

## Flipping the classroom in teaching Chinese as a foreign language

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### Abstract

*Through an in-depth analysis of quantitative and qualitative data, this article offers a case study of the advantages and challenges in the application of the flipped learning approach in the instruction of Chinese as a foreign language at the beginning level. Data were collected from two first-year Chinese classes (one in traditional and the other in flipped format) to investigate whether there were statistically significant differences in learning outcomes and students' levels of satisfaction between the two classes. Final exam and oral test scores showed that students in the flipped class performed better in speaking, since more time was devoted to meaningful interactions in class. As indicated in the results of the end-of-the-semester questionnaire, these students also gave higher average ratings on three aspects of their learning experience: level of required self-directedness, amount of practice in class, and stimulation of interest in the subject.*

**Keywords:** *Blended Learning and Teaching, Instructional Design, Less Commonly Taught Languages*

**Language(s) Learned in this Study:** *Chinese*

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### Introduction

Flipped learning is defined as follows:

a pedagogical approach in which direct instruction moves from the group learning space to the individual learning space, and the resulting group space is transformed into a dynamic, interactive learning environment where the educator guides students as they apply concepts and engage creatively in the subject matter.” (Flipped Learning Network, 2014, p. 1).

The repurposing of class time enables students to “inquire about lecture content, test their skills in applying knowledge, and interact with one another in hands-on activities” (EDUCAUSE, 2012, p. 1).

With promising potentials, flipped learning has gained rapid momentum in higher education in recent years. A large portion of research that uses surveys with Likert scale and free text responses has shown increased student satisfaction with the flipped learning approach (e.g., Butts, 2014; Critz & Wright, 2013; Davies, Dean, & Ball, 2013; Mason, Schuman, & Cook, 2013; Prober & Khan, 2013; Yeung & O'Malley, 2014). The flipped approach has also brought about an increase of academic performances as indicated by improved examination results, overall improved post-test scores, or higher course grades compared to classes in previous semesters (Ferreri & O'Connor, 2013; Mason et al., 2013; Missildine et al., 2013; Pierce & Fox, 2012). An increase of class attendance was observed in previous research (McLaughlin et al., 2013) as well. McLaughlin et al. (2013) also reported that preference for the flipped classroom format increased from 41 students (27.3%) to 126 students (84.6%) after the students had engaged in the flipped approach for one semester. Feedback from student course evaluations identified opportunities for

developing communicative skills, preferences for teamwork, and an increase in active learning in the flipped approach (Ferreri & O'Connor, 2013; Strayer, 2012). However, the same studies also found that students have some negative views on the flipped learning approach, despite their improved grades. For example, Ferreri & O'Connor (2013) found that course evaluations of the flipped approach included more negative comments related to the grading of assessments and the amount of pre-reading assignments. Strayer (2012) found that students experienced a higher level of unpredictability and unsettled feelings when adjusting themselves to the learning tasks in the flipped approach and had difficulties making in-class connections with the online learning component. Furthermore, in a survey investigating college students' readiness of flipped learning approach, only 39% of the 84 participants agreed that the flipped learning approach met their learning needs (Hao, 2016). Thus far, research on students' satisfaction with the flipped learning approach has been inconclusive.

Research has begun to emerge on the application of flipped learning in the field of foreign language instruction. A report on such application for English as a foreign language students' learning of English idioms indicated that it enhanced students' motivation and ability to use English idioms more actively (Chen-Hsieh, Wu, & Marek, 2016). An investigation (Hung, 2015) of the possible impacts of flipped learning on English language learners' academic achievements, attitudes toward the learning experiences, and efforts devoted to the course indicated that the flipped approach enabled students to (a) achieve better learning outcomes as measured by three end-of-lesson assessments, (b) develop better attitudes toward learning based on the results of a learning experience questionnaire, and (c) engage themselves more in the learning as measured by the lesson study logs that tracked students out-of-class study time and effort. However, this study only reported that students from the flipped class received higher overall grades in the lesson assessments than the students from the non-flipped class did, without further discussion of which specific language skills (e.g., listening, speaking, reading, and writing) could be better developed through the use of the flipped approach.

Research on flipped learning has not been limited to L2 English courses. Watanabe (2014) examined 163 university students' experiences of viewing pre-learning video clips online in an intermediate-level Japanese language course in Australia. Records of students' video access were analyzed to gauge their engagement with the video clips. Each pre-learning video clip was created with Microsoft PowerPoint with a voice-over in Japanese to explain the key grammar structures. Online quizzes accompanied each video clip, though students were not required to finish them. Watanabe reported that only 10% of the subjects regularly viewed the video before the class, and only those who found the contents of the video clips useful became dedicated viewers who watched the entire video clip. He then suggested that classroom activities should effectively integrate with the content presented in the video clips to encourage previewing.

So far, few formal data have emerged to show the effect of flipped learning on certain student populations, such as beginning learners of a foreign language other than English. In light of students' mixed perceptions of flipped learning, there is a need for stronger evidence in evaluating the effects of flipped learning on the improvement of each of the four language skill areas (speaking, listening, reading, and writing). Efforts should also be made to explore the effective methods for evaluating flipped learning and ways to increase students' engagement with the video clips outside of class (Haladyna, Downing, & Rodriguez, 2002; Watanabe, 2014). Through a case study with in-depth analysis of quantitative and qualitative data, this article aims to explore the advantages and challenges of applying the principles of flipped learning in the instruction of Chinese as a foreign language at the college level. The case that serves as the object of our study is the flipped first-year Chinese class at a Midwest university in the United States, first taught in the 2015–2016 academic year.

## **Course Design and Implementation**

Our design philosophy had two theoretical foundations: Bloom's revised taxonomy of cognitive process (Krathwohl, 2002) and Vygotsky's (1978/2005) socio-cultural theory. The former is a framework created

by Bloom, Englehart, Furst, Hill, and Krathwohl (1956) for classifying statements of what students are expected to learn after receiving the instruction and has been often used for designing educational training and learning processes. A revised taxonomy is proposed by Anderson and Krathwohl (2001) to reflect a more active form of thinking. It suggests that any learning objectives of a unit or course can be analyzed in two dimensions: knowledge and cognitive process. The knowledge dimension includes four types of knowledge that learners may be expected to acquire or develop: (a) factual knowledge, such as knowledge of specific elements and details or knowledge of terminology; (b) conceptual knowledge, such as knowledge of principles and generalization, classifications and categories, theories, models, and structures; (c) procedural knowledge, for example, knowledge of subject-specific skills and criteria for determining when and how to use appropriate procedures; and (d) metacognitive knowledge, such as knowledge of strategies. The cognitive process dimension reflects thinking skills with different levels of cognitive complexity, such as remembering, understanding, applying, analyzing, evaluating, and creating.

As pointed by Vygotsky's (1978/2005) socio-cultural theory, learning is just as much a social process as a cognitive process. A social environment for learning provides the expert access and cultural tools needed to help students arrive at the highest level of proficiency at the right time. Therefore, social learning activities are more effective in instructing higher-level cognitive processes, such as analyzing, creating, and evaluating, while lower-level cognitive processes can be taught through self-paced learning. Previous empirical studies showed that some types of knowledge, such as the knowledge of basic facts and foundational information, can be learned best through exposure and repetition (Geary, 2007, 2008). Accordingly, most factual knowledge and conceptual knowledge can be learned via self-paced e-learning, which provides the opportunities of multi-mode exposure and self-paced repetition.

Our conceptual framework for analyzing the learning content is indicated in Table 1. The shaded area was delivered via self-paced e-learning, while the transparent area was mainly instructed through social learning activities in a face-to-face classroom. Specifically, online learning sessions were designed for students to understand and remember new vocabulary and grammar items. Online quizzes were used to test if students were able to apply and analyze the factual and conceptual knowledge of the new grammar items and vocabulary. Class time was mainly devoted to higher-level cognitive processes, such as analysis, application, evaluation, and creation.

Table 1. *The Analysis of the Learning Content*

Knowledge Dimension	Cognitive Process Dimension					
	Remember	Understand	Apply	Analyze	Evaluate	Create
Factual Knowledge	List	Summarize	Respond	Select	Check	Generate
Conceptual Knowledge	Recognize	Classify	Provide	Differentiate	Determine	Assemble
Procedural Knowledge	Recall	Clarify	Carry Out	Integrate	Judge	Design
Metacognitive Knowledge	Identify	Predict	Use	Deconstruct	Reflect	Create

*Note.* This table is adapted from Anderson and Krathwohl (2001, pp. 67–68).

Our regular first-year Chinese class employed the lecture–drill format, with students attending larger lecture based grammar sessions on Tuesdays and Thursdays, and smaller drill sessions on Mondays, Wednesdays, and Fridays. All class sessions used the face-to-face format. In the flipped first-year Chinese class, students met four times per week (Monday through Thursday). Grammar lectures were replaced by online self-learning sessions (an equivalent of one credit). Both regular and flipped class were intensive 5-credit beginning level classes taught by the same instructors over the course of a year. One of the

instructors was also one of the researchers of the article. Both classes used the identical teaching materials, except that in the lecture-based grammar sessions of the regular classes, the instructors improvised some examples based on the interactions with the students in class. Students enrolled in either class voluntarily according to their schedules.

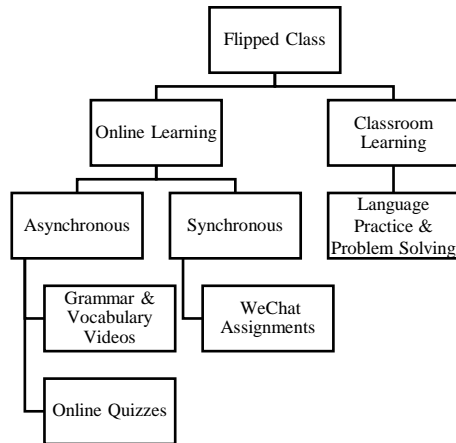


Figure 1. The main tasks and activities of the flipped class.

The main tasks and activities of the flipped class are summarized in Figure 1. Before each class, students were required to watch an online video clip created via Camtasia. Each video clip introduced students to the new vocabulary and grammar items of that class and was no longer than 10 minutes. The decision on the length of the video was made in light of research that has shown that “the novelty of any stimulus tends to wear off after about 10 minutes, and as a result, learners tend to check out after 10 minutes of exposure to new content” (Goodwin & Miller, 2013, p. 79). Videos for each lesson provided clear pronunciation of vocabulary and lucid explanation of grammar. Students posted their questions on an online discussion board and were encouraged to reply to each other’s questions. When there was no response, the instructor stepped in to make sure that each question was well addressed. This time-saving practice eliminated the need for the instructor to email each individual student to answer his or her questions. It also increased the interaction between students and fostered social learning among them.

Please complete the following sentences, using the English sentences as clues. **(Tone marks are not necessary.)**

1. Míngtiān wǒmen yào xué \_\_\_\_ yìkè . (We will study Lesson One tomorrow.)

Answer:  [Submit Answer](#)

2. Tā xiězì xiě \_\_\_\_ hěnhǎo. (He writes characters well.)

Answer:  [Submit Answer](#)

3. Zhè gè diànyǐng tài yǒuyìsī \_\_\_\_ ! (This movie is really interesting!)

Answer:  [Submit Answer](#)

4. Wǒ jiāo nǐ \_\_\_\_ tiàowǔ . (I will teach you how to dance.)

Answer:  [Submit Answer](#)

5. Wǒ xiǎowǔ wúdiǎn \_\_\_\_ chí wǎnfàn le. (I had dinner as early as 5:00 p.m.)

Answer:  [Submit Answer](#)

6. Wǒ jīntiān \_\_\_\_ máng. (I am a little bit busy today.)

Answer:  [Submit Answer](#)

*Figure 2.* An online quiz to test students' understanding of the new grammar items.

After watching each of the video clips, students were required to complete an online quiz (see [Figure 2](#)) to test their understanding of the content of the video clip. The quizzes were delivered through the course management system, Sakai; the scores counted as 5% of the final grade. Students were notified of their grades right after submitting their answers. WeChat, a mobile messaging app, was employed to foster the after-class learning. At least once a week, students chatted with the instructor via WeChat's audio messaging feature at a designated time slot outside of class. Students engaged in a dialog with the instructor based on a given scenario or topic related to the course content. Instant feedback was provided by the instructor via audio messaging in each chatting session, lasting 5–10 minutes.

## Data Collection

To examine the effects of the flipped approach on students' learning of Chinese as a foreign language, we collected data from students in both traditional and flipped classes with regard to the following: (a) final exams and oral tests, (b) students' perceptions of the flipped learning experience, and (c) in-class observations by the instructors. The data were used in researching whether there were any statistical differences in learning outcomes and student satisfaction between the flipped class and the traditional class. There were a total of 17 students involved in the fall semester of 2015, with eight in the flipped class and nine in the traditional class. Right before the semester started, all students took a Chinese placement test with both written and oral exams, as well as the Oxford Language Aptitude Test. The written exam of the placement test consists of three parts: grammar, reading, and composition. The oral exam required students to answer a number of questions initiated by the instructor to assess their oral language ability. The Oxford Language Aptitude Test was used to assess students' ability to analyze how languages work, as the outcome of this test is not affected by students' prior knowledge of any particular language (Langslow, 1996). A two-tailed independent *t*-test was conducted to determine whether there were differences between students from the two classes in their scores of each section of the placement test (grammar, reading, composition, and oral exam) and the Oxford Language Aptitude Test. The mean scores of placement test and the Oxford Language Aptitude test from the two classes are shown in [Table 2](#). There were no significant differences between the two groups of students in their scores of grammar ( $t = -1.81, p = .09$ ), reading ( $t = -0.93, p = .37$ ), composition ( $t = -0.52, p = .61$ ) and oral exam ( $t = -0.62, p = .54$ ). The results of the Oxford Language Aptitude Test also did not show significant differences ( $t = -0.29, p = .78$ ) in students' language learning aptitude.

*Table 2.* Mean Scores for the Placement Test and the Oxford Aptitude Test

	Placement Test				The Oxford Aptitude Test
	Grammar	Reading	Composition	Oral Exam	
Traditional	19.22	15.33	15.00	16.67	25.89
Flipped	24.38	18.50	15.75	17.25	27.13

Students also completed a background questionnaire. The background questionnaire gathered information on students' demographics such as their age, major, native language, and exposure to other languages, as well as information concerning their previous e-learning experience and computer use (especially with regard to the ratio of their work and recreational time on the computer). The backgrounds of students in the two classes turned out to be quite similar. All the participants were native English speakers. Eight out of the nine in the traditional class were freshmen; one was a sophomore. Seven out of the eight in the flipped class were freshman; one was a sophomore. The students were similar in terms of experience and comfort with technology and access to computers. The average amount of time students spent on computer per day was also similar: 4.6 hours for those in the flipped class and 4.3 hours in the traditional

class. Those in the traditional class used about 63% of their computer time for school work and job-related activities while those in the flipped class spent around 68% of their computer time for the same purpose. None of the students had experience with flipped learning before.

At the end of the first semester, students in both classes took identical written final exams and oral tests. The final exam included listening, reading, and writing sections to measure their learning in the target language. The listening section was composed of 10 multiple-choice questions based on one passage and one dialogue. The reading section contained two passages, and each passage had 5 multiple-choice questions. The writing section required students to write a paragraph using given grammar structures with at least 70 Chinese characters. In the oral test, students answered the questions initiated by the instructor to test their uses of the instructed grammar items.

All tests were re-graded for the purposes of this study so that the same criteria were used for all scorings. Two Chinese instructors who had more than 5 years of teaching experiences and who did not know about the purpose of the study graded the writings produced by the students following a rubric measuring content, organization, use of transitions, syntactic complexity and variety, grammatical accuracy, and character errors. The inter-rater reliability of their grading was .98. The two instructors also graded the recorded oral tests based a rubric measuring comprehensibility, fluency, vocabulary usage, syntax and grammar, and pronunciation, and reached an inter-rater reliability of .99. Scores of both the final exam and the oral test were used to compare the learning outcomes of students in the two classes. A questionnaire was distributed at the end of the semester to solicit information from students about their perceptions of the learning experience. Results of the questionnaire and instructors' class observations were mainly used to gauge student satisfaction levels.

## Results

### Students' Test Results

We compared students' mean test scores for each of the four skills: listening, speaking, writing, and reading. We also compared the breakdowns of the writing scores and the speaking scores according to their respective grading rubrics. The statistical descriptions of the test scores for the four skills are summarized in Table 3. Students in the flipped class received higher mean scores in speaking, writing, and reading than their counterparts in the traditional class did. Due to the small sample size and non-normal distribution of most of the data from the two classes, Mann-Whitney  $U$  tests (a non-parametric method) were adopted to make further comparisons. The test results showed a significant difference ( $U = 18.50, p = .048$ ) between the speaking test scores of the two groups, while no significant differences were found in the reading and writing test scores of the two groups.

**Table 3.** *Statistical Description of the Test Scores for Listing, Speaking, Writing, and Reading*

<b>Variable</b>	<b>Group</b>	<b><i>N</i></b>	<b><i>M</i></b>	<b><i>SD</i></b>	<b><i>SEM</i></b>
Listening	Traditional	9	23.66	2.18	0.73
	Flipped	8	23.50	2.51	0.89
Speaking	Traditional	9	46.18	3.05	1.02
	Flipped	8	48.54	0.86	0.30
Writing	Traditional	9	25.15	2.24	0.75
	Flipped	8	26.64	0.95	0.34
Reading	Traditional	9	19.78	0.67	0.22
	Flipped	8	20.00	0.00	0.00

Mann-Whitney  $U$  tests were also conducted to further analyze whether the students in the two classes performed differently in terms of the six rubric categories for speaking (see Table 4). A significant difference was found in the scores of speech comprehensibility between the two classes ( $U = 16.00$ ,  $p = .02$ ). The flipped class ( $Mdn = 10.00$ , mean rank = 11.50) performed better in speech comprehensibility than the traditional class ( $Mdn = 8.95$ , mean rank = 6.78). The overall results suggest that students in the flipped class outperformed those in the traditional class in speech comprehensibility, though there were no significant differences in the scores of other five speaking rubric categories.

**Table 4.** Statistical Description of the Test Scores for Each of the Speaking Rubric Categories

Variable	Group	$N$	$M$	$SD$	$SEM$
Comprehensibility	Traditional	9	8.91	0.79	0.26
	Flipped	8	9.69	0.62	0.22
Fluency	Traditional	9	9.38	0.56	0.19
	Flipped	8	9.83	0.14	0.05
Vocabulary	Traditional	9	9.63	0.58	0.19
	Flipped	8	9.94	0.16	0.06
Syntax	Traditional	9	9.22	0.86	0.29
	Flipped	8	9.69	0.29	0.10
Pronunciation	Traditional	9	9.03	0.55	0.18
	Flipped	8	9.39	0.31	0.11

Similarly, Mann-Whitney  $U$  tests were carried out to further test whether participants in the two classes performed differently in terms of the six writing rubric categories (see Table 5). The results showed that there was a significant difference ( $U = 16.00$ ,  $p = .02$ ) between the two groups in the scores of syntactic complexity and variety. The flipped class ( $Mdn = 4.45$ ; mean rank = 11.50) scored higher on syntactic complexity and variety than the traditional class ( $Mdn = 4.00$ ; mean rank = 6.78). This suggests that flipped class students performed significantly better than the students in the traditional class in generating complex and various sentences. However, no significant differences were found between the two groups in the scores of other five writing rubric categories.

**Table 5.** Statistical Description of the Test Scores for Each of the Writing Rubric Categories

Variable	Group	$N$	$M$	$SD$	$SEM$
Content	Traditional	9	4.57	0.30	0.01
	Flipped	8	4.53	0.37	0.13
Organization	Traditional	9	4.24	0.41	0.14
	Flipped	8	4.59	0.14	0.05
Transition	Traditional	9	4.03	0.39	0.13
	Flipped	8	4.24	0.28	0.10
Syntactic Complexity and Variety	Traditional	9	4.15	0.30	0.10
	Flipped	8	4.48	0.12	0.04
Accuracy	Traditional	9	4.02	0.77	0.26
	Flipped	8	4.49	0.41	0.15
Characters	Traditional	9	4.14	0.68	0.23

Flipped	8	4.33	0.93	0.33
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### Students' Satisfaction with the Course

Students' satisfaction with the course was measured at the end of the semester with a questionnaire that contained twelve items: course clarity, meeting of expectations, course organization, out-of-class working time, amount of practice in class, interactions in class, students' self-directedness, feedback received, effectiveness of the instruction, stimulation of students' interests, creation of a supporting learning environment, and willingness to recommend the course to other students. The questionnaire used a 5-point Likert scale, ranging from 1 (Strongly Disagree) to 5 (Strongly Agree). As shown in Figure 3, on average, the flipped class students rated three items relatively higher than the traditional class students: the amount of practice in class, the level of the self-directedness, and their stimulation of interest in the subject. They also had slightly higher mean ratings on the items of course clarity, feedback, and willingness to recommend the course. To determine if there were statistical differences between the two classes' satisfactions, Mann-Whitney *U* tests were conducted, again due to the small sample size and the non-normal distribution of the data. No significant differences were found between the two groups in terms of their ratings on any of the twelve items in the questionnaire.

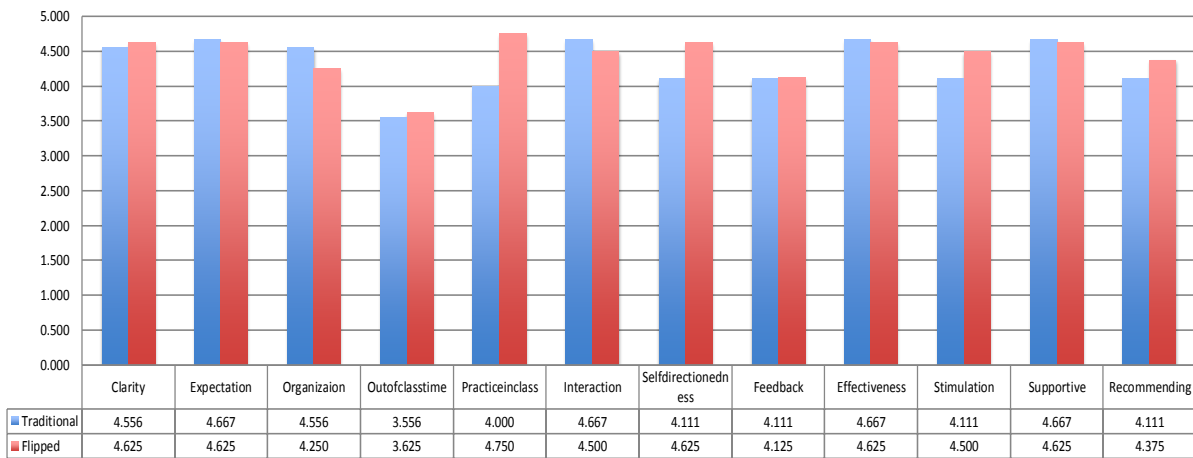


Figure 3. The average ratings on the items of the course satisfaction questionnaire.

### Discussion

The flipped learning approach is predicated on the premise that active learning in the classroom can be enhanced by shifting lower-level cognitive processes (e.g., understanding and remembering) to self-paced online learning, while class time can be devoted to higher-level cognitive process, such as application, analysis, evaluation, and creation. The validity of this premise is confirmed by our study: students in the flipped class outperformed those in the traditional class students in speaking, since more time was devoted to meaningful interactions in class.

Classroom observations and the end-of-the-semester questionnaire results also indicate that the flipped learning approach increased students' engagement. On the questionnaire, they gave higher average ratings than those in the traditional class on three aspects of their learning experience: level of required self-directedness, the amount of practice in class, and the stimulation of interests in the subject. Instructors of the two classes also reported that students in the flipped class were better prepared for classroom practice. Students' comments from the flipped class in the course evaluation further confirmed their sense of ownership of the learning process and their appreciation of the flexible and individually-paced learning:

*I can review or preview lessons as often as I want. The videos are always posted so I can use them to*



*refer back to.*

*I enjoy not having class 5 days a week and the flexibility of this class.*

*It is nice to be able to watch a video and then prove you understand concepts. The concepts are presented very well. I understand material very well after watching the videos usually.*

In implementing the flipped learning approach, we also faced a set of distinct challenges and learned valuable lessons. First, the flipped language class may not be a good fit for all, as different students have different learning styles. Expectations regarding the amount of time needed for out-of-class activities need to be conveyed to and understood clearly by students. A screening process is desirable, so as to admit students who are self-motivated and who are good at time management and self-regulated learning. To help cultivate the sense of responsibility on the part of the students outside of the face-to-face contact time, training sessions on good study habits may be necessary at the beginning of the course.

Second, in designing the course, one should have a general sense of the kind of problems students might encounter when engaging with online learning content, though some problems are hard to predict at the design phase. Additional time and technological support might be required for instructors to solve all kinds of unexpected problems during teaching.

Third, with valuable classroom hours freed up from the explanations of grammar, instructors faced the challenge of restructuring their teaching plans so as to use the classroom time most effectively and productively. There was a need to rework existing resources to integrate seamlessly the online learning content with the classroom instruction.

Lastly, mechanisms should be set up to monitor students' learning outside of class. The flipped learning approach is most effective when all students complete the online study session before class. A single unprepared student could significantly slow down the class pace. Although the length of time students stayed at the designated website and the frequency of their visits could be tracked, we could not know for sure that they were always doing what they are supposed to do during those times. Our online quizzes were designed to ensure that students completed the online learning session beforehand. Those quizzes functioned as a low-stake, formative assessment to help students determine if they had understood the concepts introduced in the online video and to facilitate the delivery of feedback on their understanding. However, those quizzes tended to be rigid in that there could be only one answer to a given question, though in real life, the same meaning or message could have been conveyed in different ways. Therefore, convergent questions worked better than divergent questions for those quizzes.

## Conclusion

Our study, though rather limited in scope, is meant to stimulate discussion of flipped learning in foreign languages generally and in Chinese particularly. In the future, data from a wider range of courses at different levels will provide fruitful ground to explore a variety of issues, such as the seamless integration of classroom activities with online learning sessions and ways to foster individual students' self-learning ability for better adaptation to the flipped learning approach. Research on these issues will help us continue to adjust to various challenges of using the flipped approach in the field of foreign language instruction.

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