This paper presents an innovative and flexible approach to teaching Chinese characters with limited teaching resources. It begins with a review of Chinese character pedagogy. Next the research proposes the theoretical framework of teaching characters utilizing Liu Shu and further points out three concepts that correspond to this teaching approach. First, the theory of “Liu Shu” can be combined with the technique of “wild association” in character deconstruction and memorization. Second, technological support is becoming necessary in the teaching and acquisition of Chinese characters. Third, input (recognition) initially precedes output (writing). The paper concludes by discussing the pedagogical implications of teaching Chinese characters in the existing TCFL (Teaching Chinese as Foreign Language) curriculum through more effective methods which include the following: connecting the form, sound, and meaning in steps, designing in class and out of class exercises, instructing students to memorize characters in ways proven to be effective, implementing the use of supplementary materials, and designing assessment tests based on character acquisition. A survey on the experience of studying Chinese characters among college CFL students at two different proficiency levels was given and analyzed to test the efficacy of Liu Shu-based teaching approach.

1.0 Introduction:

Teaching Chinese characters is a challenging but integral part of teaching Chinese as a foreign language in the United States. Scholars of language have long been interested in the acquisition and cognition of Chinese characters and the pedagogy of exploring and analyzing the most effective ways of teaching them. According to the overview articles written by Chunyan Wei and Qingxia He (2012), there are different views and approaches of teaching Chinese characters. Among the most common are a focus on Hanzi-components, and an emphasis on

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1 This paper has benefited from Professor Kunshan Carolyn Lee and Professor Pauli Tashima for their insightful comments. Special thanks go to Ms. Judith Norten for her detailed proofread and valuable suggestions. All errors are my own.
combinations of form, sound, and meaning. Regarding this teaching philosophy, Xiaobing Zhou (1999) proposed the principal of “Input Separated from Output” (or recognition by reading separated from writing.) Xianjun Pan (2005), Xin Jiang (2006) and Liping Xiang (2008) further tested and verified this theory through experiments, and then summarized a teaching model in TCFL on an elementary Chinese level. “In its initial stage, emphasis is placed on recognition rather than writing; in the intermediate stage, the emphasis focuses on more recognition and more writing, and in the final stage, the merging of recognition and writing.” Hanzi-components based teaching is recognized as the most effective approach and is considered to be the mainstream method of Chinese character teaching approaches. Juefei Bian (1999) pointed out that there needs to be built a more effective standard character grade outline based on word ability by following the sequencing of single characters preceding integrated characters.

With regard to teaching methods, there is heated discussion on the validity of employing the theory of “Liu Shu”2 and whether or not it is currently relevant in the teaching of Chinese characters. Many researchers agree that most pictographic characters, associate compounds and self-explanatory words with high motivation are best explained by “Liu Shu”. The inductive method was also highlighted because of the wide existence of pictographic characters. Some research results, however, showed that the strategy of using the inductive method to memorize characters is rarely used by students on the elementary level. The reasoning was that picto-phonetic characters usually introduced on this level are not well designed for a memorization system. Additionally, Xiangping Li (2006) evaluated a method of explaining character structures by Xin Shuo Wen Jie Zi (A new Analytical Dictionary of Characters). In his paper, the technique of “Joking Remarks on Characters (xi shuo han zi)”3 or “Wild Association (qi te lian xiang)” (by Li, Weimin 1994) in character deconstruction and memorization was suggested to be most effective when applied and controlled moderately in character memorization.

Previous studies of character learning methods and teaching pedagogy were primarily designed for specific character or writing

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2 “Liu Shu” is considered to be the earliest and the most authoritative theory on the formation of Chinese character. "Liu Shu" was first seen in Rituals of Chou published in the Warring States period (475 BCE-221BCE). It was further described in Shuo Wen Jie Zi by Xu Shen in the Eastern Han Dynasty (25CE-220CE). "Liu Shu" analyzed the various ways in which Chinese characters were generated, including pictographics, self-explanatory, ideograph, semantic and phonetic compounds, mutually explanatory and phonetic loan.

3 It refers to deconstructing a character freely in order to explain the meaning of the character.
Teaching the Chinese Language

39 courses and adapted for a number of Chinese programs in United States. The issue with this was that most of these designs failed to consider the fairly limited curriculum and teaching resources available to those involved in teaching situations. The main purpose of this paper is to concentrate on creating effective and flexible teaching methods in which the form, sound, and meaning of Chinese characters are scientifically and logically explained and connected regardless of available resources. In doing so, students can get easy acquisition of interrelated characters within a system, the reasoning being that a systematic curriculum design might shed light on and somewhat facilitate Chinese character teaching regardless of the availability or lack there of teaching resources.

This paper is organized as follows: Section 2 proposes the theoretical framework of characters teaching approach in accordance with the theory of Liu Shu; section 3 presents the three teaching methods according to the Liu-Shu-based teaching approach; section 4 presents a practical curriculum design using the above teaching approach; section 5 describes and analyzes the data of the survey collected in second-year Chinese courses and verifies the value of the proposed approach in teaching Chinese characters.

2. The Theoretical Framework of Characters Teaching Approach

2.1 Discussion: Is “Liu Shu" Applicable in TCFL?

It is accepted that the theory of “Liu Shu” plays an important role in the history of Chinese philology. Implementing Liu Shu, the author of Shuo Wen Jie Zi first presented an effective method of research on characters, which is the explaining of meanings of characters by analyzing their forms. The radical indexing system for Chinese characters which evolved in later generations also derives from Liu Shu. Therefore we can deduce that Liu Shu has had great significance in the developments of philology, critical interpretation of ancient texts, phonology and the evolution of and editing of dictionaries. If we attempt to utilize Liu Shu within the teaching framework of TCFL however, we must raise the following questions: Is it meaningful to apply this theory to TCFL and is it feasible to expect CFL students to learn characters under the current theoretical framework of instruction?

There is ongoing question and debate concerning the value of teaching Chinese characters in conjunction with teaching the spoken language. The answer to this question relies on the level of proficiency a particular student desires to attain. If a student’s goal is to have basic understanding of spoken Chinese in order to, for example, function more independently in occasional meetings where Chinese is the primary language of communication or while vacationing in China, the
level of skill they wish to attain will obviously be quite different from the level of mastery a person will aspire to if their goal is to relocate to China or to become a scholar well-versed in Chinese history and literature. We can conclude, therefore, there is no one answer to this question and debate.

Unlike alphabetic writing, Chinese characters are combinations of form, sound, and meaning. The structure of Chinese characters can be studied from two aspects: roots and status principally based on characters' development and form. In teaching the Chinese language, the Latin term “roots" refers primarily to the inherited traditional theory of "Chinese characters", which is Liu Shu. Here we see the creation of new Chinese characters, or Liu Shu whereby characters are ultimately based on and classified by roots from ancient Chinese character glyphs. Recent research has focused mainly on the components observed in current character status, whereby characters are established by using a connection between the word and the word in accordance with the component principle. This results in a reflection of the systemic characteristics of characters, and provides the basis for the analysis of Chinese characters structure and phonetic elements. The most common teaching method currently used remains components-based teaching.

Before one can efficiently address and attempt to answer the questions about the significance and application of Liu Shu in the teaching and mastery of Chinese characters, the six approaches of generating characters by Liu Shu must be understood.

The term "phonetic loan" refers to the borrowing of another character with its sound to represent a new meaning. For example, "不 (bù, not) " is a negative adverb in modern Chinese. Originally "不" referred to "the forms of the ovary of the calyx, and the drooping shape of the blossom." The character "不" was later borrowed to interpret the meaning of "not" which referred to the negation of an action, behavior or state. "Mutually explanatory" was interpreted differently such as meaning-based mutual explanation, form-based mutual explanation or sound mutual explanation. These characters might be attributable to the same radical words, same meanings, or same sound. The understanding of “phonetic loan” and "mutually explanatory" is still under discussion regarding their validity in creating characters. This paper argues they are not suggested to be introduced into the character teaching based on their usability and significance in reality.

The term "pictographic" refers to drawing similar graphics according to the shape of a given object’s contour, and is the most direct embodiment of ideographic characteristics of Chinese characters. For the acquisition of pictograms by students of CFL, the following Chinese
characters can be are ones regarded as some of the most representational and easiest characters to understand and memorize.

Illustrated pictographic character evolution chart

The term "self-explanatory/indicative" means to mark what people want to say with a simple symbol, usually enabling people to recognize characters at a glance or to understand them after a short evaluation. The form evolution of 刃 (rèn, blade) is shown as below. For the acquisition of self-explanatory characters for students of CFL, with a previous memory storage of pictographs coupled with a few annotations from the teacher, enable self-explanatory characters to be more quickly understood.

The term "ideograph" refers to the combining of two or more pictographs or self-explanatory characters or their mixtures to create a new character with new meaning which is easily perceived from the form. Compared with the former two building approaches, the advantage of ideographs is that there are a variety of combinations in their form, thereby allowing the expression be able to express an abstract meaning. Because of this flexibility in usage, the characters created this way are more easily understood than characters created by pictographs and/or by utilizing the self-explanatory component. The form evolution of 休 (xiū, rest) is shown below. For students of CFL, the acquisition of ideographs such as 休 requires the understanding and

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4 Adopted from Beginning Chinese written by Maiheng Dietrich, Melvin Lee and Meiqing Sun. It is to be published in 2015.

5 These pictures demonstrating the six approaches of generating characters by Liu Shu are adopted from hanziyuan.com. The same below.
familiarity with almost all pictographs or self-explanatory characters as a prerequisite.

Picto-phonetic characters were created according to "semantic plus phonetic compounds" have numerous productive advantages, among which are that they are combinations of semantic and phonetic elements. Thus readers are able to decipher their meanings by observing the form element and the pronunciation by phonetic element. The form evolution of 饭 (fàn, meal) is shown below. The left part of 饭 is the picture of a food container and the right part is the phonetic part with the original meaning of "to repeat." This combination refers to the action "eating food on and on." In modern Chinese, 饭 usually means "meal". For students of CFL, however, it is necessary for them to know the pictograms, self-explanatory characters and ideographs before beginning to learn these characters. This sequence is required because the components of picto-phonetic characters are assembled by semantic and phonetic elements and by phonetic elements which are derived from other types of characters.

In 3,500 commonly used Chinese characters, picto-phonetic characters occupy 2,612 AND accounted for 74.63% of characters most commonly used. In 7,000 universal Chinese characters, picto-phonetic characters have 5,496, accounted for 78.51% (Yu, Xia 2013). Currently picto-
phonetic characters comprise the main body of modern Chinese character categories.

The basic components used in building picto-phonetic characters are a compilation of pictoglyphics, self-explanatory characters, and ideographs. That is, 3,500 characters can be easily acquired as long as they are the characters included in the 25.37% of most the 888 most commonly used characters. Therefore, because of the limited number of picto-phonetic characters, it is imperative for instructors to find ways to help students learn and remember these most commonly used characters if students are to attain even rudimentary mastery of the Chinese language.

According to Wen, Ye Fen (1989), the 3,500 commonly used characters were roughly classified in accordance with the four methods of building characters (pictographic, self-explanatory, ideograph, and semantic plus phonetic compounds.) If the structure of a character cannot be distinguished when viewing simplified characters, then traditional characters can be substituted. The results are that 177 pictographs accounted for 3.3% of 3,500, 39 self-explanatory characters accounted for 1.2%, 971 ideographs accounted for 28%, and 2,313 picto-phonetic characters accounted for 66.7 % of 3,500 commonly used characters.

2.2 Result

We can conclude that the Liu-Shu-based teaching approach provides effective clues to character memorization. As long as CFL students are familiar with 216 pictographs and self-explanatory characters, they can be expected to more easily recognize and memorize the 971 ideographs. Because these characters comprise the main components of picto-phonetic characters, they become the essential clues necessary for the understanding and memorization of picto-phonetic characters.

Liu-Shu-based teaching accommodates the establishment of connections among characters, thereby modifying their meanings in accordance with the component principle. Both Liu-Shu-based and component-based teaching approaches emphasize the value of “splitting components” as being an effective tool in promoting the understanding of connections among meaning, form and sound. Liu-Shu-based approach emphasizes connection as opposed to placing value on separate components. For students, this facilitates their ability to grasp recognition and concept of whole characters rather than pieces of characters.
3. Application of Liu-Shu-based Teaching Approach

3.1 "Liu Shu" leads, "Wild Association" supplements

While Liu Shu has been recognized and accepted as the basis for the teaching of Chinese characters, the “wild association” theory is accepted as a valid and useful supplement. This paper provides further explanation of “wild association” which is the process of editing the story of a character based on the knowledge of the structure and components of the character. This is followed by the memorization of a group of characters in a story using the same or similar component in each character in the group. In a classroom setting, this is helpful for the activation and sustaining of interest in the subject matter, therefore stimulating student greater interest in learning. “Wild association” relies on basic knowledge of Chinese characters’ structure and components, and can only be used to enhance effectiveness of acquisition. When this knowledge is lacking, there is a disconnection,
and often student motivation and consequent memorization are compromised.

To further demonstrate this point, note that the original form of "舞" is "無". These pictographs describe a woman dancing with her hands while holding an ox tail. Later, the character "無" was "borrowed" to express and enhance the meaning of "no or not". To clarify the shape of the feet, the foot shape "舛" was added below the character "無" to form "舞" which is the meaning of "dance." However, the shape for feet, "舛" is complex and can be difficult for many students to memorize.

舞 wǔ
To dance

In order to utilize the theoretical framework of Liu-shu, students need to know that the character "舞" is a pictograph. Then they need to recognize the connection between "舞" and "無 (no/not)" in meaning, sound and form. In classroom instruction it is helpful to split pictographs into parts and then invite students to write a short story in English with the woman being the story’s main character. Based on previously acquired knowledge of the Chinese characters for sunset, ox, firewood and man, and employing common sense and imagination, the pictograph “dance” 舞 can be split into four parts: sunset, ox, firewood and man. Employing these four characters, the following story could be written. "After sunset, the hunters gathered firewood together, lit a bonfire, grilled the captured red ox on the blazing firewood, and then happily danced in the firelight as they celebrated successful hunt." Exercises such as these employ key elements of the story represented by different components of the characters. The theory behind this teaching method is that when students recall the story, prior knowledge of these corresponding word parts will be evoked and gradually students will learn to incorporate parts of characters into whole characters.
This method can also be used in memorizing a group of characters in a memory string. In order to become familiar with and master Chinese characters' structure and components, an effective tool in teaching this skill is to have students initially memorize at least two Chinese characters with similar parts and weave them together in story form. The theory is that clues in the story will remind the students of other members in the string, and as a result, if any one of them is missing, the others will hopefully evoke recall.

To explain further, "医 (yī, doctor)", "知 (zhī, to know)" and "候 (hòu, original: five days)" have the common part "矢 (shǐ, arrow)." "医" is an ideograph with "矢" and "匸" two parts; "匸" signifies a container. Then the character indicates the pulling out of an arrow from the wound. Placing the arrow into the container implies "healing." "知" and is also an ideograph with "矢" and "口" portrayed in two parts. In classic Chinese this meaning signifies speaking out rapidly and/or shooting for things with which you are familiar.

"候" (hòu) is a picto-phonetic character written as "𠳟" in classic Chinese. "人" is the form element and "侯" is the phonetic element whose original meaning is "reconnoiter." The process of splitting characters into parts in order to remember the newly introduced character "候" is initially difficult because it is unfamiliar. As is true when mastering many other new concepts, the learning of Chinese and the implementation of Chinese characters is a process. This process is best mastered with desire to learn, patience, instruction and practice. To compare Latin, on which many European languages are based, is not altogether dissimilar. While it does not employ characters, it has root words, prefixes, suffixes, tenses, etc., all of which, while often initially daunting, become a manageable skill with practice and usage.
An example of a story linking these three characters might be as follows: The doctor sometimes knows (the cause of an affliction), but sometimes doesn’t know. Here we see an example of three characters being linked in a memory string which emphasizes the related syntax function of “sometimes (有时候, yǒu shí hòu)” thereby enabling students to more easily understand the theory behind the memory string and memorize the characters used. By more actively and personally engaging in and acquiring knowledge and understanding of Liu Shu, it is hoped that students will develop a sense of “ownership” of language and take pride in their newly found ability to understand. These are primary motivators in the learning process.

3.2 Teaching Techniques
3.2.1 Recognition Precedes Writing

As stated earlier, there are currently arguments and debates over whether or not recognition and writing alone are initially a more valuable approach to learning the Chinese language. Or, is it more effective to learn characters in synchronization with the theory that recognition precedes writing? This topic argument remains part of the
debate surrounding the teaching of Chinese characters and its answer is embedded in the question of whether or not a scientific teaching plan can be designed in accordance with cognitive laws.

“Input precedes output” is a basic principle of cognitive science. This same principle applies to language acquisition. i.e., listening and reading (input) precede speaking and writing (output.) This principle is an acknowledged philosophy for almost all teachers of foreign languages, including those teaching Chinese. Because of the complexity of Chinese characters it is difficult to incorporate this philosophy teaching into a simple and concrete teaching design.

The term “Pinyin” is used when referring to written notes for pronunciation of symbols. The term “characters” is used to refer to written symbols. It is necessary for students to master the first step, acquisition, when learning Chinese characters. This recognition can seem confusing to beginning students because they are daunted by the unfamiliar composition of Chinese characters. The "unidirectional links," i.e., pronunciation of language to meaning of Chinese characters, challenges the brain to think of language acquisition in unfamiliar patterns. The brain has to recognize characters by recalling representational related entities or concepts when seeing a “word” and then write out the characters by evoking corresponding meanings by hearing sounds or thinking of character integration and ultimately, meaning.

Effective ways of utilizing the "input before output" ("reading prior to writing") theory in the teaching pedagogy are varied. Students are sometimes required to read aloud characters on selected vocabulary before the beginning of a new lesson. Their goal is to connect sounds with meanings of characters. In order for classroom instruction to be most effective, it is necessary to introduce both vocabulary and grammar at the initiation of the term. Among effective methods of teaching this skill are the conduction of drills which require students to speak only in Chinese while simultaneously utilizing visuals of characters to connect sounds and meanings with forms of characters. To supplement classroom instruction, students are expected to memorize meanings of assigned words in conjunction with viewing characters and texts. Utilizing technology, listening to assigned tapes relating to the text and character quizzes also enhance the learning process. Finally students are tested to evaluate their level of acquisition of sound and form by dictation demonstrating knowledge of character meaning through character translation as well as their reproduction.
3.2.2 Technology Support

As technology becomes more accessible and less expensive, a number of newly published and republished TCFL materials are being designed with matching online information amplification. Der-lin Chao’s New Multimedia Course for Learning Chinese Characters is currently viewed by some as a successful resource and is supplemented with technology. This series includes a textbook, workbook and corresponding online materials. The issue with this course is that instead of providing a listing of the 3,500 most commonly used characters corresponding to Liu Shu, only a sampling of these characters is offered. The work, however, does cover and explain the pertinence of Liu Shu instruction, and also provides corresponding self-assessment exercises. Radicals and strokes are also addressed.

Because immersion is the key in the learning and mastery of any language, utilization of online resources and mobile software of the students’ preference is strongly encouraged. Game-based software can also be helpful in stimulating acquisition and character mastery.

3.3 Summary

This paper supports the value of a Liu-Shu-based teaching approach and incorporates the following three points.

First, Liu Shu, the basic principal of generating characters is the basic theoretical framework of the Liu-Shu-teaching approach. In order to help students acquire characters in effective ways, students are initially taught pictographs. Then students are guided to learn associative characters by understanding their meaning by disassembling their parts in the process of memorization. Finally students are instructed to learn the picto-phonetic characters which account for almost 78% of the 3,500 commonly used characters because form elements and phonetic elements of picto-phonetic characters generate primarily from pictographs, self-explanatory characters, and ideographs.

Below is a summary of the Liu-Shu-based teaching approach, which is teaching by category then building memory storage in inverse pyramid form.
Second, "wild association" complements Chinese character teaching. First students are introduced to Chinese characters, their structures, mechanism and are then expected to gain comprehension of components in form, sound and meaning. When this has been accomplished, students are invited to promote usage of characters through creative story writing. This method can facilitate the memorization of not only single Chinese characters, but also can assist students with the formation of memory string. Characters with same components are grouped through connecting the various elements of setting and characters as they create their “story”.

Third, Liu-Shu-based teaching approach replies on the theory that "recognition precedes writing" thereby complying with the general laws of cognition. Form and sound are connected through pre-reading; sound and meaning are connected through listening and speaking; form and meaning are connected through "recognition/reading," and ultimately the connection among sound, form and meaning is completed through writing.
4. Curriculum Design

Now that the importance of teaching Chinese characters has been established, we will explore effective ways of teaching them. The following three steps, presented in sequential order, address this issue: First, students will become familiar with connecting form, sound and meaning of characters. Second, students will practice memorization during the instructional period. They will reinforce this work by outside practice employing teacher generated exercises, and any assigned textbook material and their online components. Third, teacher generated assessments to track student progress regarding character acquisition will be administered.

Current Chinese instruction is presented as follows: Each level meets three hours per week respectively on Mondays, Wednesdays, and Fridays. There are approximately fifteen weeks in each term, or forty hours per term per class, allowing instruction of five chapters.

Next is the breakdown for the design of the first semester Chinese class curriculum:

Sample of the Curriculum Design for Introduction on Chinese

<table>
<thead>
<tr>
<th>Class Hour</th>
<th>Educational Highlights</th>
<th>Emphasis on Characters</th>
</tr>
</thead>
<tbody>
<tr>
<td>Hour 1</td>
<td>Instruction on sound system</td>
<td></td>
</tr>
<tr>
<td>Hour 2</td>
<td>Instruction on sound system; Useful Expression</td>
<td></td>
</tr>
<tr>
<td>Hour 3</td>
<td>Instruction on sound system; Instruction on structure of Chinese characters</td>
<td>Introduction of first 10 pictographic characters through hand-outs; Form theoretical foundation of teaching-learning characters; Instruction in the concept of connections between form, sound, and meaning in each character.</td>
</tr>
<tr>
<td>Hour 4</td>
<td>Instruction on structure of Chinese characters; Radicals and Strokes</td>
<td>Stimulate the study interest in learning characters, for example, a game to guess meaning</td>
</tr>
<tr>
<td>Hour 5</td>
<td>Review and assessment of pinyin and character</td>
<td>Set up character out-of-class study schedule: 177 pictographic and 39 indicative characters to be acquired in first semester 10-15/weeks</td>
</tr>
</tbody>
</table>

In hour 3, the 6 categories of ways of creating characters with 10 pictographic characters are introduced. In hour 5, out-of-class study and assessment schedules are assigned. The goal is for students to learn all 177 pictographic characters as well as 39 indicative characters during their first semester of instruction. Out-of-class study is guided by a syllabus which is handed out at the beginning of the semester as well as
the handing out of materials which reflect and reinforce work accomplished in class in a given hour. Finally, assessment is accomplished through written examination.

Sample of Curriculum Design for Introduction on Chinese

<table>
<thead>
<tr>
<th>Class hour</th>
<th>Educational highlights</th>
<th>Emphasis</th>
<th>Assessment</th>
<th>Character Components Connection</th>
</tr>
</thead>
<tbody>
<tr>
<td>Pre-class</td>
<td>Preview homework</td>
<td>Read out the characters in vocabulary list; Memorize the corresponding meanings; Start to use the provided supplementary materials to learn the second 15 pictographic characters</td>
<td>Form-Meaning</td>
<td></td>
</tr>
<tr>
<td>Hour 1</td>
<td>Instruction on characters</td>
<td>Expansion drill: character deconstruction–vocabulary memorization-sentence organization</td>
<td>Preview quiz on characters</td>
<td>Sound, Meaning</td>
</tr>
<tr>
<td>Hour 2</td>
<td>Drills on characters; Instruction on grammars</td>
<td>Word card reading; Conversation in Mandarin; Reading instructions in character</td>
<td>Mini-dialogues</td>
<td>Form-Sound … + meaning</td>
</tr>
<tr>
<td>Hour 3</td>
<td>Instruction and drills on grammars; Selective examination on Chinese characters</td>
<td>Character to sentence</td>
<td>In-class: game Out of class: Review handouts with designed exercise</td>
<td>Form-Sound … + meaning Delete the…</td>
</tr>
<tr>
<td>Hour 4</td>
<td>Drills on grammar; Listening and Reading exercises</td>
<td>Character recognition</td>
<td>Review quiz on characters.</td>
<td>Form-Sound-Meaning</td>
</tr>
<tr>
<td>Hour 5</td>
<td>Drills on character writing</td>
<td>One character one story to share; Characters with numerous strokes to practice; 10 pictographic</td>
<td>Game; White board practice</td>
<td>Form-Sound-Meaning</td>
</tr>
</tbody>
</table>
5. Survey in CFL classroom

Most methods based on the flexible character teaching approach are applied in a practical teaching setting. In order to collect students’ feedback and improve teaching, a survey was given to participants and their input was used as a reference for evaluation.

5.1 Participants and Procedure for Data Collection

The present study gathered data from 2nd and 4th semester Chinese class students. These students meet 4 hours per week, 15 weeks per semester. Students are instructed to use Mandarin in oral communication when answering questions or during dialogue or narration. They are expected to recognize and read Chinese characters on teaching slides, in texts, on whiteboards, cards or hand-outs. They are also expected to write out the corresponding pinyin and characters in quizzes. More comprehensive examinations are administered and character reproduction is also evaluated. Pinyin is taught as a tool to facilitate pronunciation and perception capture. It is introduced in the first 3 classes of the first semester. Afterwards, pinyin is repeatedly checked in quizzes to ensure mastery. Simplified characters are expected requirements in reading and writing, but more complex traditional characters are only expected to be recognized when addressing text.

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The two classes which completed the survey were comprised of 29 (of 32) students from the 2nd semester classes and 14 (of 15) students from 4th semester classes. In the 2nd semester classes there were two Vietnamese descendants who had limited knowledge of characters before enrollment. The remaining students were all students for whom English is their first language, and none of them had any Chinese language background.

The textbook used for 2nd semester Chinese is *Integrated Chinese, level 1 part 1, 3rd edition*, and the one for 4th semester Chinese is *Integrated Chinese, level 1 part 2, 3rd edition*. Students were expected to master 5 lessons each semester, thus 2nd semester students had completed lesson 5 while 4th semester students had completed lesson 15 when the survey was administered.

Participants were asked to fill out a survey (appendix) containing 21 statements which focused on character memorization. For each statement, students were asked to check one of five possible choices: "strongly agree", "agree", "undecided", "disagree", or "strongly disagree." All student participants completed the survey.

### 5.2 Data Analysis and Discussion

The data collected from the survey was categorized into six compartments.

<table>
<thead>
<tr>
<th>Key Words</th>
<th>Agree: Disagree</th>
<th>Statement</th>
<th>Statements # in Survey</th>
</tr>
</thead>
<tbody>
<tr>
<td>Liu Shu</td>
<td>23:2</td>
<td>Introduction of six categories of character structure, which is Liu Shu. Enables students to gain an overall concept of character structure.</td>
<td>11</td>
</tr>
<tr>
<td></td>
<td>34:0</td>
<td>Liu Shu is helpful in memorization.</td>
<td>12</td>
</tr>
<tr>
<td>Creating Stories/Wild</td>
<td>31:1</td>
<td>It helps to memorize characters.</td>
<td>13</td>
</tr>
<tr>
<td>Association</td>
<td>24:2</td>
<td>It helps to recall and write out the specific characters</td>
<td>14</td>
</tr>
<tr>
<td></td>
<td>31:1</td>
<td>It helps to recall characters in group.</td>
<td>15</td>
</tr>
<tr>
<td>Recognition &amp; Writing</td>
<td>34:4</td>
<td>Recognition of characters is much easier than writing characters.</td>
<td>3</td>
</tr>
<tr>
<td>Radicals (components)</td>
<td>30:1</td>
<td>Radicals help to memorize characters.</td>
<td>10</td>
</tr>
<tr>
<td></td>
<td>17:7</td>
<td>Radicals can be helpful in using vocabulary dictionary.</td>
<td>17</td>
</tr>
<tr>
<td></td>
<td>16:4</td>
<td>Radicals are usually used in apps which provide students extra practice.</td>
<td>19</td>
</tr>
<tr>
<td></td>
<td>38:2</td>
<td>Copying characters helps with the memorization of the shape of characters.</td>
<td>5</td>
</tr>
<tr>
<td></td>
<td>18:7</td>
<td>Copying characters has better effects on character memorization than apps.</td>
<td>20</td>
</tr>
</tbody>
</table>
Assignments, Quizzes, Activities | 37:1 | Preview quiz checking character recognition is helpful for stimulating characters memorization. | 4 |
---|---|---|---|
| 36:1 | Quiz on writing characters helps students memorize character's shape. | 7 |
| 29:4 | Quiz on recognizing the radical of characters helps to memorize the character's meaning and shape. | 8 |
| 20:3 | The exercise of writing characters on whiteboard helps to memorize the character's meaning, sound and shape. | 9 |

Technology Support | 22:1 | Apps help with studying characters. | 18 |

### 5.3 Result

According to the results of the questionnaire, although the “proposed teaching approach” described in this paper was only partially applied to character teaching, students’ feedback to this teaching method was active and verified the practical value of this teaching approach.

Appendix:

*Survey on Character Memorization*

1. Recognizing and writing character is more difficult than listening, speaking, or learning grammar and understanding its usage.
2. Writing pinyin is more acceptable than writing characters.
3. Recognizing characters is easier than writing characters.
4. Preview quiz checking character recognition is helpful for facilitating characters memorization.
5. Assignments requiring reproduction of characters help with memorization of characters.
6. Reciting dialogue and role playing helps you consolidate memories of characters.
7. The quiz on writing characters helps you memorize characters' shapes.
8. The quiz on recognizing the radicals of characters and writing out corresponding meanings help with memorizing characters' meanings and shapes.
9. The exercise of writing characters on the whiteboard helps you memorize characters' meanings, sounds and shapes.
10. The introduced radicals help you memorize characters’ meanings and sounds.
11. The introduction of the principle of building Chinese characters helps set a base of understanding of the characters' meaning and/or basic structure.

12. The introduction of the principle of building Chinese characters helps with memorization of the characters' shapes.

13. The stories about characters created in class or independently based on knowledge of characters helps you memorize character's meanings, sounds and shapes.

14. Stories about characters created in class or independently based on knowledge of the characters help you recall characters as you reproduce them in writing.

15. Stories about characters which have similar components created in class or independently help you recall the characters in group as you reproduce either one of them.

16. Using printed or online dictionaries helps you memorize character's meanings, sounds and shapes.

17. Radicals help you find characters in dictionaries.


19. The apps which you are using to supplement your study use the radicals to explain and help you to memorize and practice writing characters.

20. Using apps (as stated in #19) is more helpful than copying characters.

21. Using apps (as stated in #19) helps you learn more than creating stories.

References


