



Predictors of Engagement and Success in a Flipped EFL Classroom in China

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Abstract

The present study adopted a predictive-correlational design to explore whether self-reported motivated strategies for learning and language-learning strategies of Chinese EFL learners ($N = 97$) were associated with the following: (a) engagement with a learning management system (LMS), (b) engagement with flipped-classroom materials, and (c) final grades in a flipped EFL course. The Motivated Strategies for Learning Questionnaire (MSLQ) and the Strategy Inventory for Language Learning (SILL) were administered to sophomore-level English writing students in a cross-border higher education setting in the Henan province of China; predictor variables were then explored for association with end-of-term criterion variables operationalized by behavioral and performance data. Results indicated that the MSLQ and SILL failed to predict engagement or success with flipped classroom materials. Instead, the amount of time learners actually spent engaging with flipped materials was significantly, positively associated with student success measured by final grades.

1 Introduction

With Google for Education, Bring Your Own Device, flipped classrooms, and other trends of increasingly blended learning environments, the problem of motivating students to get online to study at home still represents a central concern (Hall & Dufrene, 2016; Webb, Doman, & Pusey, 2014). Models such as flipped classrooms employing pre-class asynchronous activities rely on students doing the homework to capitalize on meaningful two-way communication and practice in the classroom (O’Flaherty & Phillips, 2015), so, as always, motivated action remains an important variable to consider whether learning happens face to face or online.

Numerous studies on blended and flipped classrooms have adopted quasi-experimental designs that have robustly supported the value of these models. These studies show that learners engaging with flipped materials have reported positive attitudes toward the flipped model and have performed as well as or at times better than participants engaging with more traditional, classroom-contained instruction: in accounting (Phillips & Trainor, 2014), in algebra (Love, Hodge, Grandgenett, & Swift, 2014; Talbert, 2014), in biology (Seyedmonir, Barry, & Seyedmonir, 2014), in business (Rajaram, 2019), in education (Vaughan, 2014), in engineering (Kim, Kim, Khera, & Getman, 2014; Mason, Shuman, & Cook, 2013), in health professions (McLaughlin et al., 2014), in history (Gaughan, 2014), in multimedia (Enfield, 2013), in pharmacy (Pierce & Fox, 2012; See & Conry, 2014), in physiology (Tune, Sturek, & Basile, 2013), in psychology (Talley & Scherer, 2013), in science (Lasry, Dugdale, & Charles, 2014; Herreid & Schiller, 2013), in social studies and humanities (Kim, Kim, Khera, & Getman, 2014), in statistics (Strayer, 2012), with at-risk learners (Flumerfelt & Green, 2013), and so on.

In spite of the number of studies appearing in recent years, many rely on self-reported attitudes toward flipped classrooms, with less attention being paid to how much and why or why not learners engage with pre-class flipped materials (O'Flaherty & Phillips, 2015). As a result, a gap exists in our knowledge on flipped classrooms in general, and in our knowledge of how English-as-a-foreign-language (EFL) learners' motivated behavior interacts with engagement with blended and flipped classroom materials.

The need exists to further understand relationships between self-reported motivation of EFL learners in flipped, blended classrooms and both the effort and the performance in such classes. Research that reliably predicts which learner differences lead to ideal and less-than-ideal effort and performance could benefit teachers, administrators, and researchers. For instance, teachers could learn which students remain at risk for test anxiety and lower overall motivation to learn English. Teachers may then take measures to attempt to make instruction meaningful to those particular learners, and already-motivated learners may not warrant as much concern. Meanwhile, administrators could green-light the building of courses in Chinese EFL contexts that work to instill motivation, such as smaller student-centered classrooms instead of lecture-style English classes that may decrease the motivation of Chinese EFL learners (Li, 2014). Finally, future research could focus not so much on *whether* flipped classrooms motivate learners but *which kinds* of flipped activities work better than others. Kim, Kim, Khera, and Getman (2014) have pointed out a dearth of research on effective design of flipped classrooms; they argued that flipped classrooms should do the following: (a) expose learners to concepts before class; (b) motivate students to prepare for class; (c) assess comprehension; (d) link at-home work with in-class activities; (e) provide clear, structured guidance; (f) allow enough time for learners to finish assignments; (g) build a community of learners; (h) deliver prompt and adaptive feedback during individual and group work; and (i) involve easy-to-use, familiar technologies (pp. 44–46). González-Lloret and Ortega (2014), too, argued for the huge benefits technology-mediated task-based learning awards students:

Tasks [that] are mediated by new technologies can help minimize students' fear of failure, embarrassment, or losing face; they can raise students' motivation to take risks and be creative while using language to make meaning; and they can enable students to meet other speakers of the language in remote locations, opening up transformative exposure to authentic language environments and cultural enactments, along with tremendous additional sources of input. (p. 4)

Finally, efforts are already underway to establish official policies on e-learning in the Asia-Pacific region, including in major Chinese cities such as Beijing, Hong Kong, and others in the Taiwan region, in which policymakers are tackling issues related to infrastructure, curriculum integration, student learning, teachers' professional development, and leadership building (Kong, Chan, Huang, & Cheah, 2014).

Though criticized for lacking applicability to EFL or Global-English contexts (Dörnyei, 2009; Oxford & Sheardin, 1994; for a review, see Dörnyei, 2005), Gardner's (1985, 2001a, 2001b) theory of motivation from a socio-educational model of second language acquisition (SLA) still seems relevant to a Chinese EFL cross-border higher education (CBHE) context. It provides researchers a number of useful, testable postulations related to learner differences that impact learners' performance and behaviors that learners tend to exhibit in classrooms. This present study sought to draw from this theory to correlate and explain learners' self-reported motivated strategies for learning and language-learning strategies to see if they significantly correlated with success in a flipped EFL class.

2 Literature review

The following review of the literature aims to underscore both a theoretical and a practical gap in our knowledge. A look at relevant motivation theory and recent work on motivation highlights that additional room exists not just to describe Chinese EFL learners but to predict behavior in flipped EFL classrooms in Chinese CBHE contexts. Next, a look at blended and flipped classroom

studies, especially those set in Asian and, specifically, Chinese contexts, uncovers a gap in our practical knowledge. Taking steps to close this gap would benefit teachers, administrators, and researchers in EFL contexts and beyond.

2.1 Motivation theory

2.1.1 Integrativeness

Integrativeness is “reflected in an integrative orientation toward learning the second language, a favourable attitude toward the language community, and an openness to other groups in general (i.e., an absence of ethnocentrism)” (Gardner, 2001b, p. 8); Dörnyei (2009) proposed that, from the L2 Motivational Self System theory of motivation, Gardner’s concept of Integrativeness played a central role in L2 motivation, “mediating the effects of all other attitudinal/motivational variables on the two criterion variables *Language choice* and *Intended effort to study the L2*” (p. 26), and that the concept of Integrativeness proved synonymous with “the L2-specific facet of one’s ideal self” (p. 27).

2.1.2 Attitudes toward the learning situation

Attitudes toward the learning situation cover any attitude “toward any aspect of the situation in which the language is learned” (Gardner, 2001b, p. 8); learners could hold such attitudes toward any aspect of the learning environment, such as toward teachers and classroom techniques, which vary among learners and contexts over time.

2.1.3 Motivation

For Gardner (2001b), motivation in a socio-educational model requires the following three elements: (a) that a learner persistently and consistently “expends effort” to learn the target language, “by doing homework, by seeking out opportunities to learn, by doing extra work, and so on” (p. 8); (b) that the learner wants and desires to learn the target language successfully; and (c) that the learner enjoys learning the target language, referring to the task as “fun, a challenge, and enjoyable” (p. 8). Gardner (2001a, 2001b) also noted that only motivated learners were likely to use language-learning strategies.

2.2 Chinese learners of English

Previous research on what motivates Chinese learners of English identified the significant impact of English as a mandatory requirement in many levels of learners’ educational experiences (Li, 2014; Liu, 2012; Ning & Hornby, 2013; Peng & Woodrow, 2010; Zhang & Guo, 2012; to name a few). Ruan (2014) found Chinese EFL writers’ previous experiences with classroom instruction might have led to attitudes of English being “imposed” upon them and, in that way, restricting spontaneous efforts to think and communicate (Liu, 2012), more so than for Chinese learners in English-as-a-second-language (ESL) contexts (Li, 2014). Chinese learners may prove more motivated to do well in English classes than to integrate into English-speaking communities (Liu, 2012). Although cooperative learning may increase Chinese learners’ intrinsic motivation (Ning & Hornby, 2013), Chinese sociocultural norms that view classroom communication as a timewasting activity may impact Chinese EFL learners’ anxiety and motivation to speak up in English class (Peng & Woodrow, 2010).

Although Chinese EFL learners with higher proficiency levels have reported lower levels of motivation (Zhang & Guo, 2012), motivation has correlated significantly with performance, with Chinese female learners tending to report higher motivation than males (Lamb, 2004; Liu, 2009, 2012; Yang, Liu, & Wu, 2010). Li (2014) concluded that Chinese EFL learners appeared more extrinsically motivated to learn English (to pass exams and to do well in class) as well as more anxious

about speaking English, with “attitudes to learning English being the most important predictor variable for the EFL learners” (p. 455); in addition, anxiety in tandem with adverse social pressure negatively impacted motivated learning behavior. Teacher-centered approaches offering fewer chances for meaningful interactions in large lecture-style English classrooms in China might have resulted in EFL learners forming less favorable attitudes toward learning English and in spending less time trying to learn it (Li, 2014).

2.3 *Blended learning*

Among the first to do so definitively, Graham (2006) defined blended learning systems as combining two historically distinct teaching models, resulting in a model that melded face-to-face instruction with computer-mediated instruction. Blended learning constitutes an instructional mode of delivery, which replaces 20-80% of face-to-face time with online work (Harrington, 2010). Harrington (2010) called for further discussion of the potential problems related to blended learning in EFL contexts, naming fractured identity development, “forced individualism” (p. 3), and a muting or stunting of learners’ academic discourse and “authorial self” (p. 5) as potential problems worthy of sustained attention.

Motivated by a lack of studies on blended learning framed by theory, Grgurović (2014) considered blended learning from the perspective of the Diffusion of Innovations theory and gathered data through interviews and observations; results included participants reporting that they saw “the value of online pronunciation, speaking, and listening activities” (p. 168). Earlier, Grgurović (2011) employed a case-study design to collect interview and observational data of ESL students in blended learning contexts; results included participants reporting that “online speaking and pronunciation activities added value to instruction because they were helpful and unique” (p. 113).

Blended learning in Asian classrooms has also received attention. Korean EFL learners self-reported that activities using wikis, blogs, and online forums in blended classrooms seemed “novel, easy, [and] fun” (Miyazoe & Anderson, 2010, p. 192). Wang (2014) pointed out the potential of deepening cultural and linguistic understanding in language classes. Still, Kang, Sung, Park, and Ahn (2009) found that low and intermediate-level EFL learners’ writing performance remained resistant to improvement as a result of engagement with online blended-learning activities.

2.4 *The flipped or inverted classroom*

Among the first to do so, Lage, Platt, and Treglia (2000) explained that inverting the classroom has meant “events that have traditionally taken place inside the classroom now take place outside the classroom and vice versa,” with the inherently student-centered delivery aiming to “provide a menu of options for the students to use in learning” (p. 32). In addition to its learner-centeredness, according to recent research, flipped classrooms may involve creativity and higher-order learning skills that promote deep learning (Sweet, Blythe, & Carpenter, 2014).

2.5 *Blended learning and flipped classrooms in China*

Although challenges pertain to introducing out-of-class blended learning, such as resistance from entrenched teacher-centered classroom expectations (Tham & Tham, 2013), research on blended learning in China has reported benefits, mostly regarding learners’ attitudes toward the blend. Wu and Liu (2013), for instance, analyzed learners’ self-reported satisfaction with blended learning in an EFL context in China, relying on survey data to determine that students mostly held positive attitudes toward blended learning. Liu (2013) also collected data from mandatory end-of-semester course evaluations from Chinese EFL learners of writing and reported that learners held positive attitudes toward the blended course.

Regarding research on flipped classrooms in China, Webb, Doman, and Pusey (2014) asked how Chinese students perceived the flip as well as how instructors viewed the approach’s effectiveness.

Participants ($N = 240$) were observed and surveyed over a fifteen-week period while teachers kept journals (Webb, Doman, & Pusey, 2014). Results indicated that, overall, Chinese learners reported positive attitudes toward flipping the classroom while instructor-perception data highlighted challenges in motivating students to engage with the pre-class materials. In another study, Doman and Webb (2017) compared the attitudes toward the learning experience, technology use, and other learner factors of students in a flipped classroom with those of students in a more traditional face-to-face class. Results of survey and interview data indicated that students in the flipped classroom reported more positive attitudes toward the English-learning experience, and also toward technology use, than did students in the non-flipped class; this suggested, the researchers concluded, that the flipped model may be becoming increasingly applicable in China as communicative approaches predominate (Doman & Webb, 2017).

The present study seeks to extend this literature on flipped English learning in China by exploring time spent engaging with pre-class asynchronous activities in a flipped approach and how it correlates with learner variables, such as motivated behavior and use of learning strategies.

2.6 Justification for the present study

Since much of the literature listed above relied only or mostly on participants' self-reported attitudes and motivation, room exists for the present study, which took into account Gardner's (1985, 2001a, 2001b) theory of motivation from a socio-educational viewpoint of SLA, in which motivation includes the three-party aspects of (a) effort, (b) desire, and (c) joy. Researchers have long understood that survey results sometimes prove to be artifacts of the measurement (Gass & Mackey, 2012; Oller & Perkins, 1978). Accomplished researchers of L2 motivation, too, have advised against "direct self-report measures" in "actual language learning contexts" since students' responses might prove unreliable (Gardner, Lalonde, & Moorcroft, 1985). The present study measured not only reported attitudes and motivation but also number of hours learners used the learning-management system (LMS) and engaged with weekly flipped materials, in order to see whether reported motivation differed from or correlated with observed behavior.

The present study specifically posed the following research question: Could the Motivated Strategies for Learning Questionnaire (MSLQ) or the Strategy Inventory for Language Learning (SILL) predict which Chinese EFL learners in a CBHE context would (a) use the course's LMS most often, (b) engage with flipped materials most often, and (c) earn the highest grades? Guided by Gardner's (1985, 2001a, 2001b) theory, it was hypothesized that the most motivated learners would not only report high levels of motivation but would also expend the most effort online.

3 Method

All interactions with participants were approved and overseen by Fort Hays State University's Institutional Review Board (IRB) and by the administration of Sias International University (郑州西亚斯学院). At all times, basic ethical principles detailed in *The Belmont Report* (1979), that is, respect for persons, beneficence, and justice, guided interactions with participants and with the data they provided after granting informed consent.

In this study, individual students formed the study's unit of analysis, with two surveys operationalizing the concepts of motivation and language-learning strategy use (the study's predictor variables). The study correlated predictor variables with the criterion variable of success in a flipped classroom, which itself was operationalized by behavioral data (time using the courses' LMS and time engaging with weekly flipped materials) and with performance data (final grades in the course). Final grades in the course were determined by student performance on three month-long writing projects. The three projects were a life narrative (25%), a persuasive opinion editorial (25%), and a report on how a company brands itself in China (25%). Attendance and class participation made up the final 25% of the final grade. Each writing project was developed in class cooperatively with the instructor, underwent peer-review, and was discussed face-to-face with the instructor before receiving a final grade.

This study took place at a rural, private Chinese university with a long-standing cross-border partnership with a primarily undergraduate-serving U.S. state university. Chinese students enrolled in the cross-border program earned bachelor's degrees from the U.S. university with face-to-face instruction from U.S. instructors living in China. Data was collected in the present study from students enrolled in Composition 2, a second college-level writing course that emphasized research writing and critical thinking about claims and evidence. Syllabi for the writing courses were identical to those used at the U.S. institution although instructors were required to have received formal TESOL training.

3.1 Participants

A version of the MSLQ and the SILL measured motivation and language-learning strategies of university students ($N = 97$) studying English Composition 2 in the CBHE context between a private college in Mainland China and a public university in midwestern United States of America. All learners were sophomores taking two additional English courses during the semester, one of them being an Oral English course that emphasized speaking and the other being a content course taught by a professor from the U.S. partner. Ages ranged from 20 to 22, and all participants spoke Mandarin. Of these participants, 54 identified as female and 43 identified as male. The study invited students from five sections taught by the same instructor who had already planned to experiment with flipping his courses for the entire semester. All participants read and signed informed-consent forms translated into Mandarin Chinese.

3.2 Instruments

3.2.1 SILL

This study employed Rebecca Oxford's (1990) 50-item Strategy Inventory for Language Learning (SILL) to understand participants' language-learning strategy use. The SILL allows for a prompted-production, introspective method of measuring learners' cognitive processes (Gass & Mackey, 2012). It uses a 5-point scale asking participants to respond to statements. Answers in this study ranged from "strongly disagree" to "strongly agree." The SILL measures both direct and indirect language-learning strategies: Direct Strategies include (a) *Memory Strategies*, such as grouping, semantic mapping, and physical response; (b) *Cognitive Strategies*, such as formally practicing with sounds and patterns, reasoning and translating, and taking notes and making summaries; and (c) *Compensation Strategies*, such as guessing intelligently, switching to the mother tongue, and using circumlocution; meanwhile, Indirect Strategies include (a) *Metacognitive Strategies*, such as delaying speech output to focus on understanding linguistic input, organizing and setting goals, and self-evaluating; (b) *Affective Strategies*, such as deep breathing or using music and laughter, making positive statements, and discussing feelings in a diary or with a friend; and (c) *Social Strategies*, such as asking for clarification or correction, cooperating with peers and more competent learners, and developing an understanding of the target culture (Oxford, 1990).

3.2.2 MSLQ

To measure motivational beliefs and strategies for self-regulated learning, this study used a 2-scale, 44-item, 7-point Motivated Strategies for Learning Questionnaire (MSLQ) modified and translated into Chinese. The MSLQ was developed by Pintrich, Smith, Garcia, and McKeachie (1993) and has been used for decades in various fields, containing "robust" coefficient alphas for the motivational scales (p. 808). The Chinese version of the MSLQ measures two scales: (a) *Motivation* (with subscales of Self-Efficacy, Intrinsic Value, and Test Anxiety) and (b) *Learning Strategy* (with subscales of Cognitive Strategy Use and Self-Regulation). Since Rao and Sachs (1999) developed a Chinese version of the 44-item MSLQ (MSLQ-CV, which is a 5-point, 44-item instrument), based on the MSLQ developed for junior high school students (JHS MSLQ, also a 5-point, 44-item

instrument), scholars have used the questionnaire with and/or modified it for Chinese participants (Lee, Yin & Zhang, 2010; Rao, Moely & Sachs, 2000; Sachs, Law, Chan & Rao, 2001), participants in Asian regions in general (Rotgans & Schmidt, 2010; Wang, 2012), and EFL learners (Chang, 2010). Because researchers using the MSLQ-CV in China found participants had trouble understanding reverse-coded items (Lee, Yin & Zhang, 2010; Rao, Moely, & Sachs, 2000; Rao & Sachs, 1999), some researchers have combined the two subscales of the learning strategy scale, then created a new scale called “methods” that contained the four reverse-coded items. Lee, Zhang, and Yin (2010), however, while determining that the MSLQ-CV contained “good construct validity” (p. 151), predicted that as curriculum reforms in China continued to stress cognitive strategies, learners would eventually learn to distinguish between memorization and understanding. Building off this prediction to measure today’s Chinese EFL learners, this study used an in-house translation of the MSLQ-CV that used all five subscales (three Motivation subscales and two Learning Strategy subscales), translating the 44-item instrument into Mandarin and changing it from a 5-point to a 7-point instrument that prompted participants to report to what degree a statement pertained to them (from “not at all true of me” to “very true of me”).

3.2.3 Blackboard and Flipped-Approach Delivery

The LMS used in this study, Blackboard also delivered flipped classroom materials. Weekly flipped materials (instructor-created videos describing a target concept, such as formatting essays following APA format or using the university library online, followed by an assignment to apply the concept to their own work in Blackboard blog or journal entries) were placed in folders. Blackboard recorded when each user opened the folder, when each user submitted weekly blog or journal entries on the target concept, and when the user closed the folder.

3.3 Data analysis

This study adopted a predictive-correlational design, meaning variables of motivation and strategy use were considered to understand if that helped explain the presence of outcomes (Creswell, 2012), such as time spent engaging with flipped materials and the final grades students received at the end of the course. SPSS Statistics Version 21 was used to run one-way ANOVA tests to see if motivation and strategy reporting differed among participants based on self-identified gender and on students’ semester final scores (A = 100-90 points out of 100; B = 89-80 points out of 100; lower than B = 79 points and lower). Since few students scored below a C (69 points and under), grades were grouped into these three categories for efficiency of the design and for more equal-sized groupings. Next, after the checking of core assumptions, *t*-tests checked for significant difference between participants self-identifying as female and male. Pearson correlation coefficients were then used to explore any significant relation between predictor variables (survey data on motivation and language-learning strategies) and the criterion variable of success in the flipped classroom (how much time learners used the LMS, how much time learners engaged with flipped materials, and how many percentage points learners earned in the course). Finally, multiple regression analyses explored whether subscales together impacted behavior and performance in the flipped EFL classroom.

4 Results

Descriptive statistics show the medians, mean scores, and standard deviations of the measurements collected (see Table 1 below).

Table 1. Descriptive Statistics

	Min.	Max.	<i>Mdn</i>	<i>M</i>	<i>SD</i>
MSLQ: Motivation (7-point)					
Self-Efficacy	2.67	7.00	5.25	5.25	.78
Intrinsic Value	2.89	7.00	5.68	5.68	.79
Test Anxiety	1.00	7.00	3.75	3.75	1.26
MSLQ: Strategy use (7-point)					
Cognitive Strategy Use	2.33	7.00	5.19	5.17	.83
Self-Regulation	2.10	5.80	4.30	4.30	.63
SILL: Direct (5-point)					
Memory	1.89	5.00	3.78	3.76	.518
Cognitive	2.64	5.00	3.93	3.90	.50
Compensation	2.50	5.00	3.83	3.82	.50
SILL: Indirect (5-point)					
Metacognitive	2.89	5.00	4.00	4.05	.47
Affective	2.17	5.00	3.67	3.77	.55
Social	2.67	5.00	4.00	4.04	.56
Hours on LMS	39.88	708.20	250.25	246.08	98.98
Hours in Flip	.43	37.83	11.63	14.25	8.77
Final Score	61.05	94.10	81.30	79.56	7.09

MSLQ results indicated that Chinese EFL learners reported mild levels of Test Anxiety ($Mdn = 3.75/7.00$) with high levels of Intrinsic Value ($Mdn = 5.68/7.00$) as well as Self-Efficacy ($Mdn = 5.25/7.00$), demonstrating self-reports of high motivation. Learners reported using Cognitive Learning Strategies ($Mdn = 5.17/7.00$) but had less enthusiastic feelings toward Self-Regulation ($Mdn = 4.30/7.00$). Meanwhile, SILL results indicated that Chinese EFL learners reported high usage of direct and indirect language-learning strategies ($M = 3.89/5.00$), favoring Metacognitive ($Mdn = 4.00/5.00$) and Social strategies ($Mdn = 4.00/5.00$).

On average, learners used the LMS 246 hours over the 15-week semester, learners engaged with weekly flipped materials 14.25 hours over the 15 weeks, and learners had a class average final score of 79.56 out of 100 possible points.

4.1 Was gender a factor?

Analyses checked to see whether participants who self-identified as female Chinese EFL learners differed from those self-identifying as male Chinese EFL learners. While independent-sample t -tests indicated no significant difference between the number of hours females and males used the LMS and engaged with flipped materials, a significant difference appeared between females' final scores ($M = 82.28$, $SD = 5.77$) and males' final scores ($M = 76.14$, $SD = 7.16$); $t(80) = 4.6$, $p < .001$. No other significant difference appeared between females and males in any of the scales or subscales of the MSLQ or SILL ($p > .05$).

4.2 Motivation and strategy use based on grades of A, B, and lower Than B

One-way ANOVA tests separating MSLQ results by learners' grade levels (A = 100-90 points out of 100; B = 89-80 points; lower than B = 79 and under) showed significant difference in the area of Self-Efficacy ($p = .046$). Post hoc comparisons were then used to identify which groups differed from one another. Specifically, post-hoc Tukey HSD tests indicated that the mean score of the less-than-B group ($M = 5.03$, $SD = .83$) proved significantly ($p = .036$) lower than the mean score of the B group ($M = 5.40$, $SD = .72$). The less-than-B group, however, did not differ significantly from the A group in terms of reported Self-Efficacy ($p > .05$).

One-way ANOVA tests separating SILL results by learners' scores (A, B, and lower than B) showed no significant difference in reported language-learning strategy use ($p > .05$).

4.3 LMS use and flip time based on grades of A, B, and lower than B

One-way ANOVA tests analyzing final number of hours learners used the LMS and final number of hours learners engaged with weekly flipped materials showed a statistically highly significant difference between A students, B students, and lower-than-B students ($p < .001$). Post hoc comparisons using the Tukey HSD test indicated that the mean score of the A group ($M = 25.83$, $SD = 9.63$) proved significantly ($p = .01$) greater than that of the B group ($M = 15.46$, $SD = 8.83$) and highly significantly ($p < .001$) greater than the less-than-B group ($M = 10.98$, $SD = 6.63$).

4.4 Did the MSLQ predict engagement and success in a flipped classroom?

Pearson correlation coefficients were used to determine if a statistically significant relation existed between learners' self-reported motivated strategy use and behavioral and performance outcomes in a flipped EFL classroom (see Table 2 below). Based on the results, Self-Efficacy correlated with final scores in the flipped classroom ($r = .22$, $N = 97$, $p = .03$), a small effect size according to Cohen (1988). Though the size of this coefficient may be useful simply to explore interrelations between the two variables, the coefficient cannot be used to make predictions (Creswell, 2012).

Table 2. Pearson Correlation Coefficients for MSLQ Results

<i>MSLQ and Outcomes</i>	1	2	3	4	5	6	7	8	9
1. Self-efficacy	—								
2. Intrinsic Value	.74**	—							
3. Test Anxiety	-.32**	-.04	—						
4. Cognitive-strategy Use	.70**	.69**	-.08	—					
5. Self-regulation	.34**	.48**	.33**	.65**	—				
6. Hours on LMS	.02	.10	.04	.09	.01	—			
7. Hours in Flip	.04	.05	-.04	.03	-.11	.59**	—		
8. Final by Average	.22*	.19	-.15	.18	-.09	.19	.36**	—	
9. Final by Grade group	.20	.13	-.16	.19	-.03	.20*	.40**	.87**	—

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

*Correlation is significant at the 0.05 level (2-tailed).

Multiple regression analyses showed that neither the MSLQ's Motivation scale (including Self-Efficacy, Intrinsic Value, and Test Anxiety) nor the MSLQ's Strategy scale (including Cognitive Strategy Use and Self-Regulation) predicted how much learners used the LMS ($p > .05$), how much learners engaged with flipped materials ($p > .05$), or how well learners scored in the flipped class ($p > .05$).

Pearson correlation coefficients, however, did indicate significant correlation when looking at final grades by grade group (A, B, and less than B) instead of final score by average. Significant positive correlation appeared between the number of hours using the LMS and grade groups ($r = .20$, $N = 97$, $p = .048$), indicating that as one variable increased, the other variable also tended to increase. In addition, Pearson correlation coefficients indicated significant correlation between the number of hours learners engaged with flipped classroom materials and final scores separated by letter grade ($r = .40$, $N = 97$, $p < .001$), indicating that as one variable increased, the chance of the grade variable also tended to increase. The effect size here was medium (Cohen, 1988). The appearance of A students, then, correlated with more use of the LMS and more engagement with flipped materials.

In conclusion, a statistically significant relationship appeared between the number of hours learners engaged with flipped classroom materials and learners' final average scores in the class ($r = .36$, $N = 97$, $p < .001$) (see Table 2 above), with a medium effect size (Cohen, 1988). In addition, A grades

correlated significantly with more LMS use and more flipped-material engagement. Overall, the MSLQ did not end up proving any statistically significant prediction between predictor variables of motivation and strategy use and criterion variables operationalized by LMS use, flipped materials engagement, and final scores among Chinese EFL learners in a CBHE context.

4.5 Did the SILL predict engagement and success in a flipped classroom?

Pearson correlation coefficients were used to determine if a statistically significant relation existed between learners' self-reported language-learning strategy use and behavioral and performance outcomes in a flipped EFL classroom (see Table 3 below). Based on the results, no significant correlation appeared between self-reported usages of language-learning strategies and the criterion variable (LMS use, flipped-materials use, final score).

Table 3. Pearson correlation coefficients for SILL and engagement and success in flipped classroom

<i>SILL and Outcomes</i>	1	2	3	4	5	6	7	8	9	10
1. Memory	—									
2. Cognitive	.68**	—								
3. Compensation	.36**	.48**	—							
4. Metacognitive	.55**	.66**	.39**	—						
5. Affective	.58**	.54**	.36**	.59**	—					
6. Social	.49**	.64**	.32**	.78**	.58**	—				
7. Hours on LMS	.020	-.01	-.11	-.002	.04	.07	—			
8. Hours in Flip	-.03	-.05	-.06	-.03	-.03	.04	.59**	—		
9. Final by Average	.17	.17	.13	.14	.13	.19	.19	.36**	—	
10. Final Grade Group	.17	.18	.12	.15	.17	.18	.20*	.40**	.87**	—

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

*Correlation is significant at the 0.05 level (2-tailed).

Multiple regression analyses showed that neither the SILL's Direct Strategy scale (Memory, Cognitive, and Compensation strategies) ($p > .05$) nor the SILL's Indirect Strategy scale (Metacognitive, Affective, and Social strategies) ($p > .05$) significantly correlated with how much learners used the LMS, how much learners engaged with flipped materials, or how well learners scored in the flipped class.

5 Discussion

It was hypothesized that, based on Gardner's (1985, 2001a, 2001b) theory of motivation from a socio-educational viewpoint of SLA, the most motivated learners not only would report high levels of motivation but also would expend the most effort online. Results in this study failed to reject the null hypothesis regarding the first half of the hypothesis. Neither the MSLQ nor the SILL predicted whether learners succeeded in the flipped course. It may be that Chinese EFL learners eschew reporting negative feelings toward the learning situation or the teacher. In some earlier studies, students in China have been shown to seemingly avoid questioning or appearing to challenge teachers or researchers in surveys (Baskir, 2012; Chan, 1999). At any rate, the findings here illustrate why studies on blended learning and flipped classrooms need also to measure how much time learners are logging into and using online materials at home. One-way ANOVA results in this study showed

that expended effort differed significantly among the A, B, and lower-than-B groups. What learners reported, then, differed from actual behavior.

Statistically significant findings did appear, however. Though participants self-identifying as females and males did not exhibit significant difference in (a) MSLQ variables, (b) SILL variables, (c) number of hours using the LMS, or (d) number of hours engaging with flipped materials, female participants achieved significantly higher final scores in the flipped classroom than did males. This result differs from previous findings that female Chinese EFL learners tended to report higher motivation than males (Lamb, 2004; Liu, 2009, 2012; Yang, Liu, & Wu, 2010). In addition, significant differences appeared when analyzing participants by grade levels, with A learners using the LMS and engaging with flipped materials much more than B and less-than-B learners. Finally, a statistically significant correlation appeared between the number of hours learners engaged with weekly flipped materials and final scores in the flipped writing class.

SILL results in this study both matched and contradicted earlier results from Chinese EFL learners. Adapting the SILL for use in a Chinese EFL context, Rao (2005) found learners tended to be highly motivated, to encourage themselves, to rely on teacher authority and direction in studying, and to prefer repeating and reviewing words and concepts over using them. In the present study, learners reported using all the language-learning strategies at a high range level (3.5-5). The findings here showed that although this group preferred metacognitive strategies (4.05), just as Li and Qin (2006) found, the findings here also differ from Li and Qin's (2006) finding that Chinese EFL learners tended to be introverted and to avoid social strategies. In this study, social strategies (4.03) only nominally differed from reported metacognitive strategy use (4.04). In addition, Nisbet, Tindall, and Arroyo (2005) found Chinese EFL learners used metacognitive, cognitive, and social strategies in a high range (3.5-5) and affective, memory, and compensation strategies in the medium range (2.4-3.4), with an overall strategy score of 4.5, which indicated an overall medium-to-high strategy use (Results section, para. 1). The present study, however, showed that learners reported high strategy use in all areas, with a lower strategy mean of 3.89. Nisbet, Tindall, and Arroyo (2005) also found that metacognitive strategy use related significantly with proficiency levels. The data here, however, failed to show significant relationships in this area.

MSLQ results in this study likewise matched and differed from those of earlier studies. First, a statistically highly significant correlation was found between the subscales of cognitive strategies and self-regulation ($r = .65, N = 97, p < .01$), which matches previous findings of the MSLQ use in China (Lee, Zhang, & Yin, 2010; Rao & Sachs, 1999; Sachs, Law, & Chan, 2002). Lee, Zhang, and Yin (2010) predicted that, under current curriculum reform that emphasizes cognitive strategies, Chinese learners would learn to differentiate between the cognitive-strategies subscale and the self-regulation subscale, but results here cannot yet confirm this prediction. Previous research also showed no statistically highly significant relations between test anxiety and (a) self-efficacy, (b) intrinsic value, and (c) cognitive strategies (Lee, Zhang, & Yin, 2010); the findings from this study nearly match these results, except that a significant relation did in fact appear between test anxiety and self-efficacy ($r = -.32, N = 97, p < .01$). The relationship, however, proved only a slight one, of only little value for prediction-design studies (Creswell, 2012).

Other findings relevant to previous research include the lower-than-B group not differing significantly from the A group in terms of reported self-efficacy, even while the B group and the less-than-B group differed significantly. This seems similar to earlier findings that Chinese EFL learners with higher proficiency levels tended to report lower levels of motivation (Zhang & Guo, 2012).

The present study sought to extend literature on flipped EFL classrooms in China (e.g., Doman & Webb, 2017; Webb, Doman, & Pusey, 2014) by exploring time spent engaging with pre-class asynchronous activities in a flipped approach and how, if at all, it correlated with learner variables, such as motivated behavior and learning strategies. Webb, Doman, and Pusey (2014) had reported challenges in motivating students to engage with the pre-class materials. The present study extends this data by suggesting that pre-course-enrollment factors, such as students' strategy use and motivation, may not reliably predict pre-class material engagement. This indicates that other factors outside of language-learning factors may be impacting this key requirement: that students arrive at a flipped classroom prepared. Additionally, this study further supports Doman and Webb's (2017)

conclusion that the flipped model may be becoming increasingly applicable in China as communicative approaches predominate (Doman & Webb, 2017).

6 Limitations and future research

Limitations of the present study existed. Quantitative designs alone cannot fully investigate central phenomena. Future research can avoid this weakness by following up with qualitative data gathering, perhaps to investigate why reported motivation or attitudes might differ from actual usage of flipped materials online. Additional studies need to be conducted based on the results of the present research, paying careful attention to the capacity of an LMS and other modes of online learning to record learners' online behavior. In addition, studies guided by Gardner's theory of motivation (1985, 2001a, 2001b) should pay attention not only to reported attitudes but also to expended effort.

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