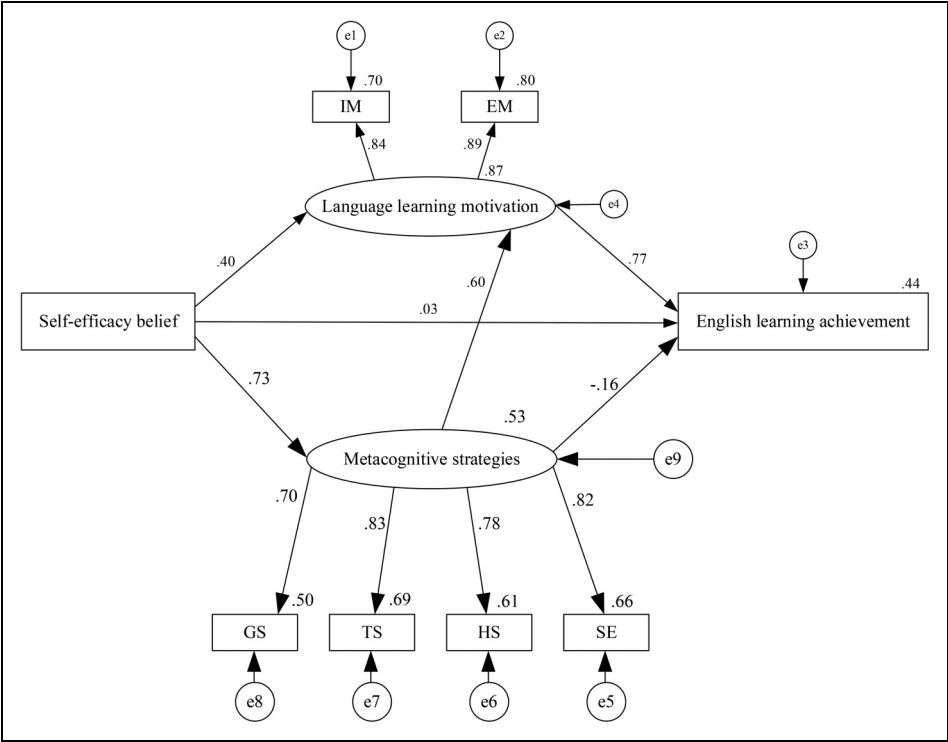
Figure 4. The mediating role of metacognitive strategies and motivation on self-efficacy belief and English learning achievement.

(Figure 5). The difference of Model 3 lies in the predicted effects of language learning motivation on metacognitive strategies. In particular, self-efficacy belief predicts language learning motivation ($\beta = .840$, $p < .001$) but not metacognitive strategies ($\beta = -.068$, $p = .320$). Language learning motivation predicts metacognitive strategies ($\beta = .950$, $p < .001$). Language learning motivation predicts students' English learning achievement ($\beta = .771$, $p < .001$) (Table 7).

Discussion

The strengths of the study include the large sample size, prospective design, the use of representative data validated scales for self-efficacy belief, metacognitive strategies, language

Table 5. Path coefficients of model 2.

Path			Estimate	S.E.	C.R.	p	Standardized coefficient
MS	<—	SEB	.769	.039	19.635	***	.729
English learning achievement	<—	SEB	3.609	.540	6.682	***	.351
English learning achievement	<—	MS	2.900	.550	5.269	***	.298

Note. LLM = Language learning motivation; SEB = Self-efficacy belief; MS = Metacognitive strategies.

Table 6. Path coefficients of model 3.

Path			Estimate	S.E.	C.R.	P	Standardized coefficient
MS	<—	SEB	.774	.039	19.888	***	.730
LLM	<—	SEB	.324	.031	10.476	***	.404
LLM	<—	MS	.452	.034	13.220	***	.598
English learning achievement	<—	LLM	9.862	2.172	4.540	***	.771
English learning achievement	<—	SEB	.345	.824	.419	.676	.034
English learning achievement	<—	MS	−1.522	1.207	−1.261	.207	−.157

learning motivation, and English learning achievement. The purpose was to identify the four variables under the remote English language learning setting. The findings yielded major findings: self-efficacy belief predicts English learning achievement. Language learning motivation and metacognitive strategies mediate the role of self-efficacy beliefs in English learning achievement. By revealing the correlation among self-efficacy belief, meta-cognitive strategies, and motivation in remote learning, the present study proposes a pro-active agentic framework of highlighting self-efficacy belief in English learning achievement. The following sections focussed on the discussion of findings, with relevance
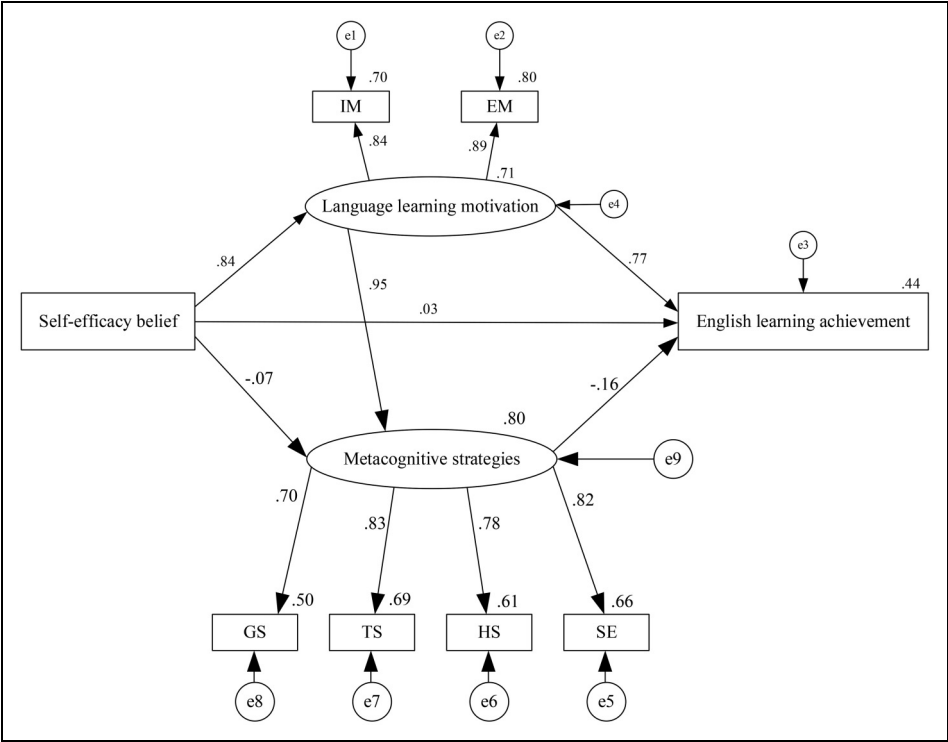

Figure 5. Metacognitive strategies, motivation, self-efficacy belief, and English learning achievement.

Table 7. Path coefficients of model 4.

Path			Estimate	S.E.	C.R.	p	Standardized coefficient
LLM	<—	SEB	.674	.026	25.705	***	.840
MS	<—	SEB	−.073	.073	−.995	.320	−.068
MS	<—	LLM	1.256	.106	11.817	***	.950
English learning achievement	<—	LLM	9.862	2.172	4.540	***	.771
English learning achievement	<—	SEB	.345	.824	.419	.676	.034
English learning achievement	<—	MS	−1.522	1.207	−1.261	.207	−.157

to theories of self-efficacy beliefs, metacognitive strategies, and language learning motivation.

Self-Efficacy Belief in English Learning Performance

The present study highlights the positive effects of self-efficacy belief on individuals' English learning achievement under remote learning situations. Although self-efficacy belief did not predict students' English learning achievement in the first model, which included only language learning motivation, results suggest that self-efficacy belief did predict the students' English learning achievement in the other three models. Conforming to the previous studies (e.g. Chao et al., 2018; Kuo et al., 2014; Shen et al., 2013), self-efficacy belief acts as a sub-personal aspect that orchestrates individuals' courses of action in facing inherent challenges related to remote learning. Based on the findings, we argue that learners with strong efficacy beliefs were more likely to exert effort when encountering difficulties in remote learning. In contrast, those who have weaker perceptions of efficacy were less likely to achieve better English learning achievement and they might be plagued by self-doubts (e.g. '"I cannot complete a group project for language learning online"') and give up easily when confronted with difficulties, even if they had intended to perform the task. Such findings were in line with Kong and Tang (2020). Although Kong and Teng (2020) focussed on offline writing settings, it appears that students who want to succeed in online learning should have confidence in remote English learning.

In our hypothesized framework, self-efficacy belief helps learners obtain information and facilitates the purposive use of information in regulating learning behaviours or orchestrating actions for learning (Benight and Bandura, 2004). One explanation may be that strengthened self-efficacy belief decreases the sense of worry and anxiety (Tahmassian and Moghadam, 2011), highlighting the role of self-efficacy belief in enhancing confidence in competence or chances for a favourable outcome, especially in responding to the remote learning setting.

Enlightened by the findings that self-efficacy belief was a significant predictor of English learning achievement, students who felt strongly competent in specific English learning felt more efficacious in English learning (Wang & Pape, 2007). The results further demonstrate that the learning context is a mediator between self-belief in one domain and English learning achievements in another domain (Chao et al., 2018). In earlier studies (Bandura, 1997), a strong sense of efficacy enhances

personal wellbeing and accomplishment in academic learning. Therefore, self-efficacy belief may help individuals manage symptoms, such as depression, anxiety, and worry, thus enhancing their coping capabilities to maintain competence in remote English learning.

The Joint Mediating Role of Motivation and Metacognitive Strategies

The findings suggest that the variable of motivation, including intrinsic or extrinsic motivation, significantly predicted online English learning outcomes. The findings stand in contrast to those of the previous work, wherein motivation did not impact online learning outcomes in higher education (Lin et al., 2017). The findings support previous work in highlighting the role of motivation in online English learning (Zheng et al., 2018). One explanation was that students in online language courses who exhibited high motivation might hold favourable views on this new type of learning and thus would be more likely to engage in online English learning tasks. In the present study, the students lacked motivation for the remote learning mode and they may have been less confident in studying English in an online setting. This may explain why the English learning achievement was not satisfactory.

One explanation for why learners with high self-efficacy belief were more likely to achieve better English learning outcomes may be because self-efficacy belief is related to motivational constructs, including extrinsic and intrinsic motivation (Lin et al., 2017). According to the self-efficacy theory and research (Bandura, 1997), we might argue that learners who develop a sense of competence or efficacy in remote English learning may be more motivated to seek better learning outcomes. It is possible to state that self-efficacy is positively related to adaptive motivational beliefs. Within the motivation theory and research (Noels et al., 2000), there is a debate over the relative causal ordering of self-efficacy and motivation. However, our findings suggest that it is more important to note that there is a reciprocal relationship between self-efficacy belief and motivation. Future research should be focussed on how self-efficacy belief and motivation work together to influence students' English learning achievement. Students in online language courses often exhibited low motivation for learning English due to the lack of support (Barak et al., 2016). Considering the reciprocal relationship between self-efficacy belief and motivation, it is essential to more deeply examine learners' self-efficacy belief and motivation to learn English in a remote English learning setting. The present study also demonstrated that online language learners can adopt metacognitive strategies to understand their learning and can make active use of strategies to enhance their achievement in English learning. The findings regarding metacognitive strategies in an online setting are consistent with those of previous metacognitive strategy research conducted in offline writing contexts (e.g. Teng & Huang, 2019). These results provide evidence for the importance of metacognitive strategies, such as planning, goal-setting, self-evaluation, and information organizing, in remote English learning. As argued by Zimmerman (2008), self-regulated learners need to plan, set goals for, organize, seek helpful resources for, monitor and evaluate their learning to improve their knowledge acquisition. Contributing to the previous studies (Lin et al., 2017; Zheng et al., 2018), the present study further explains the joint mediating role of motivation and metacognitive strategies in online English learning. Students'

motivations in learning English online allow them to be more self-determined and consequently to adopt metacognitive strategies to be independent of teachers and others.

In the present study, learners with high self-efficacy beliefs were better able to achieve better English learning outcomes. One reason could be related to the increase in the use of deeper processing strategies such as metacognitive strategies (Lehmann et al., 2014). Learners who were confident in their skills were much more likely to try to understand their remote learning requirements and think deeply about them. They were more metacognitive, e.g. they were more likely to plan, monitor, and evaluate themselves while responding to remote learning demands. Considering the mediating role of metacognitive strategies in the effects of self-efficacy belief on English learning outcomes, we do not aim to challenge the predictive power of self-efficacy belief on learning. Rather, we suggest that the low levels of metacognitive strategies exhibited by our participants hindered their self-efficacy belief in online English learning. Since self-efficacy belief for the remote learning mode might be associated with metacognitive strategies, we recommend that future studies pay special attention to students' use of metacognitive strategies, and examine the extent to which its variance may influence learners' self-efficacy belief in remote English learning.

Concluding Remarks

The present study supports the interconnection between self-efficacy belief, metacognitive strategies, language learning motivation, and English learning achievement in the remote learning situation. The present study also supports language learning motivation and metacognitive strategies mediate the role of self-efficacy beliefs on English learning achievement. There are some limitations. First, we did not measure learners' anxiety. Future studies can focus on students' anxiety level, and how anxiety mediates the self-efficacy belief and English learning achievement. Second, future studies should explore differences in perceptions of self-efficacy belief, metacognitive strategies, and motivation in a longitudinal method. Third, qualitative data can be triangulated with quantitative data to understand individual differences in responding to the remote English learning situation. Finally, to what extent the results may be generalizable depends on how representative the precise remote learning delivery format these students experienced. Further research on other L2 learning contexts is warranted.

Despite limitations, the present study is innovative in exploring self-efficacy belief, metacognitive strategies, and motivation in the context of remote English language learning. Remote learning – with little training, insufficient support, and little preparation – may result in a negative learning experience that is unconducive to sustained language development. First, it is salient to ensure the students' learning belief is a positive one, by cultivating a positive teaching and learning online environment. As the research has shown, learners are motivated to engage in remote English learning achieved better learning outcomes. Teachers should provide feedback to help learners develop reasonable efficacy beliefs. This type of feedback should be tailored to the needs of remote English learning. Second, the present study expands the knowledge base concerning the nature of self-efficacy belief, and its dynamic relationships with metacognitive strategies and online language learning motivation. Students' metacognitive strategies and motivation mediate the relationship between self-efficacy belief and

English learning achievement. Students who feel more competent in the learning process may regulate with their self-regulated strategies and metacognitive skills to cope with the challenges in remote English learning. This is one reason why better levels of metacognitive strategies, motivation, and self-efficacy belief could lead to better English learning achievement. Language instructors and teacher educators should try to configure more psychological treatment sessions to promote students' self-efficacy belief, metacognitive awareness, and motivation in helping them adapt to the remote learning environment. Future studies are needed to address various learner needs and support for metacognitive awareness, self-efficacy, and motivation for remote English learning.

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