

Chinese Undergraduate Students' Language Learning Strategy Use in Flipped English Learning and its Relationships to Gender and Proficiency

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Abstract

The purpose of this study was to examine Chinese undergraduate students' language learning strategy use in flipped English learning and the effect of gender and language proficiency on strategy use. It aimed to enrich the research on language learning strategies as well as the flipped classroom and render implications to EFL instructors on developing students' language learning strategy use in flipped English learning. Research questions in this study revolved around identifying the most and least frequently used language learning strategies in Chinese undergraduate students' flipped English learning, and the influence of gender as well as language proficiency on the frequency of students' strategy use. In this study, the researchers employed random sampling to select 109 students enrolled in the flipped English course for non-English majors at H University in China. Oxford's (1990) Strategies Inventory of Language Learning (SILL) was modified for a flipped classroom context and employed to collect data. T-tests and ANOVAs were used to analyze the data. The results revealed that participants employed language learning strategies with medium frequency in flipped English learning. While they employed social strategies the most frequently, they used metacognitive strategies the least frequently. Furthermore, the male and female participants were not significantly different in their strategy use. However, there was a significant difference in strategy use in relation to English language proficiency in that high proficiency students employed strategies more frequently than low proficiency students. Pedagogical implications are provided.

Keywords: Chinese Undergraduate Students, English language proficiency, flipped classroom, gender, language learning strategy

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Introduction

In the past few decades, the focus of research on the acquisition of English as a Foreign Language (EFL) has shifted from teaching methodology to learners because of the increasingly common recognition that learners are at the center of learning (Noormohamadi, 2009). Accordingly, a growing number of researchers have examined individual factors related to language learning (Challob, 2021; Degani & Goldberg, 2019). Of these factors, Language Learning Strategy (LLS) has been explored widely and found to be critical to language learning success (Bećirović, Brdarević-Čeljo, & Polz, 2021; Oxford, 1990, 2011; Vitta & Woollock, 2019). For years, language learning strategies have aroused the concern of several instructors and researchers. However, most of them have concentrated on language learners' strategy use in traditional classroom settings. A paucity of research has investigated LLSs in flipped classroom settings, especially in China.

In China, EFL is a compulsory subject at all universities. University English teaching in China has traditionally been teacher-centered and lecture-based, which is ineffective in promoting learners' English language learning (Huang, 2022). In response to the problem, the Chinese Ministry of Education asked specialists to design the *Guidelines on University English Teaching*. These guidelines recommend that universities employ the flipped classroom teaching mode in English teaching to create flexible learning environments and student-centered instruction (Wu, 2021). The flipped classroom is the result of fusing technology and education. Researchers found it very effective in developing language learners' academic achievements (Masadeh, 2021; Webb & Doman, 2020). Abeysekera and Dawson (2014) noted that the flipped classroom has acquired worldwide popularity among EFL educators since 2011. However, despite its considerable popularity, very few studies have been conducted (Filiz & Benzet, 2018). Cognitive factors, such as learning strategies in flipped classroom learning, in particular, have rarely been explored.

Accordingly, the present study focused on the use of LLSs among Chinese undergraduate students in their flipped English learning, seeking to identify the most and least frequently used LLSs in students' flipped English learning, and the influence of gender, as well as language proficiency on the frequency of students' LLS use. By fulfilling the above research objectives, this study would enrich the research on LLSs as well as the flipped classroom and render implications to EFL instructors on developing students' LLS use in flipped English learning. The research questions of this study are as follows:

- 1) What are the most and least frequently used LLSs in Chinese undergraduate students' flipped English learning?
- 2) How does gender affect the frequency of LLS use among Chinese undergraduate students in flipped English learning?
- 3) How does English language proficiency affect the frequency of LLS use among Chinese undergraduate students in flipped English learning?

This paper will first review the studies on LLSs and the flipped classroom, which is followed by the introduction of the methodology concerning the participants, instruments, research procedure, and data analysis of this study. Next, later sections on the research results, discussion, conclusion, and implications will be presented.

Literature Review

Language Learning Strategy

Language Learning Strategy (LLS) is an influential factor in foreign language acquisition. As Oxford (2003) stated, LLS is a vital factor that helps figure out how and how well a foreign language is learned. For years, LLSs have been explored by many researchers (Almusharraf & Bailey, 2021; Damanik, 2022; Oxford, 1990, 2003). However, as Jaekel (2020) stated, the concept of LLSs has not been defined uniformly. No consensus has been reached as to whether learning strategies are mental factors related to thoughts or behaviors. Despite the disagreements, researchers have widely agreed that LLSs are employed deliberately to realize learning goals (Almusharraf & Bailey, 2021; Oxford, 2011). The intentionality of LLSs is more evidently reflected in Oxford's (2011) definition, which describes LLSs as language learners' attempts to purposefully and consciously deploy efforts to regulate their language learning. This definition depicts a comprehensive view of the nature of LLSs.

In addition to the definition, Oxford (1990) also worked out the classification of LLSs, categorizing LLSs into two groups, direct and indirect strategies. Direct strategies exert a direct influence on language learning and comprise memory, cognitive, and compensation strategies (Oxford, 1990). Memory strategies are deployed to store new knowledge. Cognitive strategies are employed to help learners comprehend and produce language. Compensation strategies enable learners to overcome limitations in knowledge while using the new language. On the contrary, indirect strategies exert an indirect impact on language learning and consist of metacognitive, affective, and social strategies (Oxford, 1990). Metacognitive strategies are used to self-manage language acquisition. Affective strategies are deployed for controlling learners' emotions as well as attitudes. Social strategies allow learners to learn by interacting with others. By employing the taxonomy of LLSs, Oxford (1990) constructed the Strategy Inventory for Language Learning (SILL), a questionnaire on language learners' LLS use.

Oxford's (1990) classification of LLSs and her SILL are well-recognized and commonly adopted by researchers (Almusharraf & Bailey, 2021; Damanik, 2022; Jaekel, 2020). In China, Oxford's (1990) theory has been widely applied in the study of LLSs use in the conventional EFL learning setting (Jiao & Simon, 2022; Zhen, 2018; Zhou & Intaraprasert, 2015a). Zhen (2018) employed SILL to investigate the LLS use among 105 Chinese college students, finding that they deployed LLSs at a medium level, with compensation strategies used the most frequently, and affective strategies used the least frequently. Jiao and Simon (2022) applied Oxford's theory to examine the LLS use of 269 Chinese EFL learners and achieved similar research findings.

Oxford's (1990) theory has also been used in studies on the correlation between LLS use and certain individual factors, including gender and language proficiency, which have been considered decisive in learners' use of LLS (Bećirović et al., 2021; Montero-SaizAja, 2021). Most research on the influence of gender on LLS use has revealed significant differences in strategy use between female and male language learners (Bećirović et al., 2021; Jiao & Simon, 2022; Zhou & Intaraprasert, 2015a). For example, Xue (2015), in her study on 102 Chinese postgraduate students' LLS use, revealed that female learners exhibited a much more frequent and wider range of strategy use. Jiao and Simon's (2022) study on Chinese EFL learners' LLS use showed a

significant difference in strategy use in relation to gender, with female learners outperforming male learners in the frequency of strategy use.

Furthermore, many studies on the impact of language proficiency on LLSs use reported that LLS use of language learners with different language proficiency levels has varied: more proficient learners are superior to less proficient learners in the frequency and range of strategy use (Alrashidi, 2022; Amjusfa, Yasin, & Muthalib, 2021; Zou & Supinda, 2022;). For example, Zhou and Intaraprasert (2015b) investigated the LLS use of 836 college students from six normal universities in China and found that students with high English proficiency employed the overall LLSs significantly more frequently than their peers with low proficiency. Hou's (2018) study on the role of LLSs in Chinese college students' English language learning also revealed that more proficient English learners employed much more LLSs than less proficient ones.

As noted, being a vital factor determining language learners' success, LLS has been widely studied from different facets, and a considerable number of valuable research findings have been reported. However, while most of these previous studies were carried out in a conventional classroom language learning context, few studies have been conducted in the flipped classroom context. Pawlak and Oxford (2018) pointed out that given the increasingly important role that technology plays in language learning, future studies must explore LLSs in technology-assisted language learning. Accordingly, this study, which examined LLS use among Chinese EFL learners in their flipped English learning, may be regarded as significant.

Flipped Classroom

In the past decade, flipped classroom, the innovative teaching and learning mode has emerged from the combination of technology and education. Concerning the connotation of the flipped classroom, scholars have not come to a consensus and have presented different interpretations. Bergmann and Sams (2012) considered the flipped classroom to be the teaching in which the tasks that are conventionally finished as the assignment out of class are now dealt with in class, and the activities that are conventionally arranged in class are now performed out of class. They further revealed the flipped classroom's inversion nature and demonstrated its superiority over conventional teaching and learning by switching in-class information transmission time with out-of-class practice time (Hwang, Lai, & Wang, 2015). However, Bergmann and Sams' (2012) definition does not specify the relationship between out-of-class learning (or pre-class learning) and in-class learning. As Brame (2013) asserted, the flipped classroom is an ideology that the pre-class learning conducted by exposing learners to teaching content prepares the learners for the in-class active and authentic experiences. Brame's definition reveals that, in a flipped classroom, learners' pre-class content learning is the pre-condition for their in-class experiential learning. This definition does not further present the characteristics of learning activities usually arranged in the pre-class and in-class learning sessions. However, this is made clear by Bishop and Verleger (2013), who stated that the flipped classroom includes two phases, out-of-class self-learning assisted by computer and in-class collaborative learning in groups. In a flipped class, students assume the responsibility of out-of-class learning as independent learners through activities such as watching teaching videos and visiting the course website (Masadeh, 2021). In class, teachers help create an interactive environment in which students work in groups and apply what they have learned before class to complete certain tasks (Turan & Akdag-Cimen, 2020). Although

researchers have not reached an agreement on the definition of the flipped classroom, all the previous interpretations thereof have shed light on its characteristics.

In comparison to conventional classroom instruction, the flipped classroom is characterized first by its emphasis on learners' self-directed learning (Wu & Ma, 2022). Long (2016) pointed out that in self-directed learning, the individual students take the initiative and the responsibility for their own learning. In flipped classrooms, learners are predominantly at the center of learning (Masadeh, 2021). They are expected to self-manage their learning, especially in the pre-class learning phase, by setting learning objectives, devising plans, monitoring their learning process, and reflecting on their learning (Wanner & Palmer, 2015). In addition to self-directed learning, the stress on interactive learning is the second important feature of the flipped classroom (Turan & Akdag-Cimen, 2020). In the in-class learning phase, teachers help create an interactive environment in which students work in groups and conduct learning by collaborating to solve problems and produce outcomes (Wanner & Palmer, 2015). The third characteristic that distinguishes the flipped classroom from conventional learning is the former's adoption of education technology which is a crucial contributory factor to the construction of the pre-class learning environment (Masadeh, 2021). When assisted by education technology, knowledge is absorbed not in a physical classroom but in a virtual learning platform, which "helps to free up class time for more active discussions and tasks" (Webb & Doman, 2020, p. 245).

During the past decade, the flipped classroom has been widely embedded in teaching practice and studied in a variety of disciplines. In the study of foreign language acquisition, as Filiz and Benzet's (2018) summary of related literature shows, the flipped classroom was not given attention until 2014. A majority of studies have since focused on the flipped classroom's effects on learners' academic performance and gains in flipped learning (Masadeh, 2021; Wahib & Tamer, 2021; Webb & Doman, 2020). Only a few studies concentrated on learners' individual characteristics in flipped learning (Abdullah, Hussin, & Ismail, 2020; Ghufroon & Nurdianingsih, 2019). For example, Challob (2021) investigated a group of Iranian college students' motivation in flipped English writing learning. Fard, Shahrokhi and Talebinejad (2021) explored ESP students' attitudes toward flipped English vocabulary learning. Among these previous studies on individual characteristics in flipped language learning, no study focused on LLS, the critical individual factor in language learning. Although massive studies have been conducted in the conventional language learning setting on LLS use and its relationship with individual factors, such as gender and language proficiency, given the significant discrepancy between conventional and flipped learning settings, language learners' LLS use and its relationship with gender as well as proficiency might have distinctive features in flipped language learning. As Pawlak and Oxford (2018) stated, language learners' strategy use pattern in the technology-assisted learning environment might be significantly different from that in the traditional learning environment. Given this, the present study investigated LLS use of a group of flipped EFL learners in a Chinese university to figure out the distinctive features of LLS use and the impact of gender and proficiency in the flipped learning setting.

Methodology

This study aims to investigate Chinese undergraduate students' use of LLSs in their flipped EFL learning and to reveal the influence of gender as well as language proficiency on students'

strategy use frequency in a flipped classroom. To fulfill the objectives, a quantitative questionnaire survey was conducted to collect data. The quantitative research design was widely used in studies on LLS use and its relationship with gender and proficiency (Alrashidi, 2022; Damanik, 2022; Montero-SaizAja, 2021). This design is also suitable to achieve the present study's aim because it enables to explore means of variables and differences between means of different gender or proficiency groups, and thereby helps reveal the frequency of participants' LLS use and the differences of LLS use frequency related to gender as well as proficiency.

Participants

In this study, the participants were a group of freshmen who enrolled in the flipped English course at H University in China. H University is a multi-disciplinary comprehensive university. It set up the program of flipped English teaching in 2014, and it is among the pioneers in flipped English teaching practice at the university level in China. Each year, almost 500 freshmen at HFU enroll in the flipped English course. In this study, 109 freshmen were selected through systematic random sampling as the participants of the questionnaire investigation. According to Yount (2006), the minimum sample size of a small population (101-1000) is 10% of the population. Therefore, the minimum sample size of this study was supposed to be 50. However, to enhance the richness of the data collected, 109 was determined to be the sample size in this study. Among the participants, there were 32 male and 77 female students. The participants' English language proficiency was measured by the scores of their College Entrance English Examination (CEEE), which is the nationwide examination administered by the Chinese Education Ministry to the Chinese students who apply for higher education. Based on the participants' CEEE results, they were classified into three different English language proficiency level groups, namely, a high proficiency group (21 students), an intermediate proficiency group (68 students), and a low proficiency group (20 students).

Research Instrument

The instrument employed to collect data in this study was the Questionnaire of Language Learning Strategy in Flipped Classroom, which was created by adapting Oxford's (1990) SILL (version 7.0). SILL has been widely used for years and is well-recognized as a high-standard instrument to examine foreign/second language learners' LLS use. Its validity and reliability have been endorsed by many studies (Almusharraf & Bailey, 2021; Damanik, 2022). These studies revealed that, when employing Cronbach's alpha, SILL's general reliability is above .9, even when translated into other languages.

SILL includes 50 items that belong to six constructs: Memory Strategies, Cognitive Strategies, Compensation Strategies, Metacognitive Strategies, Affective Strategies, and Social Strategies (Oxford 1990). These six constructs were adopted in the new questionnaire in this study. To make the questionnaire more applicable to the study in a flipped classroom context, some items in SILL which were not in accordance with the characteristics of flipped classroom learning were modified. For instance, the original item six in SILL, "I use flashcards to remember new English words", was replaced by "I use English vocabulary learning APPs to remember new English words" because, in flipped learning, technological English learning tools rather than flashcards are usually used to assist in remembering new words. In this study, all the adaptations of the items were

guided by Oxford's (1990) definition and illustration of the six categories of LLSs, and the literature on flipped language learning.

After the adaptation, a preliminary new questionnaire was produced. It comprises two sections. Section one includes questions on the respondents' personal information. Section two, like SILL, is the six-construct component scale with 50 items, adopting the five-point Likert Scale, with each item scored from 1 to 5. A higher total score indicates more frequent use of LLSs (Oxford, 1990). This study adopted Oxford's (1990) explanation of the score of SILL. A range of average score of 3.5-5 is taken as high frequency of strategy use, 2.5-3.4 medium use, and 1.0-2.4 as low frequency of use. The new questionnaire was translated into Chinese to avoid misunderstanding by the respondents.

After the new questionnaire had been constructed, a pilot study involving 43 participants was carried out. In the pilot study, while answering the new questionnaire, the participants were asked to note down and report any unclear expressions and problematic items in the questionnaire, disagreeable procedures, and unpleasant format or appearance of the questionnaire. Three specialists were also invited to evaluate the questionnaire. Following the participants' and specialists' feedback, the questionnaire was further modified to make it more suitable for collecting the data on the research questions, thereby ensuring the study's validity. SPSS 25 was used to perform Cronbach's alpha coefficient test. The result showed that the Cronbach's alphas for the new questionnaire were 0.92, thus indicating its reliability.

Research Procedure

This study was carried out in a flipped English course in which students conducted their EFL learning in two phases sequentially, the pre-class online learning phase stressing self-directed content learning and the in-class interactive learning phase focusing on productive use of absorbed knowledge in collaborative group work, problem-solving activities, project work and so on. After students had taken a 12-week flipped English course, the participants of this study completed the questionnaire adapted from Oxford' (1990) SILL online with their mobile phones in the researcher's presence in the classroom. Before completing the questionnaire, the participants were given necessary instructions and assured of the confidentiality of their personal information. On average, the respondents took 15 minutes to complete the questionnaire. Once data were collected with the questionnaire, they were processed and analyzed.

Data Analysis

The questionnaire data were processed with SPSS 25. The mean score for each type of LLSs was calculated to measure the frequency of participants using various LLSs. The mean score for all the strategies was also calculated to reveal the overall tendency of using LLS. Subsequently, an independent-samples t-test was conducted to identify whether male and female students in flipped EFL learning were significantly different in using LLS. Finally, a one-way ANOVA was carried out to compare the LLS use of flipped EFL learners in the high, intermediate, and low English language proficiency groups.

Results

Overall Use of Strategies

The participants' overall use of LLSs and their use of the six different categories of LLSs were shown in Table One.

Table 1: *Descriptive statistics on the overall use of LLSs*

Strategies	Minimum	Maximum	Mean	SD
Memory	1.38	4.25	2.99	.57
Cognitive	1.71	4.14	2.90	.45
Compensation	1.86	4.43	3.10	.48
Metacognitive	1.70	4.20	2.76	.47
Affective	1.50	4.67	2.97	.56
Social	1.75	5.00	3.22	.61
Total	2.00	4.08	2.95	.38

Table One indicates that the participants' overall strategy use varied from 2 to 4.08, and the mean score was 2.95, suggesting that participants used LLSs at a medium level in their flipped EFL learning. Of the six categories of LLSs, the mean score of social strategies ($M = 3.22$) ranked the highest. It was followed by compensation Strategies ($M = 3.10$), memory strategies ($M = 2.99$), affective Strategies ($M = 2.97$), and cognitive Strategies ($M = 2.90$). Metacognitive strategies had the lowest mean score ($M = 2.76$). The finding suggested that among the six categories of LLSs, social strategies were the most frequently employed and metacognitive strategies were the least frequently employed.

In addition to participants' overall use of LLSs, the influence of gender on the frequency of participants' LLS use was explored below.

Use of Strategies by Gender

To examine the influence of gender on participants' LLS use frequency, an independent t-test was applied to figure out whether there existed any differences between male and female participants' LLS use frequency. The result of the independent t-test was summarized in Table Two.

Table 2: *Summary of statistics of LLS use in terms of gender*

Strategies	Male Group		Female Group		T	Sig. (2-tailed)
	Mean	SD	Mean	SD		
Memory	2.98	.59	2.99	.56	-.07	.95
Cognitive	2.84	.50	2.92	.43	-.85	.40
Compensation	3.07	.53	3.12	.46	-.45	.65
Metacognitive	2.74	.56	2.77	.43	-.34	.73
Affective	2.93	.50	2.99	.59	-.50	.62
Social	3.22	.63	3.21	.61	-.03	.97
Total	2.91	.44	2.96	.36	-.59	.56

Table Two shows that female and male participants' overall strategy use did not vary significantly ($p > 0.05$), and the mean score of females (Mean = 2.96) participants' overall use of strategies was just slightly higher than that of the male participants (Mean = 2.91). Concerning the use of each

category of LLSs, similarly, no significant gender difference was identified ($p > 0.05$). The mean scores of female and male participants' uses of each category of LLSs were close to each other. The results indicated that there was no significant difference in LLS use in relation to gender.

After the analysis of the role played by gender in participants' LLS use, the impact of English language proficiency was analyzed in the next section.

Use of Strategies by English Language Proficiency

To figure out the influence of English language proficiency on participants' LLSs use frequency, a one-way ANOVA was performed to examine if participants from different proficiency groups varied considerably in their LLS use. The employment of the LLS among participants in the three English proficiency level groups was displayed in Table Three.

Table 3: Summary of statistics of LLS use in terms of English language proficiency

Strategies	High (N=21)		Intermediate (N=68)		Low (N=20)		F	Sig.
	Mean	SD	Mean	SD	Mean	SD		
Memory	3.33	.47	2.97	.57	2.68	.45	7.907	.001
Cognitive	3.23	.39	2.89	.44	2.55	.29	14.574	.000
Compensation	3.35	.49	3.13	.47	2.78	.31	8.693	.000
Metacognitive	3.07	.45	2.77	.45	2.41	.27	12.295	.000
Affective	3.15	.49	3.00	.59	2.7	.46	3.660	.029
Social	3.18	.58	3.30	.59	2.95	.68	2.718	.071
Total	3.21	.35	2.96	.36	2.62	.25	15.923	.000

As presented in Table Three, the one-way ANOVA results revealed significant differences in the employment of LLS among participants in high, intermediate, and low proficiency level groups ($p < 0.05$). With regards to the six different categories of LLSs, while the use of memory strategies ($p < 0.05$), cognitive strategies ($p < 0.05$), compensation strategies ($p < 0.05$) and metacognitive strategies ($p < 0.05$) differed significantly among the participants from different proficiency groups, the use of affective strategies ($p > 0.05$) and social strategies ($p > 0.05$) were not significantly different. The mean scores of the overall strategy use of those in high ($M = 3.21$), intermediate ($M = 2.96$), and low ($M = 2.62$) proficiency groups decreased gradually. The participants in the high proficiency group ($M = 3.33$, $M = 3.23$, $M = 3.35$, $M = 3.07$, $M = 3.15$, $M = 3.18$) demonstrated a higher frequency in using all the different categories of LLSs, compared with the participants in the low proficiency group ($M = 2.68$, $M = 2.55$, $M = 2.78$, $M = 2.41$, $M = 2.7$, $M = 2.95$). The findings indicated that there existed significant differences in LLS use in relation to English language proficiency with more proficient students employing LLSs more frequently.

Discussion

The statistic analysis in the previous section reveals a series of findings related to the three research questions in this study.

RQ One: What are the most and least frequently used LLSs in Chinese undergraduate students flipped English learning?

In this study, social strategies were employed more frequently than other categories of LLSs and thus were the most preferred strategies. This is inconsistent with the results of those studies on Chinese undergraduate students' strategy use in a traditional learning setting, which presented that compensation strategies were deployed more frequently (Jiao & Simon, 2022; Zhen, 2018). The high use of social strategies in this study may result from the frequent interaction in flipped learning. In the flipped classroom, based on pre-class content learning, most in-class time is spent on various interactive and collaborative activities (Turan & Akdag-Cimen, 2020), which considerably increases the chances for communication, thus promoting students' use of social strategies.

This study showed that the participants employed metacognitive strategies the least frequently. This is incompatible with those studies on Chinese undergraduate students' strategy use in a traditional learning setting, which reported that affective strategies were deployed the least (Jiao & Simon, 2022, Zhen, 2018). The participants' inadequate use of metacognitive strategies in this study may be related to Chinese undergraduate students' lower competency in self-managing their EFL learning and flipped learning's strong demands for learners' self-management. In China, students have typically learned English for ten years in teacher-centered and lecture-based learning contexts before they attend university. Influenced by ten years of passive knowledge-receiving learning experiences, first-year students at university are not accustomed to the highly self-managed learning in the flipped classroom, which leads to the low use of metacognitive strategies concerning arranging, planning, and evaluating one's own language learning as independent learners.

RQ Two: How does gender affect the frequency of LLS use among Chinese undergraduate students in flipped English learning?

The study showed no significant divergences in Chinese undergraduate students' LLS use in relation to gender in their flipped EFL learning. The LLS use frequencies of female and male participants were close to each other, which indicated that the influence of gender was relatively small. This result does not concur with the majority of studies on LLSs in a traditional learning context in China, which reported that female and male language learners varied considerably in strategy use, with the former exhibiting a more frequent and wider range of strategy use (Jiao & Simon, 2022; Xue, 2015). The similarity of male and female learners' strategy use in this study may be related to the fact that although female learners are reported to be more talented in employing strategies to learn a new language (Oxford & Ehrman, 1993), male learners also have their own advantages in flipped language learning. Research has shown that male learners are more interested in and better at learning that is more creative and exciting (Prokop, 1989). In the flipped classroom, the pre-class self-directed learning, the in-class interactive learning, and the application of technology make the learning mode completely different from that in the conventional learning environment, which results in a more refreshing, exciting, and creative learning experience for learners. Therefore, male learners might be more active in flipped learning and better at using strategies in the flipped classroom, which helps counteract female learners' innate advantage in language learning and strategy use.

RQ Three: How does English language proficiency affect the frequency of LLS use among Chinese undergraduate students in flipped English learning?

This study showed significant differences in Chinese undergraduate students' LLS use regarding their English proficiency level in flipped EFL learning. Students with high language proficiency had much more frequent employment of LLS than students with low proficiency. These findings indicated that language proficiency exerted an intense influence on students' LLS use frequency. This coincides with the studies on LLS use in a traditional learning setting in China, which reported that language proficiency has a significant effect on learners' strategy use, with the more proficient students outperforming the less proficient ones in the frequency and range of strategy use (Hou, 2018; Zhou & Intaraprasert, 2015b).

Conclusion

This study aimed to investigate the LLS use and its relationship with gender as well as English language proficiency in Chinese undergraduate students' EFL flipped learning. The findings indicated that in flipped EFL learning, Chinese undergraduate students are medium strategy users and use different categories of LLSs with varying frequencies. While social strategies were used the most frequently, metacognitive strategies were employed the least, despite their importance to students' self-directed learning in flipped context. The current study also revealed that English proficiency plays a significant role in Chinese undergraduate students' LLS use in their EFL flipped learning, with more proficient EFL learners using LLSs much more frequently than less proficient learners. However, the influence of gender is insignificant.

Implications

This study provides certain implications for the EFL pedagogy in the flipped classroom. Firstly, to assist Chinese undergraduates in becoming more competent strategy users in flipped EFL learning, it is of significance to integrate LLS instruction and training into a regular EFL flipped class. The flipped classroom emphasizes self-directed, interactive, and technology-assisted learning, making it significantly different from the traditional learning mode. To help students adapt to and successfully conduct flipped EFL learning, teachers can embed LLS instruction and training in self-directed, interactive, technology-assisted learning activities in the flipped class, leading students to learn and practice the skills of appropriately selecting and employing LLSs in these typical flipped EFL learning activities, and thereby develop students' ability to use strategies effectively. In this process, particular attention should be paid to the instruction and training of metacognitive strategies because Chinese undergraduate students tend to be less competent in deploying this category of strategies in their flipped EFL learning. Secondly, EFL teachers should attach importance to the impact of individual factors on students' strategy use and take into account the individual differences when they design the LLS instruction and training. In particular, it is recommended that teachers vary the strategy training design in accordance with students' English proficiency levels. As revealed in this study, high and low proficiency students differed in their LLS use. Accordingly, students with different proficiency levels may have different needs in relation to strategy instruction and training. Therefore, it is of paramount importance that teachers customize the strategy instruction and training objectives, methods, and evaluating systems to meet the particular needs of students with varying proficiency levels.

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