

Key-Image Picture-Based Approach for Teaching Chinese Character via Online Distance Learning to Chinese as Foreign Language Learners

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Abstract: This study aimed at applying key-image pictured-based approach to teach Chinese-characters for Chinese as foreign language learners in the environment of online classroom. It was a quasi-experiment design. 65 ages 10-12 school children from an elementary school of southern California participated in the research, 32 students in the experimental group and 33 pupils in the control group. The intervention of key-imaged pictured-based approach of teaching Chinese-characters in the online classroom was applied to the experimental class over a 15-lesson period in 3 months. The control class accepted Chinese language class without the intervention in the regular classroom in the same period of teaching schedule. The result of a detailed one-way ANCOVA demonstrated that the intervention of key-imaged pictured-based approach of teaching Chinese-characters with online environment in the experimental class contributed significant grow in vocabulary skills.

Key words: Key-image pictured-based approach, online classroom, Chinese-characters, Chinese as foreign language learners, school children, vocabulary skills.

1. Introduction

Many students in America are eager to study Chinese language nowadays, but they meet the challenges while learning it, they lose interest and give up after one or two semesters [1]. Although some of students are in advanced level Chinese classes, they have difficulties in Chinese reading and writing [2]. Thus, these students eventually find Chinese language getting more and more difficult to upgrade their level [1].

The gap between Chinese and English has a substantial influence on the nature and procedure of how characters can be introduced, making the issue a persistent focus of study for many years [3]. Unlike alphabetical writing system, Chinese language is as graphic units which is in a great quantity but cannot be simply associated with a particular sound or meaning [4]. Chinese characters become a mainly challenge for Chinese as foreign language learning (CFL) learners to grasp a broad knowledge map to connect the graphic features and semantic concepts of many characters into their working memory [5].

Learning Chinese characters is a challenging task for CFL learners. The strategies applied to recognize distinct characters could be different between native and non-native students. American readers treated

characters as symbolic signs and thus used a diverse approach of both phonological and visual processing, but the natives applied a phonetic way [6]. The visual influence of Chinese characters identified to be a crucial determinant in a processing approach of American students [7].

Most pictographic connect composites and understandable words with high inspiration are best described by six categories of character [8]. The inductive approach was underlined because of the extensive presence of pictographic characters. However, some inductive approach to memorize characters is seldom applied by learners on the elementary level. The reason was that pictographic characters often presented on this level were not proper designed for a memorization structure [9].

The approach to help language teachers facing the differences among languages is to develop both general skills for teaching all languages and a particular strategy for specific languages such as Chinese. Benefiting by the high-tech revolution, computer assisted language learning (CALL) has significantly developed the language teaching environment [10]. However, the main difficulty for the conventional CALL teaching acknowledged by most language instructors is its incapability to offer linguistic interaction [11]. Nevertheless, the multimedia structure corresponds to learning principal holding that active employment causes prolonged and deeper retention. Furthermore, it appeals to a crucial theory of anthropological learning: visual memory [12].

Technology has developed and increased foreign language education in many features. These variations could be found in the possibilities in which foreign language are conducted in the traditional classrooms vs. online. More significantly, these transformations could be found in how foreign language are instructed with integrating technology, which has been discovered to enhance teaching and learning foreign language in many efficient approaches. This is mainly factual about the instruction of Chinese characters [13].

Accordingly, the purpose of this study aimed to apply the key-image pictures to help CFL students to learn Chinese characters more effectively in an elementary school in southern California. Moreover, the study integrated online distance learning to motivate the learners to learn and memorize Chinese characters efficiently and productively.

2. Key-Image Picture-Based Approach for Teaching Chinese-Characters

Keyword mnemonic by using both visual and verbal mental imagery relates a word to be memorized with some formerly acquired knowledge [14]. The keyword method's efficient use has been described to be mainly dependent on the proficiency level of L2 learners, enabling associations to be built with L2 vocabulary with which they are already familiar [15]. A survey with 29 first-year university learners of CFL showed the student applied many strategies of learning characters, including rote repetition and creating personal stories as to how the characters looked or sounded [16]. A study with 65 beginning CFL learners in the US as to their Chinese character learning strategies, and it presented that the use of graphic strategies and memory strategies (learned graphic components) ranked as the top two categories. Accordingly, the strategy of use key-image pictures can help learners on character learning, especially for beginning CFL learners. The ways to use key-image pictures include learner's active association or passive association which provides key-image pictures as learning materials [17].

A study of graphic association with Chinese characters was conducted to 90 CSL students. The teaching materials included 'directly associated image' and 'explanatory image'. The directly associated image was to allow learners to think meaning of characters by key-picture (see Fig. 1). It is 心 (heart). The form of “心” looks like a shape of a heart; the three dots are the heart's veins [18]. The explanatory image was to make learners to think font of characters by key-representation but needs to provide caption to enable students understand meaning. The result showed that the former approach was better than the latter. Accordingly, this study applied directly associated pictures as key-image picture to help CFL students on learning

Chinese characters.

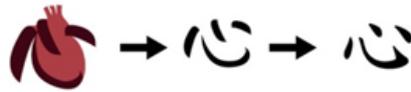


Fig. 1. The example for the three-stage character-based instructional framework.

3. Distance Education in Learning Chinese

The learning environment is important for learners (learning experience), teachers (practice), technology planning and sustainability, and in this context, the growing accessibility of handheld and wireless devices triggers thoughts of their function and benefit in the curriculum [19]. In a report published by the U.S. Department of Education in 2010, the study found that K-12 students in online conditions performed moderately better on average than those learning the same material by means of traditional face-to-face teaching [20]. A research of Chinese online program with CFL students in the US was conducted for one semester. The result showed that instructional technologies provided substantial advantages and affordances related to growing and supporting creative, collaborative, critical, and communicative abilities within learning surroundings [21]. Students who accepted technology-mediated instruction learned Chinese characters more effectively than learners in the traditional classroom [22].

Accordingly, the study aimed to integrate Chinese character-based instruction and technology. The key-image picture-based approach was applied to online distance class of learning characters. This study overcame the limitation of traditional paper-based materials. Instead, the material of creative image association was conducted to implement instructional modes of use characters to make words or sentences. Therefore, this study investigated the effectiveness of enhancing CFL learners to learn Chinese characters efficiently through key-image picture-based approach in online distance learning class.

4. Methods

The study was a quasi-experiment design with non-equivalent control groups. The research treatment of Chinese character-based instruction with key-image picture-based approach was implemented to evaluate CFL learners' outcome of literacy and vocabulary abilities. The independent variables were CFL students who were assigned randomly to an experimental class and a control class. The dependent variables were a pre-test and a post-test to evaluate CFL students' learning effectiveness. The control variables were instructional time and contents.

4.1. Participants

The experiment was taken place in an elementary school in San Diego, America. 65 students who were ages 10-12 participated in the study. 32 of these children were assigned to the research intervention of Chinese character-based instruction with key-image picture-based approach in the on-line distance class as the experimental class (EC). And the rest 33 were allocated to the control class (CC), which was in the regular Chinese language class. These students were in the fifth grade, which was selected as the target group because they started learning Chinese language as the compulsory subject in terms of school's regulation. All the students were CFL novel learners, who were Asian, Chinese, Mexican, African and Caucasian American. There were 39 girls and 26 boys; the sex ratio was about 6:4.

4.2. Research Intervention

The Chinese character-based instruction with key-image picture-based approach in both classroom and online class had 5 units with 200 basic characters (etc., family, date, food, travel, and environmental protection), which were implemented over 15 lessons for 3 months, one lesson was 45 minutes. The material was designed based on key-image pictured-based on Chinese characters. The instruction in the online class applied the Chinese character-based with key-image pictures to start every unit. Adobe Connect was applied as the platform for the online environment (see Fig. 2). The procedure of conduction was character-based with key-image pictures, making words and phrases, making sentences, and a complete conversation (see Fig. 3). In contrast, the control class did not take any interventional instructions. However, in order to parallel variance motivation, expectations and placebo effects to measure improvement, the study applied an active control class [23]. The control class also had 15 lessons for 3 months with Chinese language learning in the regular classroom. The teaching material was designed based on 200 basic characters with 5 units as the experimental group, but key-imaged pictures and online approaches were not applied to the control class. The instructional steps of the control class were to start Chinese characters, vocabularies, sentences, and a complete conversation, the same procedure as the experimental class.



Fig. 2. The scenario of the on-line class.



Fig. 3. The process of the instruction.



Fig. 4. The system of Chinese-character literacy test.

4.3. Chinese-Character Literacy Test

The literacy test examined whether the students could recognize Chinese characters, pronounce them, and make them as words, phrases, or sentences. It was an on-line test, which withdrew 50 words in the 200 basic words. The system showed a character on the screen each time for 15 minutes (see Fig. 4) [24]. The participant must utter the character and make it as a correct word. The system recorded the answer automatically, which allowed the students to play and delete the data. The test was applied to both pre-test and post-test.

5. Results

The 65 students in both the experimental class and the control class attended the Chinese character literacy test. Except 3 invalid samples, the valid respondents were 30 in the experimental class (93.75%) and 32 in the control condition (96.97%) as shown in Table 1. The total valid respondents were 62 students.

Table 1. Descriptive Analysis of Sample

Groups	Gender	N	Valid respondents
EC	Boys	18	30 (93.75%)
	Girls	12	
CC	Boys	20	32 (96.97%)
	Girls	12	

5.1. Outcome of Literacy and Vocabulary Test

In total, there were 50 Chinese characters in both pre-test and post-test. It was 50 items in the test. The grading was 2 points for each item including 1 for speaking and pronouncing the character correctly (literacy) and 1 for making a word correctly (vocabulary). The full score was 100. Table 2 shows the descriptive analysis of the pre-test and the post-test. In general, the students in both condition progressed over 15 lessons. The mean of the pre-test for experimental class was 2.67, and the mean of the post-test developed to 45.63. The mean of the control class was 2.34 in the pre-test up to 36.09 in the post-test. In the other words, the progression of the literacy for the experimental class was 24.07 characters with 18.9 words. And the control class was 19.53 characters with 14.21 words. Comparatively, learning effectiveness of the experimental class showed better result than the control class.

Table 2. Descriptive Analysis for the Literacy Test

Sections	Groups (N)	Tests	Mean	SD
Literacy	EC (N=30)	Pre-test	1.63	2.85
		Post-test	25.70	12.16
	CC(N=32)	Pre-test	1.47	2.27
		Post-test	21.00	10.56
Vocabulary	EC (N=30)	Pre-test	1.03	2.08
		Post-test	19.93	9.17
	CC (N=32)	Pre-test	0.88	1.77
		Post-test	15.09	8.09
Total	EC (N=30)	Pre-test	2.67	4.90
		Post-test	45.63	21.03
	CC (N=32)	Pre-test	2.34	4.00
		Post-test	36.09	18.38

5.2. Paired-Sample T-Test

In order to know the detail of literacy' performance of the learners, a paired-sample t-test was applied to examine the number of Chinese character and words which they acquired and could use. Table 3 shows that both two classes had a significant progression ($p < 0.001$) on overall score, literacy and words, indicating the learners' result of pre-test and post-test was a significant difference. The outcome of the post-test was higher than the pre-test.

Table 3. Summary of Paired-Sample t-Test

Test	Groups (N)	Mean	SD	t
Literacy	EC (30)	24.07	10.48	12.58***
	CC (32)	19.53	10.01	11.03***
Vocabulary	EC (30)	18.90	8.16	12.68***
	CC (32)	14.22	7.64	10.53***
Overall score	EC (30)	42.97	18.28	12.88***
	CC (32)	33.75	17.38	10.98***

*** $p < .001$

5.3. Analysis of Covariance (ANCOVA)

A One-way ANCOVA was conducted to determine a statistically significant difference between experimental and control groups on the post-test controlling for pretest. Table 4 shows the result. Initial testing of the homogeneity of the regression coefficients in the group, it showed no significant difference between the two groups in the pretest ($F = 1.292, P = 0.260 > 0.05$), indicating that no significant effect of the two groups on the post-test after controlling the pretest. In the further analysis of covariates, the result of homogeneity of variation test ($F = 0.819, P = 0.722 > 0.05$) indicated that the two groups had the same variation with the same quality. The result of the final analysis of covariates showed that there was a significant effect of the two groups on the post-test, $F(1, 59) = 4.13, p < .05$, indicating that the score of experimental group on the post-test was significant higher than the control group.

Table 4. Summary of One-Way ANCOVA about Tests

Source	Type III Sum of Squares	df	Mean Square	F	Sig.
Group	57703.62	1	57703.62	199.09	.000
Pretest	6199.56	1	6199.56	21.39	.000
Group*Pretest	1198.30	1	1198.30	4.13	.047
Error	17100.12	59	289.83		
Total	127460.00	62			

* $P < .05$

Consequently, a One-way ANCOVA was conducted to determine a statistically significant difference on the literacy and vocabulary tests. There was no significant effect of the two groups on the literacy test ($F = 3.041, P = 0.086 > 0.05$). However, there was a significant difference of the two groups on the vocabulary test, indicating the score of the experimental group was higher than the control group. After the intervention, the experimental group performed better ability on lexis than the control group.

6. Conclusion

The study aimed at applying the key-image pictures to assist CFL students' Chinese literacy and vocabulary skills more effectively in the online classroom in an elementary school of southern California. This was a quasi-experiment design with two types of classes, the 32 students in the experimental class with

the online approach and the other 33 pupils in the control class. In total, the effective sample was 62 ages 10-12 school children. The intervention was conducted over 15 lessons in 3 months.

It can be concluded that after Chinese language classes for 15 lessons, both the experimental and control classes was improved on the pretest and the post-test. However, the experimental class was performed significantly better than the control class. Regarding literacy, both the two classes were progressed on the pretest and post-test. Nevertheless, in terms of the outcome of the ANCOVA, both had no significant difference. About vocabulary skill, both the two classes were improved on the pretest and the post-test. Also, the experimental class performed better than the control class.

In summary, the key-imaged picture-based approach with the environment of online classroom was able to enhance CFL school children's literacy and vocabulary skills. Specially, the ability of vocabulary showed significant learning effectiveness.

7. Implication

The study is to contribute the field of CFL educators and instructors to understand the way of applying technology to young generation for learning Chinese characters effectively. However, in terms of the U.S. Department of Education in 2010, instructional technologies offered substantial advantages about supporting creative, collaborative, critical, and communicative skills within learning settings [20]. The design of the teaching materials and online environment was limited to assist CFL children learning Chinese characters based on creative approach. The further study may develop more cooperative, interactive and unrestrained surroundings to conduct key-imaged pictures in the online distance class assisting CFL students learning Chinese characters.

Additionally, evaluation can be integrated into the system in terms of technology-based learning for Chinese language online class [25]. Accordingly, the system of formative assessment to assess every single unit can be designed for future research and instruction.

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