

A pilot evaluation of the Chinese learning system to support a flipped classroom

Yi-Hsuan Wang

Department of educational technology,
Tamkang University, Taipei, Taiwan
annywang12345@hotmail.com

Abstract—The study is a multi-phase study. The researcher aims to conduct a series of study through several research stages to investigate how the use of learning technology could foster classical Chinese flipped learning. In this study, the researcher had developed the Chinese learning system based on the previous research results from the first stage research and conducted the experiment to evaluate whether the developed Chinese learning system could facilitate classical Chinese learning. The findings revealed that the students who learned with and without the developed system together with the flipped classroom learning all improved their Chinese performance. However, it was noticeable that the learners who used the developed system showed better motivation in terms of self-directed preview learning. The use of the developed has the potential to support the flipped classroom strategy for classical Chinese learning. Suggestions and future work are also discussed in the end of the paper.

Keywords- *Flipped classroom; Classical Chinese learning; Educational Evaluation*

I. INTRODUCTION

Chinese learning is an import learning subject of several Asian countries. Chinese teaching includes modern Chinese and classical Chinese learning. Classical Chinese is the language that was used by the ancients for the purposes of domination and communication [1], and the wording and sentence construction of classical Chinese are much more complicated than in modern Chinese. Classical Chinese learning is the core curriculum for teenagers in senior high school Chinese course. However, research had found that students feel bored when learning classical Chinese because most learners relied heavily on the teacher's sentence by sentence explanation on classical Chinese [2] and tend to learn the content only by rote without comprehension [3] [4] [5].

On the other hand, studies have explored the effectiveness of integrating the flipped learning strategy into course design, and studies have revealed that learning technology may play an important role in interactive flipped classroom learning [6] and facilitate the application of flipped classrooms [7]. However, among the current studies, few studies has investigated the effectiveness of applying learning technology to assist classical Chinese learning for for teenage students with a flipped classroom approach.

Hence, the researcher aimed to conduct a series of study through several research stages to investigate how the use of learning technology could foster classical Chinese flipped learning. In the previous study [8], the researcher adopted survey questionnaire to conduct needs analysis of targeted students and instructors for understanding their perceptions of using learning technology for classical Chinese learning. In this study, the researcher had developed the Chinese learning system based on the previous research results and conducted a quasi-experimental evaluation to investigate whether the developed system could support a flipped classroom for classical Chinese learning for senior high school students in Taiwan.

A. Research Questions

The research questions of the study are: 1) Could the developed system combined with the flipped classroom approach promote learners' Chinese learning performance? 2) Could the developed system combined with the flipped classroom approach promote learners' Chinese learning motivation? 3) How do students and teacher perceive using the developed system to assist flipped classical Chinese learning?

II. LITERATURE REVIEW

A. Technology enhances Chinese learning

Studies have explored the effectiveness of using learning technology to enhance Chinese ability. For example, Chen and Chou [9] adopted a PDA-based learning system to assist overseas students in learning Chinese; Hsieh [10] adopted a mobile writing system to enhance primary school learners' rhetoric ability; Chang et al. [11] used a mobile learning system to support Chinese teaching and reading activities. Edge et al. [12] used a mobile-based system to help university students learn Chinese vocabulary. Tam and Cheung [13] implemented an e-learning platform to assist non-Chinese speakers in learning Chinese characters in the correct stroke sequence through interactive learning games on mobile devices. The abovementioned studies show the potential of integrating educational technology into Chinese learning.

B. Flipped classroom learning strategy

In the flipped classroom instruction, students are encouraged to study course materials prior to the class, and they have to come to the class prepared [14] [15]. Besides, students have to play the roles as self-paced learners. Moreover, teachers shift their role from instructors to information givers [16] and students could make full use of the developed technology provided from instructors to achieve as active learners [17]. Studies have explored the effectiveness of integrating the flipped learning strategy into course design and the findings revealed that adopting a flipped classroom has a positive learning effect on students' learning performance, and the use of learning technology facilitates the application of flipped classrooms [7]. While, the related work also indicated that some learning factors should be considered when exploring how flipped classroom strategy fosters learning. For example, how the learning technology could support students to learners before and in the class, how the teachers could adopt emerging technology tools for flipped classroom learning, and how to implement learning system to help teachers and students to achieve high order think performance [17].

III. METHODOLOGY

The study adopted comparative test data to report on the performance of learning classical Chinese with the flipped classroom approach in two learning scenarios, with and without the developed system. The experiment was conducted for a period of about two weeks (50 minutes for a class and five classes for a week). The learners in the experimental group (N=29) learned classical Chinese with the flipped classroom learning strategy with the assistance of the developed system, while the control group (N=27) adopted the flipped classroom learning strategy without using the developed system. A paper-based Chinese test was conducted before and after the experiment as the learning pre-test and post-test. After the experiment, questionnaires and interview were administered to collect the learners' feedback.

A. Experiment design

The experiment was conducted as followed: Before the first class, the students of the two groups were required to complete paper-based learning sheet before the classical Chinese class. The answers for the learning sheets could be found in the developed system or text books. During the formal class time, the students were encouraged to demonstrate how they were familiar with the targeted contents, and the instructor highlighted additional learning information that they had missed or concepts that were difficult to understand. The only difference between the experimental group and control group was that the learners in the experimental group were provided with the system for preview work, while the learners in the control group previewed the lesson with course textbooks. The process of

adopting the experiment is presented in Figure 1. The Figure 2 demonstrates the processes of how the learners learned to use the system during the preparation stage.

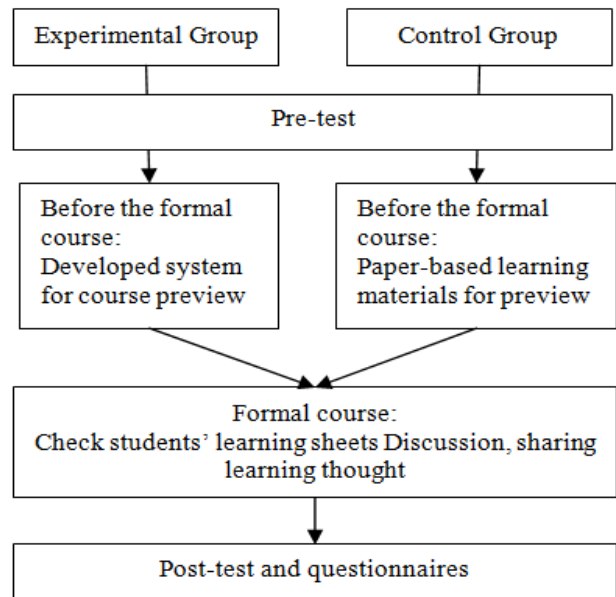


Figure 1 Experiment process



Figure 2 The learners were learning to operate the developed system

B. The Pre-test, Post-test and questionnaires

The pre-test and post-test consisted of multiple-choice questions related to the background knowledge of the targeted lesson. The items in the test were validated by the cooperating Chinese teacher. The total score of the test was 100. The purpose of the pre-test and post-test was to help the researcher understand how much did the students gain through the experiment.

The questionnaires consisted of items on a five point Likert scale (from 5 to 1: strongly agree, agree, neutral, disagree, strongly disagree) and multiple response questions to investigate how the learners perceived the design of the developed system and integrating the flipped classroom strategy into their classical Chinese learning. Besides, the questionnaires also included the open-ended questions regarding how the students perceived the experience of learning Chinese with the system and flipped classroom learning.

C. The learning sheets

The paper-based learning sheets which were designed by the Chinese instructor and the purpose of the learning sheets was to exam learners' performance of each class. The questions in the learning sheets focused on examining how the learners understood and were familiar with the target classical Chinese learning materials. The students had to hand in the learning sheets to the teachers at the beginning of each class.

IV. DATA ANALYSIS

A. Students' Chinese learning performance

The homogeneity of variances was assessed by the Levene's test, and the results confirmed that the data met the equality of variance assumption ($F=0.12$, $p=0.914$). According to the results of paired samples t-test, both groups showed improvement on the post-test and achieved significant difference (Experimental Group: $p=0.00$; Control Group: $p=0.02$). However, the ANCOVA results showed that there was no significant difference in the post-test scores of the experimental group and control group.

B. Questionnaires

The questionnaire results for the learners' reflections on their participation in the experiment are presented in Table 1. In all, the general evaluation by the learners was positive and the students reflected that they could use the developed system in their free time. According to the questionnaires, more than half of the learners visited the developed system twice a day, and the participants reflected that the interactive classical Chinese exam in the system promoted their learning motivation and helped them study and memorize the classical Chinese contents in a more relaxed way. Besides, both groups were positive about learning with the flipped classroom approach, and it was noticed that the learners in the experimental group had higher average scores than those in the control group for the questions 2: The learning way for the past two weeks enhances my motivation in classical Chinese learning. (Table 1, Experimental Group=4.00; Control Group =3.33).

C. Interview results

According to the interview data, the learners in experimental group revealed that it was very convenient to preview the learning contents through mobile devices when they were reading on the bus, and they were more engaged in studying classical Chinese because of the flexible and comfortable learning atmosphere during their self-study time. While it was noticed that the students had Internet connection problem and the prohibition of the use of mobile phones by their parents. Some learners mentioned that they only had very limited time to use the system for learning at

home because their parents do not like them to use mobile phones too often, and those students thus had limited usable Internet access.

As for the comments from the control group, the students mentioned that the flipped classroom learning method enhanced their memory of the new lesson, and they concentrated more on the classroom discussion than before. However, some students in the control group reflected that they were not comfortable about the flipped classroom learning because they felt stressed about previewing the lesson for every class. The students suggested that this kind of flipped classroom learning could be adopted, but not too often. The researcher summarizes the interview feedback from learners in Table 2.

Table 1 Questionnaire results from the two groups

Items	C.G. E.G.	
	Average	Average
1. I like the learning way in Chinese class for the past two weeks.	4.04	4.00
2. The learning way for the past two weeks enhances my motivation in classical Chinese learning.	3.33	4.00
3. The learning way for the past two weeks promotes my Chinese knowledge.	3.84	3.89
4. The learning way for the past two weeks helps me understand classical Chinese more easily.	3.69	3.76
5. The learning way for the past two weeks helps me understand the new Chinese words and sentences.	3.67	3.72
6. The learning way for the past two weeks helps me memorize the classical Chinese contents.	3.73	3.67

*Experimental group: E.G.; Control group: C.G.

Table 2 Feedback from the experimental group
Advantages of using the system with flipped classroom learning

·	I think this learning way is quite interesting! It is fun and good. I am more motivated in learning.
·	It is convenient for me to read and practice classical Chinese memorization.
·	I am engaged in practicing Chinese learning. - Learner36
·	I want to study the content on the bus, but I need an Internet connection
·	It is convenient to study with the phone but my eyes are tired after reading for a long time with the system
·	I cannot use computers or mobiles at home because my parents do not allow me to do this.

D. Course observation

According to the course observation from the Chinese teachers, it was found that the learners in experimental group performed more active in doing the preview work than the learners in control group did. The learners were asked to do the previous work before the class, those who were provided with the developed system as a learning assistant had better learning motivation to complete the previous work actively than the learners who used traditional textbooks as pre-course reading media. Besides, the teacher also found that if she did not put strong emphasis on asking students to do the preview work, then

the learners in control group did not pay much attention to doing the preview work. The learners in control group with were passive in their learning compared to the experimental one.

V. DISCUSSION AND RESULTS

This is a multiphase study which aims to investigate how to provide learners with an effective method to acquire classical Chinese through integrating learning technology with the flipped classroom approach, which few studies to date have focused on. In this study, the researcher continued the previous pilot survey, developed the system accordingly and evaluated it in a senior high school in Taiwan to understand targeted learners' and instructors' perceptions of using the developed system for classical Chinese learning and teaching. The findings revealed that the students who learned with and without the developed system together with the flipped classroom learning all improved their Chinese performance. However, it was noticeable that the learners who used the developed system showed better motivation in terms of self-directed preview learning, while those who only learned with the traditional materials tended to be more passive, and did the previewing only when the teacher reminded them to do so. Besides, from the analysis of the questionnaire results, it was revealed that the learners in the experimental group that adopting the developed system has better motivation to preview the classical Chinese contents. The uses of the developed system might benefit flipped classroom teaching and learning by promoting active learning opportunities and eliciting students' self-activated learning in the preview work. The finding is in accordance with previous study [6].

However, it should also be noted that when instructors intend to apply mobile devices or learning technology to facilitate the value of flipped classroom learning, it should take the targeted learners' cultural background and the availability of supporting learning devices into consideration, and also to provide the learners with Internet authorization. The strategy of flipped classroom aims to ask the learners to do the preview at home before the course, and the teachers should carefully consider whether the learners at home were able to do the preview work with availability learning devices so as to prevent the flipped classroom from exacerbating the digital divide such that some low achievers or learners with less family support may lose the chance of learning.

The study proposed the future work as follows: (1) The researcher aims to adopt the developed system for adult learners for better understanding of whether learners of different age groups have different perceptions of using the developed system to support a flipped classroom. (2) More interactive functions such as game-based learning interaction will be included in the system. (3) The

researcher will keep improving the learning contents in the system and including interactive multimedia factors in contents presentation. (4) The teachers are suggested to adopt the system with more teaching strategy to examine whether integrating the developed system with other pedagogy could promote learners' Chinese learning. More research results from this series of study will be shared in the near future.

ACKNOWLEDGMENT

The research project is funded by the Ministry of Science and Technology, in Taiwan, 104-2511-S-032-008. The author would like to thank for the help from the Chinese teacher, Renee Hwei-Hsuan Wang, for conducting the experiment evaluation.

REFERENCES

- [1] Gao, Y. (2008). *Modern Chinese and Chinese Literacy*. Taipei : Show We Information Co., Ltd.
- [2] Tang, Y H. (2011). The Analysis of Classical Chinese Examination Questions of the Basic Competence Test for Junior High School Students(2001 to 2010). M. A. Dissertation, National University of Taiana, Taiana.
- [3] Peng, N. S. (2008) . A Study of the Teaching and learning of Wen Yan Wen and Bai Hua Wen. Taichung: Nationa l Taichung Normal University Ph. D. dissertation (Unpublished)
- [4] Lee, H. L. (2010). Let the spirit of inquiry into the teaching of classical Chinese. *Journal of the Chinese and Foreign/Wes fern Educational Research* 420,110-111.
- [5] Chi, L. C. & Chiou, G. F (2015). The Comprehension Process of Reading Classic Chinese Texts. *ournal of Chinese Language Teaching*. 12(2), 51-74.
- [6] Bishop, J. L. & Verleger, M. A. (2013). The Flipped Classroom: A Survey of the Research. 120th ASEE annual conference & exposition. June 23-26.
- [7] Davies, R. S., Dean, D. L., & Ball, N. (2013). Flipping the classroom and instructional technology integration in a college-level information systems spreadsheet course. *Education Technology Research Development*, 61, 563-580.
- [8] Wang, Y. H.(2015). A Preliminary Study of Integrating Flipped Classroom strategy for Classical Chinese Learning. *Proceeding of the 15th IEEE International Conference on Advanced Learning Technologies (ICALT2015)*, Taiwan, 238-240
- [9] Chen, C-H., & Chou, H-W. (2007). Location-aware technology in Chinese language learning. *IADIS International Conference Mobile Learning*, 189-193.
- [10] Hsieh, W-J., Chiu, P-S., Chen, T-S., & Huang, Y-M. (2010). The effect of situated mobile learning in Chinese rhetoric ability of elementary school students. *The 6th IEEE International conference of Wireless, Mobile, and Ubiquitous Technologies in Education*, Los Alamitos, CA: IEEE Computer Society, 177-181.
- [11] Chang K. N., Lan, Y. J., Chang C. M.,& Sung Y. T. (2010). Mobile - device - supported strategy for Chinese reading comprehension. *Innovations in Education and Teaching International*, 47(1), 69-84, DOI: 10.1080/14703290903525853
- [12] Edge, D., Searle, E., Chiu, K., Zhao, J., & Landay, J. (2011). *MicroMandarin: Mobile language learning in*

- context. Proceedings CHI 2011, Vancouver, BC, Canada, 23-29.
- [13] Tam, V., & Cheung, R. L. F (2012). An Extendible and Ubiquitous E-learning Software for Foreigners to Learn Chinese on iOS-Based Devices. ICALT '12 Proceedings of the 2012 IEEE 12th International Conference on Advanced Learning Technologies, Washington, DC, US, 46-48.
- [14] Alvarez, B. (2011). Flipping the classroom: Homework in class, lessons at home. Learning First. Retrieved December 11, 2014 from <http://www.learningfirst.org/flipping-classroom-homework-class-lessons-home>
- [15] Furio, D., Gonzales, S., Segui, J. M. Y. C. (2013). The effects of the size and weight of a mobile device on an educational game. *Computers & Education*. 64(2), 24-41.
- [16] Pardo, A., Perez-Sanagustin, M., Hugo, A., Parada, H. A., & Leony, D. (2012). Flip with care. Proceedings of SoLAR southern flare conference, 21-25.
- [17] Hwang, G. J., Lai, L. C., Wang, Y. S. (2015). Seamless flipped learning: a mobile technology enhanced flipped classroom with effective learning strategies. *Journal of Computers in Education* (2015) 2(4):449-473