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Abstract
This study employs a qualitative approach which primarily relies on the use of action research to discover how well K.K. and dictionary pronunciation symbols can be used to teach vocabulary in Taiwan’s elementary schools. The six student teachers, two as instructors and four as teaching assistants, were students from the Wenzao Ursuline College of Languages. The study’s subjects were two primary-school classes from schools in southern Taiwan. The research procedure was based on van Lier’s (1994) Cycle of Action Research, a model adapted from Kemmis and McTaggart’s (1982) framework. The participant instructors engaged in three month-long cycles of action research. The findings reveal that student teachers demonstrated a great interest in improving students’ spelling accuracy, although the main goal of the Ministry of Education for elementary English education is to establish basic communication skills (i.e., students’ listening and speaking skills) (Ministry of Education, 2003, 2006). The results also show that when employing phonetic symbols to facilitate vocabulary learning, the instructor using K.K. symbols encountered more pronunciation problems than the instructor who used dictionary symbols. Furthermore, the K.K. symbols instructor encountered the problem of students’ confusing basic phonetic symbols, for instance, misreading [ə] as [e]. After the participant instructors incorporated the inputs from the action research group to tackle these problems, the results indicated an accuracy rate of 80% from the students in the final assessment.

Key Words: vocabulary learning strategies, phonetic symbols, collaboration action research
BACKGROUND

In 1998, amendments made by Taiwan’s Ministry of Education (MOE) pushed ahead the year its public-school students would be exposed to the English language, replacing a model that initiated students in the seventh grade (Butler, 2004). In 2001, the MOE officially unveiled a system-wide program introducing English to children in either the fifth or sixth grade. Its main goal was to provide elementary students with basic communication skills (i.e., listening and speaking) and then to include reading and writing as subsidiary skills (Ministry of Education [MOE], 2003, 2006). As a result of having to teach the reading of vocabulary at this level, most teachers of English in Taiwan have employed the familiar K.K. phonetic symbol system as a pronunciation aid.

Severe problems occurred when these teachers employed K.K. phonetic symbols in elementary classrooms. K.K. phonetic symbols can be difficult to memorize, as they are a large set of symbols different from letters. Moreover, students can confuse K.K. symbols with letters which look the same but have different sounds. These difficulties can cause students’ frustration, thereby lowering the efficacy of K.K. in the teaching of vocabulary.

Recently, some language teaching scholars began to promote dictionary phonetic symbols, the pronunciation key provided in student dictionaries in English-speaking countries. Compared to K.K. phonetic symbols which are closer to International Phonetic Alphabet (IPA) than the dictionary phonetic symbols which originated from Webster’s New World Dictionary, American dictionary phonetic symbols better express the relationship between pronunciation and
words, are less confusing, offer sound-to-alphabet equivalency spelling assistance, and are thereby more suitable for teaching English pronunciation (Fu, 1995; Wang, 1988, 1991). They claim that dictionary phonetic symbols are easy to learn and can be an alternative for teachers of English. However, since Taiwanese instructors are well aware of the differences between western and Eastern learning environments, the suggestion has so far proved unconvincing.

PURPOSE

The main purpose of the study is to investigate whether dictionary phonetics are suitable for beginning English learners in a foreign language context such as Taiwan. The study compared the efficacy of K.K. and dictionary phonetic symbols in teaching vocabulary to beginning English learners in Taiwan. Toward this goal, the research sought to answer two questions:

1. What problems did the instructors encounter during the action research when they taught English vocabulary by employing K.K. and dictionary phonetic symbols?
2. How did the instructors work at solving these problems?
LITERATURE REVIEW

Knowing a Word

When a teacher asks a student if he knows a word, the teacher will be normally satisfied by a student who claims to know the meaning of the word. However, Folse (2004) in his Vocabulary Myths points out that knowing a word involves much more than just knowing its meaning. He indicates that besides the meaning, knowing a word means that one should know its spelling and pronunciation, connotation, part of speech, and usage as well. The rationales for knowing the above-mentioned parts are as follows. For spelling and pronunciation, English is a language that has relatively a low letter-to-sound correlation, thus making many English words difficult to spell and/or pronounce. Without correct spelling and pronunciation, it is easily to misunderstand what a word means. “All words have a denotation, the most basic or specific meaning of word, and connotation, a word change from negative to positive or vice-versa” (Folse, 2004, p.11). Students can use a wrong word if they do not know its connotation. In addition, knowing the part of speech of a word is important. It is especially critical when learners know two or more forms for one word. Knowing a word also means that one needs to know when one can appropriately use that word instead of a synonym—for instance, when to use “kick the bucket” instead of “pass away.”
L1 Chinese ESL/EFL Learners’ Vocabulary Learning Strategies

Since learning vocabulary requires much effort, many strategies have been developed to assist ESL/EFL learners in mastering words. After assessing 707 university students learning EFL, Stoffer (1996) indicated that one vital variable significantly related to vocabulary strategy use is a learner’s previous language learning experience. As Chinese is one of the most-spoken languages in the world, it is important to discuss L1 Chinese learners’ English learning strategies in a separate category.

In Canada, Lessard-Clouston (2008) examined how native English speakers (NES) and non-native English speakers (NNES) approached their technical English vocabulary learning in Theological Language at the Christian graduate school of theology. The participants in this study were five NES and six NNES students, and all the NNES participants were Chinese, with either Cantonese (4, from Hong Kong) or Mandarin (1, from Singapore) as their first language. Data was collected from pre- and post- Tests of Theological Language (TTL), through mid- and end-of-term interviews, and at the end of the course with an Approach to Vocabulary Learning Questionnaire. The questionnaire was based on Sanaoui’s (1995) two distinct approaches to vocabulary acquisition—unstructured and structured strategies for learning vocabulary. These two strategies differ in five key aspects—learners’ opportunities for learning vocabulary; their range of self-initiated vocabulary learning; their records of the lexical items they were learning; how often learners reviewed such words/records; and whether they practice such lexical items. The major finding indicated that participants who approached
their technical vocabulary learning in an unstructured manner tended to obtain higher scores on the TTL.

In a minority area, Guizhou, China, Peng and Srikhao (2009) explored the overall pattern of English vocabulary learning strategies employed by the Miao, one of the largest ethnic groups in China. Thirty Miao students in south-eastern Guizhou province in China were randomly sampled to participate in this study. A questionnaire was given and a semi-structured interview was conducted, which included cognitive, meta-cognitive, social/affective, and translation strategies. One of the main findings indicated that the majority of students tend to use cognitive strategies—guessing, dictionary, note-taking, memory, and activation—for vocabulary learning more than the other three strategies.

In Hong Kong, Lip (2009) investigated the most frequently used and most useful English vocabulary language learning strategies for Cantonese learners. The thirty-six student participants were from postsecondary institutions and were asked to conduct a questionnaire (adapted from Cheung, 2004) on the frequency of their use of vocabulary learning strategies and their perception of the strategies’ usefulness. The results showed that the frequency of vocabulary learning strategies used did have an influence on the post-secondary students’ choices of the most useful vocabulary strategies. It also pointed out that the most frequently used and most useful vocabulary learning strategies were spelling words in the mind repeatedly, analyzing a word by breaking down its sound segments, remembering words by doing a project, and asking classmates for the meaning of a word.
In China, Zhao (2009) explored how meta-cognitive strategy training would facilitate English vocabulary learning in a group of Chinese college students. The subjects consisted of 134 freshmen from two natural classes under the instruction of the same teacher in China. One class of 68 students constituted the experimental group and received both cognitive vocabulary strategy training and meta-cognitive strategy training. The other class of 66 students served as a control group and received only cognitive strategy training. The seven cognitive strategies in the training were consulting a dictionary, repetition, guessing from context, using word cards, association, using a word part strategy, and consolidating a word by applying it to conversation and writing. The meta-cognitive strategy was based on the three components of planning, monitoring and evaluating. Students were required to make an appropriate plan, monitor each other’s learning, and evaluate the learning process by handing out a checklist. The results showed that the meta-cognitive strategy proved most effective.

Four other studies in Taiwan also examined the effects of various English vocabulary learning strategies. M. H. Lin (1999) examined the effects of various English vocabulary learning strategies on Taiwan’s junior-high students. The subjects were from two eighth-grade classes in Kaohsiung, Taiwan. She edited two textbooks—English Vocabulary Strategies I and English Vocabulary Strategies II—to teach these two classes for five weeks, with two periods in each week. The former textbook includes seven bottom-up strategies: (1) word rehearsal, (2) the image-memory method, (3) linking with similar sound from Mandarin or Taiwanese, (4) linking actions with words, (5) breaking words down by prefix, root and suffix, (6)
analyzing words by breaking them down to their syllable segments, and (7) applying phonics. The latter contains six top-down strategies: (1) learning through games, (2) looking up meanings in a dictionary, (3) making up a story, (4) making command sentence, (5) looking up example sentences, and (6) making up phrases and sentences. Although no significant difference were found in the performances of two groups, the study indicated that in the group taught with the bottom-up strategies word rehearsal is most frequently used, followed by breaking down words based on prefix, root and suffix, analyzing the word by breaking down the syllable segments, linking actions with words, and creating mental linkages. Furthermore, most students suggested that teachers should teach more K.K. phonetic symbols and use more games and word examples in class.

Y. Y. Tsai (2010) explored the effects of enhanced writing practice on first graders’ English alphabet achievement and vocabulary recognition. The subjects were 52 first graders at an elementary school in Taipei County. The experimental group received 12 weeks of enhanced writing practice, while the control group did not. English learning achievement tests were conducted to measure the subjects’ English ability before and after the experiment. Data was collected from the students’ pre- and post- English learning achievement tests. Although the experimental group had only showed, through the between-group $t$-test, a statistically significant difference regarding alphabet ordering, the within-group $t$-test analysis showed that the experimental group scored statistically significant results on the post-test for letters recognition, dictation, and vocabulary recognition. The results suggested that enhanced writing practice
significantly increased students’ English alphabet learning achievement and vocabulary recognition.

Lo (2005) investigated the relationship between Taiwanese EFL subjects’ motivation and English vocabulary learning strategies. The data was collected from 291 randomly selected subjects from a junior college through a questionnaire. The results showed that the subjects’ motivation towards learning English was instrumentally motivated, which means that they learned English mostly for personal benefit rather than interest. The study also indicated that these subjects’ most often-used vocabulary learning strategies were memory, cognitive, meta-cognitive, affective and social strategies.

C. C. Tsai and Chang (2009) examined EFL vocabulary learning strategies at the university level. A total of 675 participants took part from Nan Kai University of Technology with English and non-English majors. An EFL vocabulary learning strategy questionnaire was adopted for data collection. Its findings revealed that dictionary-using strategies were used most frequently and vocabulary-perception strategies were used least. Furthermore, the study also showed that the higher-level students, both English and non-English majors, used more vocabulary strategies than intermediate-level students, who in turn used more vocabulary strategies than lower-level students.

In sum, it seems that memory and meta-cognitive strategies are used most by L1 Chinese learners. When Chinese learners learn vocabulary, they tend to use strategies of memory, including word rehearsal, analyzing the word by breaking it down into sound or syllable segments, linking similar sounds from Mandarin and note-taking, breaking down words based on prefix, root and suffix, spelling
the word in the mind repeatedly, and creating mental linkages. In addition, they also use meta-cognitive strategies like making appropriate plans, monitoring each other’s learning, and evaluating the learning process using checklists. Other strategies, such as consulting a dictionary, asking classmates, remembering words by doing a project, guessing and enhanced writing practice, were also found to be useful.

**Employing Phonetic Systems to Teach Vocabulary**

The above studies show that many English vocabulary learning strategies used by L1 Chinese learners are related to what they have heard, i.e., word rehearsal, analyzing the word by breaking it down into sound or syllable segments, and linking similar sounds from Mandarin, to assist English vocabulary learning (M. H. Lin, 1999; Lip, 2009). Similarly, in Taiwan, many scholars and teachers use phonetic symbols as one important tool to help students memorize the sound the vocabulary.

Phonetic symbols are taught as a pure pronunciation aid and rarely for linguistic study in Taiwan (Hsu, 2000; C. C. Lin, 2000). There are at least four kinds of English pronunciation systems used in Taiwan’s schools to assist vocabulary teaching, namely, D.J. phonetic symbols, IPA (International Phonetic Alphabet), phonics, and K.K. phonetic symbols. K.K. phonetics was more wildly accepted than phonics before 1998. Before 1998, it actually dominated the English curricula for junior and senior high schools in Taiwan for decades (Chen, 1998; Hung, 1998).

Recently, some scholars have begun to promote dictionary phonetic symbols, the pronunciation guide provided in the student
dictionaries of English-speaking countries (Fu, 1995; Wang, 1991). They questioned the K.K. method from phonological and student’s perspectives. K.K. is a whole phonetic code in itself, which separates it from traditional English spelling. In other words, as an extant system, K.K. taxes the learner’s memory (Chang, 2003; S. L. Lin, 2003; Wang, 1988, p. 61). Moreover, while K.K. and the American-English alphabet do share some symbols, they do not have corresponding pronunciation, creating confusion and bother for students and thereby greatly decreasing the effectiveness of their language learning (Chang, 2003; Hsu, 2000; Wang, 1988, p. 63). For example, instead of using the K.K. phonetic symbol /si/, using the dictionary phonetic symbol /sē/ to express “see” (Wang, 1991, p. 65) makes it readily pronounceable. This is due to the congruities between the symbols in dictionary phonetics and the letter of the alphabet. And, dictionary phonetics, moreover, due to its similarity with letters, allows students who have mastered the concepts to spell what they hear (Wang, 1991). For instance, instead of using the K.K. phonetic symbol /let/, using the dictionary phonetic symbol /lāt/ to pronounce “late” is purposefully designed to be easy on the memory (Wang, 1991). It can be seen that dictionary phonetic symbols better express the relationship between language and words, are less confusing, and offer more sound-to-alphabet equivalency spelling assistance. Therefore, some suggest that dictionary phonetic symbols are a more suitable phonetic system for teaching English pronunciation (Fu, 1995; Wang, 1991). However, there is little research to corroborate this claim.

From 1998, Taiwan’s Ministry of Education mandated a new policy requiring students to start learning English in third grade and
Phonic instruction became a new trend in aiding Taiwanese children to pronounce English words. However, phonic instruction has gradually been revealed to have some serious problems, one of which is that some children use the Chinese phonetic system to index the sound of English.

Consequently, many researchers in Taiwan started to re-examine whether the K.K. phonetic system could assist elementary students in learning vocabulary more effectively than phonic instruction (Chu, 2006; Lee, 2010; Li, 2010; Liu, 2010). For example, Chu (2006) examined the effect of phonic and K.K. phonetic symbols on word pronunciation in elementary schools. The participants were two classes of 62 sixth graders in Taipei City. Two classes were randomly assigned to an experimental group that received instruction in K.K. phonetic symbols for a semester and a control group receiving the instruction in phonic symbols. The results showed that students receiving K.K. phonetic symbol instruction outperformed those who received phonic instruction on monosyllabic, polysyllabic, regular and irregular word pronunciation. Additionally, it was found that students who received instruction in phonic symbols also made more errors in vowel pronunciation.

Li (2010) also investigated the effects of K.K. phonetic symbols and phonic remedial instruction at a junior high school. Six ninth graders with low English decoding and encoding ability participated in the study. During the three weeks of remedial instruction, all participants took 30-minute K.K. phonetic symbol and phonic remedial instruction sessions five times a week during their noon break. In addition, they reviewed lessons in the office after class. Through tests and interviews, the results showed that K.K. phonetic
symbol and phonic remedial instruction were both helpful in promoting the students’ pronunciation in English. The students improved significantly in K.K. phonetic symbol tests, including English letter writing, reading syllable segmentation and reading phoneme blending in words. However, the students also improved significantly in phonics tests, including listening to word identification, listen-and-write (letter-sound relationships), and reading words (word blending).

The above studies show that when teaching students vocabulary, teachers can use K.K. phonetic symbols to assist their students in pronunciation. For spelling, however, K.K. phonetic symbols may not be useful. Lee (2010) indicated that students between the K.K. and phonics groups showed no significant differences in spelling posttest.

If it is true that K.K. phonetic instruction is unhelpful in teaching spelling, are dictionary phonetic symbols a more effective alternative, as some scholars have suggested? If dictionary phonetic symbols are used in EFL classrooms, what issues may arise? These are the questions that this study explores.

**METHODOLOGY**

The study primarily employed action research to discover the feasibility and adaptability of using K.K. and dictionary pronunciation symbols to teach vocabulary to young English learners. Through the action research process, the study helps to reveal problems and possible solutions when employing the phonetic system to assist vocabulary teaching.
Action research is a systematic method of inquiry that helps teachers to improve their class instruction and professionalism; therefore, it is also commonly called as “teacher research.” Action research at its core is experience-based and oriented by a particular problem posed and the search for solutions (Cohen & Manion, 1985; Corey, 1953; Schecter & Ramirez, 1992; Wallace, 1991). This study, which focuses on the use of phonetic systems as a solution to a pedagogical issue, is especially suited to action research.

Action researchers commonly use collaboration to enhance validity and reliability (Burns, 1999; Cohen & Manion, 1985; Reason, 1994; Schecter & Ramirez, 1992). Collaboration may involve a curriculum project with many schools or a community action program embracing a number of major organizations. These combinations tend to yield more information than purely localized projects (Burns, 1999; Cohen & Manion, 1985). As the main purpose of this study is to explore, collectively, solutions to problems rather than problems, and because the discussions and pooled experience of a group is better for stimulating possible solutions, the use of collaborative action research is especially appropriate.

Participants

The six student teachers who participated in this study were selected from a pool of senior foreign language instruction majors at the Wenzao Ursuline College of Languages on August 22, 2008. They were divided into two instruction groups: One group taught K.K. and the other, dictionary phonetics. Each group had one instructor and two assistants. Dorothy and Jessica taught K.K. and dictionary phonetics, respectively. Jenny and Claire assisted Jessica, and Charlene and
Natalie assisted Dorothy. Prior to their teaching period, they participated in a 4-hour a day workshop (10 a.m. to noon, 1 p.m. to 3 p.m.) from August 25 to 31, 2008. The workshop was conducted by the researcher and focused on the two phonetic systems as well as action research procedure.

Four classes of sixth-grade students, two from Xiliao Elementary School in Kaohsiung County and two from Chung-cheng Elementary School in Kaohsiung City, participated in this study. The two classes from Xiliao, “Obedience” and “Faith,” had 8 and 9 students respectively, and the two from Chung-cheng, “Wind Ensemble Team” and “13,” had 14 and 17. The two participant instructors, Jessica and Dorothy, first went to teach students in Chung-cheng simultaneously in the morning, and then, in the afternoon, they moved to Xiliao.

The students at Chung-cheng had received 45 minutes of English instruction twice a week since their third grade, and their reading material was Kang-Hsuan Publishing’s New Wow English. Comparatively, Xiliao introduced students to English in the first grade using Jainbook’s English Book once a week for 45 minutes. Before the experiment started, the researcher had provided half of the participating students with on 18-hour workshop for learning K.K. and another 18-hour workshop for learning dictionary phonetic symbols.

The researcher was a participant observer. That is, when action research was taught in the workshops, the researcher was the teacher introducing the theory to the group. When the student teachers conducted their three cycles of action research, the researcher was the
observer in the conference room collecting data, as well as a discussion leader during meetings held to facilitate communication.

**Instructional Materials**

Based on the available textbooks, the six participant instructors finished designing lesson outlines for their experimental teaching from August 25 to 31, 2008. Then, they further designed two vocabulary textbooks for use in their teaching. The structure and contents of both textbooks were the same, except for how the pronunciation of vocabulary was presented.

The textbooks covered topics related to the environment, energy, science and technology. Each topic was covered in three to five units. One unit included materials to be taught in one week, and there were a total of 12 units. Each unit consisted of one 50-word science article, ten new English words, listen-and-circle quizzes, scramble words, and matching practices.

**Teaching Process**

The objectives for each class were that students would be able to comprehend the meaning of the article, and correctly articulate the sound and spell out the 10 new words in each unit. For example, the 10 vocabulary words in Unit One were and, ocean, contain, cloud, air, place, creature, same, cave, igloo, and building (see Appendix for the syllabus). The teacher first briefly introduced the contents of the lesson and then led the students in reading the vocabulary and sentences. The teachers of each individual group would then use their respective phonetic symbols, i.e., K.K. and dictionary phonetic symbols, to mark the pronunciation of the words. Then, they would
ask students to use the respective phonetic symbols or rules of phonics to spell the words and do the exercises.

**Procedures**

The experimental teaching lasted one semester, from September 12 to December 12, 2008. Each school had two classes. One class received instruction in K.K. phonetic symbols to learn vocabulary, and the other received instruction in dictionary phonetic symbols. Instruction for each class lasted for 45 minutes. In total, participant instructors provided three hours of instruction every Friday: two 45-minute sessions for Chung-cheng Elementary School from 10:10 to 11:40 a.m. and two for Xiliao from 1:30 to 3:00 p.m.

During the period of experimental teaching, each of the two participant instructors conducted three cycles of action research for each class from the two schools. They and their assistants followed up with a 90-minute action-research discussion session every Friday, usually between 3:30 and 5:00 p.m. They formed a discussion group to make reports and exchange perspectives on the action research’s implementation.

The procedure was based on van Lier’s (1994) Cycle of Action Research. The Cycle, which adapts Kemmis and McTaggart’s (1982) definition into a suite of four steps, planning, acting, observing and reflecting, allows researchers to systematically collect and analyze data for proposing effective solutions. Based on van Lier’s model, participant instructors implemented one step per week and discussed their progress each Friday. During the “reflection” week, participants evaluated the usefulness of their solutions and set up a goal for the next cycle. Under this model, one cycle was completed per month.
DATA COLLECTING AND PROCESSING

Data was collected mainly from the action-research reports and tape transcripts made of the meetings. From September 12 to December 12, 2008, twelve meetings were recorded and transcribed, and twelve action-research reports were collected.

The two instructors conducted three cycles of action research at the two schools, for a total yield of 12 reports. Each participant instructor produced two reports per month; in other words, for every action-research cycle, they wrote one report for each of the two schools. The instructors were Jessica and Dorothy, who taught dictionary and K.K., respectively. Each report was prepared in Chinese but mixed with English, with an average length of five to six single-spaced pages.

The researcher observed responses through the audiotapes, and the 12 transcripts collected from the weekly meetings. The researcher in the role of participant observer spearheaded the forums for discussion. Through the three months of weekly meeting, the researcher held one discussion per week and there were 12 discussion sessions in total. When in a discussion session, the researcher shared her professional experience and facilitated at appropriate times, for instance, by probing a participant instructor for clarification when confusion seemed apparent. Permission from the discussants was obtained prior to recording; the tape-recording procedure was monitored by a research assistant. The assistant also prepared Chinese-language transcripts, each of which had an average length of four to six pages.
Data Analysis

To synthesize the analyses while maintaining their basic integrity, the researcher made use of Erlandson, Harris, Skipper, and Allen’s (1993) and Miles and Huberman’s (1994) techniques for qualitative researchers. More specifically, the analysis procedure included five elements: early steps in analysis, reducing data, displaying data, drawing conclusions, and confirming findings.

The earliest step was the preparation of a preliminary coding scheme to categorize the raw data. This included putting all the instructors’ action research reports together to develop a preliminary coding list based on two of the qualitative research questions. Four strategies were used to reduce data—unitizing data; emergent category designation; bridging, extending and surfacing data; and marginal remarks. For example, to display data, a thematic conceptual matrix was used to indicate the specific problems concerning the instructors’ action research reports. Here the researcher identified two problems in the column heading: spelling difficulty, and pronunciation problem. Then, the cases of the reports were arranged sequentially with two similar possible solutions: using dictionary phonetic symbols and using K.K. phonetic symbols. Finally, similar clustering was carried out using such elements of action research as cycles, instructors, problems, alternatives and effects. The conclusions drawn were based on Miles and Huberman’s (1994) techniques of noting patterns and themes, counting, and making contrasts and comparisons. Finally, to increase the validity of the study, the researcher used four major heuristic methods outlined by Miles and Huberman (1994) to confirm the findings—checking the representativeness of the data, examining researcher effects,
triangulating the methods, strategies and data sources, and putting appropriate additional weight on more reliable data sources.

FINDINGS AND DISCUSSION

1. What problems did the instructors encounter during the action research when they teach English vocabulary by employing K.K. and dictionary phonetic symbols?

Problem and Strategy Analysis

The two participant instructors used dictionary pronunciation keys and K.K. phonetic symbols to teach vocabulary. The problems discovered could be classed into two major categories: spelling difficulties and pronunciation problems. The results show that, while teaching vocabulary to elementary students, teachers of English in Taiwan seems more concerned with spelling and pronunciation than such elements as connotation, part of speech, and usage. Of the 12 action research studies carried out, seven belong to the spelling difficulty category, which is about 58% of the total amount of action research. The pronunciation problem category includes five studies, or 42% of the total amount of action research.

These problems were raised by the participant instructors during the course of their action research. After receiving input from the action research discussion group, the participant instructors attempted to implement different solutions. At the end of each action research, teachers gave students final evaluations, which could be a written or oral test, to see whether the solutions had effectively solved the identified problems. The results of the tests showed that students
in seven of the twelve carried-out action research studies “correctly” answered more than 80% of the evaluation questions. The participant instructors’ problems, solutions, and the efficacy of solutions, including the format for each evaluation and its corresponding correct rate, are summarized in Table 1.

### Table 1
**Action-Research Problems Database of Teaching Vocabulary**

<table>
<thead>
<tr>
<th>Problem Category</th>
<th>Cycle</th>
<th>Participant Instructor</th>
<th>School</th>
<th>Problem</th>
<th>Solution</th>
<th>Efficacy of Solution</th>
</tr>
</thead>
<tbody>
<tr>
<td>Spelling difficulties</td>
<td>I</td>
<td>Dorothy Chung-cheng</td>
<td>K.K.—</td>
<td>Are students able to spell more accurately when they are taught to use K.K. phonetic symbols to memorize vocabulary, or when they are supplied with the standard pronunciation?</td>
<td>Using phonetic symbols; having the participant instructor pronounce vocabulary word; adjusting testing format</td>
<td>Written test: a cloze test with 10 questions, 17 students, 139 answered correctly out of a total of 170 questions Correct rate: 82%</td>
</tr>
<tr>
<td></td>
<td>I</td>
<td>Dorothy Xiliao</td>
<td>K.K.—</td>
<td>Does emphasizing the link between vocabulary and pronunciation keys help students memorize vocabulary more efficiently?</td>
<td>Emphasizing the relationship between phonetic symbols and vocabulary; using flashcards</td>
<td>Written test: a cloze test with 10 questions, 8 student, 58 answered correctly out of a total of 80 questions Correct rate: 73%</td>
</tr>
<tr>
<td></td>
<td>III</td>
<td>Dorothy Chung-cheng</td>
<td>K.K.—</td>
<td>Ways to connect ci, ce, and cy to the sound [s] and increase spelling accuracy</td>
<td>Linking spelling to pronunciation; giving examples</td>
<td>Written test: a multiple-choice test with 5 questions, 15 students, 49 answered correctly out of a total of 75 questions Correct rate: 65%</td>
</tr>
<tr>
<td></td>
<td>I</td>
<td>Jessica Chung-cheng</td>
<td>Dictionary——</td>
<td>Does contrasting sounds with the spelling of words help increase spelling accuracy?</td>
<td>Matching syllables to phonetic symbols</td>
<td>Written test: a test of cloze listening and writing phonetic symbols with 10 questions, 14 students, 121 answered correctly out of a total of 140 questions Correct rate: 86%</td>
</tr>
</tbody>
</table>
### Table 1

**Action-Research Problems Database of Teaching Vocabulary**  
(continued)

<table>
<thead>
<tr>
<th>Problem Category</th>
<th>Cycle</th>
<th>Instructor</th>
<th>School</th>
<th>Problem</th>
<th>Solution</th>
<th>Efficacy of Solution</th>
</tr>
</thead>
</table>
| I                | I     | Jessica    | Xiliao | Dictionary— Does color-coding help students learn vocabulary? | Color-coding method | Written test: a test of cloze listening and writing phonetic symbols with 10 questions, 7 students, 43 answered correctly out of a total of 70 questions  
Correct rate: 61% |
| III               | III   | Jessica    | Xiliao | Dictionary— How to teach students to actively use pronunciation keys to learn spelling? | Comprehensive coverage method, providing phonetic symbols; providing answers for the students to choose from; multiple practice sessions; ample test time | Written test: a test of cloze and writing phonetic symbols with 27 questions, 9 students, 190 answered correctly out of a total of 243 questions  
Correct rate: 78% |
| III               | III   | Jessica    | Chung-cheng | Dictionary— Does the Ghost Writing activity aid students in learning spelling? | Ghost Writing activity practice | Written test: a test of 20 questions for writing phonetic symbols from vocabulary and filling in missing vowels of three vocabulary words, 14 students, 273 answered correctly out of a total of 280 questions  
Correct rate: 98% |
| II               | II    | Dorothy    | Chung-cheng | K.K.— Ways to pronounce ow: [o] and [au] | Relating phonetic symbols with words; image memorization method; raising examples of words that use certain phonetic symbols | Oral test: a test of 10 questions for reading vocabulary from phonetic symbols, 17 students, 159 answered correctly out of a total of 170 questions.  
Correct rate: 94% |
| II               | II    | Dorothy    | Xiliao | K.K.— How to help students distinguish syllables [ə] and [e]? | Image-memory method; associating English sounds with Mandarin. | Oral test: a test of 10 questions for reading syllables, 8 students, 78 answered correctly out of a total of 80  
Correct rate: 98% |
### Spelling Difficulties

Spelling issues is the first category. This refers to the issues instructors encountered when they tried to enhance students’ spelling accuracy through different strategies. In this category, the participant instructors showed more concern about enhancing students’ spelling accuracy than on posing problems. Of the 7 studies, Jessica, the instructor employing dictionary phonetic symbols, carried out four, and Dorothy, the instructor employing K.K. phonetic symbols, did three.
Jessica conducted four action research projects: “Does contrasting sounds with spelling of words help increase spelling accuracy?” in Cycle I at Chung-cheng; “Does color-coding help students learn vocabulary?” in Cycle I at Xiliao; “How to teach students to actively use pronunciation keys to learn spelling?” in Cycle III at Xiliao; and “Does the Ghost writing activity aid students in learning spelling?” in Cycle III at Chung-cheng. Three of them focused on improving spelling through symbols-to-letters association. On the average, the correct rate of her action research was 75%.

Dorothy did three action research projects: “Does emphasizing the link between vocabulary and pronunciation keys help students memorize vocabulary more efficiently?” in Cycle I at Xiliao; “Ways to connect ci, ce, and cy to the sound [s] and increased spelling accuracy” in Cycle III at Chung-cheng; and “Are students able to spell more accurately when they are taught to use K.K. phonetic symbols to memorize vocabulary, or when they are supplied with the standard pronunciation?” in Cycle I at Chung-cheng. Similarly, two of her three studies were attempts to improve spelling through symbols-to-letters association. The correct rate was about 67%.

In short, symbols-to-letters association strategy achieved high correct rates when used for both phonetic systems. As the average correct rates (75% & 67%) were around 70%, it is evident that the strategy worked. This may contradict Lee’s (2010) findings that K.K. phonetic symbols provide no extra help with students’ spelling. Further, when comparing the correct rate between these two phonetic systems (75% vs. 67%), it is fair to say that dictionary phonetic symbols association may have a better effect on spelling than K.K.
Pronunciation Problems

The second category is pronunciation problems. This refers to difficulties students encountered when the teachers used dictionary or K.K. phonetic symbols to vocabulary pronunciation. Out of the 12 action research studies conducted, five belong in this category. Of the five problems encountered, Dorothy posed three and Jessica two. When teaching vocabulary, the teachers who employed K.K. encountered more problems than those who employed dictionary phonetic symbols. In all, although the use of phonetic symbols as a pronunciation aid has been popularly recognized by some teacher researchers (Chu, 2006; Lee, 2010; Li, 2010; M. H. Lin, 1999; Liu, 2010), it seems that pronunciation difficulties still often happen.

The three action research studies that Dorothy posed were “Ways to pronounce ow: [o] and [au]” in Cycle II at Chung-cheng, “How to help students distinguish the syllables [ɔ] and [e]?” in Cycle II at Xiliao, and “How do you correctly pronounce multi-syllable words?” in Cycle III at Xiliao. In contrast, the problems that Jessica encountered were “How do you increase pronunciation accuracy in students?” in Cycle II at Chung-cheng and “How do you aid students in interpreting word pronunciation from phonetic symbols?” in cycle II at Xiliao.

Not surprisingly, the participant instructor who employing K.K. phonetic symbols encountered more problems than the instructor used dictionary phonetic symbols. This result corresponds with Chang (2003), Hsu (2000) and Wang (1988, 1991) who commented that K.K. phonetic symbols could be confused with English alphabets. Although all the students in Dorothy’s class had learned the basics of
K.K. phonetic symbols before this study, some students were still confused about the sounds of the phonetic symbols [ə] and [e].

**Vocabulary Learning Strategies Used**

Among the 12 action research studies conducted, some similar vocabulary learning strategies were adapted by the participant’s instructors to reach goals or solve problems encountered while teaching vocabulary to elementary students. Besides most using the strategy of associating the phonetic symbols with word letters (Chu, 2006; Li, 2010; Liu, 2010), several strategies employed by L1 Chinese students were also found in the study, practicing intensive writing (Y. Y. Tsai, 2010), image-memory (M. H. Lin, 1999) and associating English sounds with Mandarin (M. H. Lin, 1999). Furthermore, the use of some combined strategies was evident. In order to help their students spell and pronounce words accurately, the participant instructors applied some common English teaching strategies. For example, using flashcards, giving word examples and color-coding were found to be very effective.

**A Typical Action Research Project**

2. When using dictionary pronunciation keys and K.K. phonetic symbols to teach vocabulary, how did they solve the problems they encountered?

Below is one typical example from the Spelling Difficulties listed above: *Are students able to spell more accurately when they are taught to use K.K. phonetic symbols to memorize vocabulary, or when they are supplied with the standard pronunciation?*
Dorothy proposed this question for the “spelling difficulties” category during Cycle I at Chung-cheng Elementary School, where she taught K.K. phonetic symbols.

Dorothy administered vocabulary tests during the first week of teaching. Chinese translations and phonetic symbols were provided on the test, but students generally failed to notice the phonetic symbols and went on to spell the words incorrectly. For example, word *igloo* was spelled *ilgoo*.

During the first week of action-research meetings, the group offered two solutions to her problem. One, suggested by Jessica, was to adjust the test format. The other, offered by Charlene, was to provide more lessons in phonetic symbols. She suggested that Dorothy could teach students how to derive vocabulary words from their phonetic counterparts, thus helping students memorize spellings.

Dorothy chose to take Jessica’s suggestion and she adjusted the test format for the second week.

During the second week’s class, Dorothy changed the test format to a “cloze format” and provided the pronunciations of the words to be tested. In the first week, she had given students Chinese translations and asked them to choose the correct answers from a box of vocabulary words. Each test question looked something like this: 1. 陸地 __. For the second week, she changed this to a cloze test: she provided phonetic symbols and asked them to fill in the blanks.

Example:
Week One  
*land, ocean, cloud…*  
1. 陸地 __. (Matching)

Week Two  
[ˈoʃə]  
*o _ _ n* (Filling in the blank).
In addition, she pronounced each vocabulary word out loud for the students.

The results of the tests were good. In the second week, 17 students were present on test day. With ten questions per person for a total of 170 questions, 128 questions were answered correctly, a percentage of 75.2%.

Seven students answered all the questions correctly, two missed one question each, and four students did not pass. Dorothy felt that this was successful and resolved to use the same teaching model next time so that the students’ accuracy rate would continue to improve. Once students knew how to use phonetic symbols to memorize vocabulary words, the stress of memorizing separate vocabulary words would decrease.

During the second week’s meeting, the group listened to her thoughts on the subject and made three comments. Claire pointed out that the first week’s test format was not evaluating students’ spelling ability. The style of the first week’s questions (providing students with English choices and Chinese translations for each separate question) tested only their knowledge of the meaning of the vocabulary words, but not their spelling. Similarly, Natalie said that when English words were provided, the test was not an effective evaluator of students’ spelling ability.

Frances, the supervisor, suggested that Dorothy could repeat the testing model during the third week and incorporate flashcards to deepen the connections between the phonetic symbols and vowels. That way Dorothy could compare the two scores to see if the flashcards truly helped students learn spelling.
After listening to these suggestions, Dorothy decided to adjust the lesson plan for the third week. The goal of her lesson was to leave a deeper impression of the connection between vowels and phonetic symbols. She used flashcards to display phonetic symbols in conjunction with vocabulary words and also used the same structure in her tests to check the students’ comprehension. This time she also prepared “cloze format” tests.

During the third week’s class, she immediately took out the “new” vocabulary flash cards’ to review Unit 2 after she entered the classroom. The flashcards had the vocabulary word and its phonetic symbols on one side and its Chinese translation on the other. When she finished reviewing Unit 2, she immediately gave a review test. The test was a cloze test with phonetic symbols provided, asking the students to spell out the vocabulary words.

On the day of the test, there were 17 students. At 10 questions per student, there were 170 questions in total. The test style was identical to that of the second week: a cloze test. The students answered 139 questions, 81.7% correctly.

In other words, the students showed a marked improvement of 6.5%, in comparison to the 75.2% correct rate of week 2. She felt that using the cloze tests and flashcards increased the students’ ability to memorize vocabulary words and decided to continue using these methods.

During the third week’s meeting, the group listened to Dorothy’s thoughts on the subject and made a further three suggestions. Jenny commented that if the test only provided Chinese translations, then the students would focus on brute memorization. A cloze test that provided vowels would allow for easier memorization.
Charlene said that the cloze test was pretty good for evaluating students’ spelling. However, perhaps the test result had been dependant on the instructor reading the vocabulary words out loud and that the students might not have been able to work from the phonetic symbols alone.

Frances, the supervisor, suggested that the teacher could try not to read out the vocabulary words but instead ask the students to spell them from the phonetic symbols alone. This would test which aspect of the test students relied on more.

After listening to the group, Dorothy decided to adjust her fourth week lesson plan. It would be the same, except that she would not read the vocabulary words out loud, leaving the students to rely solely on the phonetic symbols.

For the fourth week of class, she planned to use the “new vocabulary flashcards” to help students review all the vocabulary words. When she was done reviewing, she would immediately test them using a cloze test with phonetic symbols provided. This time, however, she would not read the words out loud. She would compare the scores from this test with that of the third week to see whether pronunciation aided students in spelling.

During the fourth week of teaching, she followed her lesson plan. After reviewing the vocabulary words with the ‘new vocabulary flashcards,’ she tested the students with the same test style: a cloze test with phonetic symbols provided, but did not read the vocabulary words out loud.

The test results for the fourth week went down compared to week three. There were 16 students. At 10 questions each, that made for a total of 160 questions. The test style was identical to the second
week: a cloze test. The students answered 114 questions correctly for a correct rate of 71%, down 10% from the third week. After seeing this result, Dorothy felt that in the future the instructor should read the vocabulary words out loud, as this appeared to aid the students greatly. She recognized that the drop in performance was due to the fact that she did not read the words out loud.

After the other instructors listened to her thoughts on the subject, they made three comments. First, Jessica commented that if the students relied so completely on the teacher pronouncing the words, then they did not really learn how to convert phonetic symbols into words. Second, Jenny argued that perhaps the students weren’t completely familiar with the phonetic symbols. Third, Frances noted that from these test results, it was evident that students relied heavily on pronunciation when memorizing vocabulary.

Through this cycle of action research, Dorothy discovered that, while teaching students the relationship between vocabulary and phonetic symbols, combining K.K. phonetic symbols and word reading is the most effective way to improve students’ English spelling. In her future lesson plans, she decided that she would incorporate these strategies. From this action research cycle, she learned that cloze tests are one valid way to truly evaluate students’ spelling ability. Furthermore, with the aid of vocabulary flashcards, the beginner students can learn the relationship between vocabulary and phonetic symbols and thus improve their spelling. The most valuable thing that she learned from this action research was that when all of the above are added to the instructor reading out the vocabulary words, EFL beginners are able to spell with even greater
accuracy. She concluded that in tests it would be best if the instructor reads the vocabulary out loud to aid students in spelling.

CONCLUSION

The overall findings of this study contribute to an understanding of the applicability of employing phonetic symbols in vocabulary teaching. Student teachers of English in Taiwan seem more concerned about spelling and pronunciation than connotation, parts of speech, and usage when teaching vocabulary to elementary students. Furthermore, when using the strategy of symbols-to-letters association, both dictionary and K.K. phonetic systems lead to a high correct rate in spelling. This contradicts the opinion that K.K. phonetic symbols provide no extra help with students’ spelling (Lee, 2010), although dictionary phonetic symbols be more effective.

The use of phonetic symbols as a teaching aid in teaching English pronunciation is widespread. However, the most significant finding of this study was that when teaching vocabulary, many problems still occur. The teacher who employed K.K. encountered more pronunciation problems than the teacher employing dictionary phonetic symbols. The problem of confusing K.K. phonetic symbols like [ə] and [ɛ] would show up anytime, even though the students had learned them before.

Finally, besides linking the phonetic symbols and word letters, some EFL vocabulary learning strategies such as multiple practices, intensive writing practice sessions, image-memory, and associating English sounds with Mandarin (Chu, 2006; Li, 2010; M. H. Lin, 1999; Liu, 2010; Y. Y. Tsai, 2010) were also found to be effective by this
study. In addition, the student teachers in the study also borrowed strategies from a teacher’s perspective, for instance, using flashcards, giving word examples, and color-coding to assist student in learning vocabulary.

SUGGESTIONS

The main purpose of the study was to understand the applicability of employing K.K. and dictionary phonetic symbols to teach vocabulary to beginning English learners in Taiwan. The findings could help to Teachers of English in Taiwan and vocabulary learning strategy users. Furthermore, the study also cautions K.K. phonetics users.

Teachers of English in Taiwan

One of the major findings of this study was that teachers of English in Taiwan seem more concerned about spelling and pronunciation than other linguistic aspects. Spelling and pronunciation are the two main categories that the participant instructors focused on when teaching vocabulary. This finding could work as a reminder to many Teachers of English in Taiwan’s elementary schools. That is, besides these two aspects, other things such as parts of speech, connotation and usage are also critical in vocabulary learning. In particular, knowing parts of speech is required to establish basic communication skills (i.e., listening and speaking) as the MOE guideline suggests. If students not only know the meaning, spelling, and pronunciation, but also know the forms for one word, they can more easily master a word. By teaching students the
correct forms of words, mistakes such as “rain day” or “afternoon eat cake” can be reduced. Concerning extending the domains of the vocabulary teaching, it is recommended that the part of speech be added to the lesson plans. For example, besides the meaning in Chinese and spelling, the form of a word should also be introduced. Doing so will facilitate teachers to teach and students to use the word effectively.

**Vocabulary Learning Strategy Users**

The results of this study also demonstrate that by using the strategy of symbols-to-letters association, the correct rates in spelling are high when using both dictionary and K.K. phonetic systems. Furthermore, between these two phonetic systems, the dictionary phonetic symbols association may have a better effect on spelling. This finding will benefit vocabulary learning strategy users no matter whether they are teachers or students. In the past, phonetic symbols were taught purely as a pronunciation aid in Taiwan (Hsu, 2000; C. C. Lin, 2000), and strategies such as analyzing the word by breaking down the syllable segments were popularly used when learning vocabulary. This study shows that learning phonetic symbols can provide an additional benefit to both dictionary and K.K. phonetic symbols users, as long as they associate the symbols with the letters. By contrasting or associating symbols with the letters of a word, they will improve their spelling and pronunciation. When users consider whether to choose K.K. or dictionary phonetic symbols, they will be informed by this study that dictionary phonetic symbols could have a better effect on spelling.
A Cautioning Note for K.K. Phonetics Users

Finally, this study found that, the EFL/ESL student teachers who employed K.K. to teach vocabulary encountered more problems than those who employed dictionary phonetic symbols in the category of pronunciation problems. The three action research studies that the K.K. teacher posed were “Ways to pronounce ow: [ɔ] and [au],” “How do you correctly pronounce multi-syllable words?” and “How do you help students distinguish syllables [ə] and [e]?.” In contrast, the two problems that the dictionary phonetic symbol teacher encountered were “How do you increase pronunciation accuracy?” and “How to aid students in interpreting word pronunciation from phonetic symbols?” The results show that the problems that K.K. teachers encountered seem more complicated than the problems faced by the dictionary teachers.

This finding may raise K.K. phonetic users’ awareness of the complexity of the phonetic system. Both teachers and students should be aware of it. When teachers use K.K. phonetic symbols in elementary classrooms to help student pronunciation, they should be aware that confusing the symbols themselves, such as [ə] and [e], may occur. When learners choose to use K.K. phonetic symbols as a pronunciation aid, they should be aware that some K.K. symbols share their form or share with letters in the American-English alphabet but not the corresponding pronunciation. However, when phonetic symbol and symbol confusions do arise, it may be useful to refer to the strategies that the participant instructor Dorothy carried out. For example, symbol rehearsal, image memorization method, and associating English sounds with Mandarin are very useful when trying to firmly memorize phonetic symbols. Other vocabulary
learning strategies used in this study, such as coloring coding and intense practice writing, are also worth trying.

**Future Study**

Future research on this topic may require more investigation into similar age groups. The researcher suggests that this study be replicated in the future with other variables, like students with different ages, data collection with teaching journals, and certified elementary teachers as participant instructors. The results under these conditions may be different from those found by this study.

**REFERENCES**


Liu, C. J. (2010). *Comparison of the effects between phonics instruction and phonetic instruction to the fifth graders on the


ABOUT THE AUTHOR

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## APPENDIX

### Syllabus

<table>
<thead>
<tr>
<th>Week 1: Environment</th>
<th>Week 2: Animals</th>
<th>Week 3: How Do Plants Come from? (Where do the plants come from?)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Unit 1</td>
<td>Unit 2</td>
<td>Unit 3</td>
</tr>
<tr>
<td>vocabulary: land, ocean, contain, cloud, air, place, creature, same, cave, igloo, building</td>
<td>vocabulary: child, animal, nest, branch, owl, human being, tree trunk, turtle, home, ground</td>
<td>vocabulary: type, grass, fern, bush, flower, growth, food, seed, pollen, circle, colorful, fragrance</td>
</tr>
<tr>
<td>Week 4: Four Seasons with Four Feelings</td>
<td>Week 5: Disasters</td>
<td>Week 6: How Many Planets Are There in our Solar System?</td>
</tr>
<tr>
<td>Unit 4</td>
<td>Unit 5</td>
<td>Unit 6</td>
</tr>
<tr>
<td>vocabulary: season, spring, summer, fall, winter, stuffy, daytime, nighttime, cold, snow</td>
<td>vocabulary: planet, rock, Earth, earthquake, surface, scientist, waste gas, pollution, greenhouse effect, factory, weather</td>
<td>vocabulary: solar system, Mercury, Venus, Earth, Mars, Jupiter, Saturn, Uranus, Neptune, Pluto</td>
</tr>
<tr>
<td>Week 7: Energy Resources</td>
<td>Week 8: The Sun</td>
<td>Week 9: Light</td>
</tr>
<tr>
<td>Unit 7</td>
<td>Unit 9</td>
<td>Unit 10</td>
</tr>
<tr>
<td>vocabulary: convenient, dead, power plant, electricity, provide, town, city, enjoy, comfortable, house</td>
<td>vocabulary: space, world, huge, energy, sink, darkness, sunrise, beach, sunlight, spot</td>
<td>vocabulary: sound, shake, bottle, hear, different, sand, hit, glass, chopsticks, cello, whistle</td>
</tr>
<tr>
<td>Week 10: Sounds</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Teaching Vocabulary through K.K. Phonetic Symbols and Dictionary Phonetic Symbols

After the class, students are able to comprehend the meaning of the science article, and articulate the sounds and spell out the 10 vocabulary words in each unit.
<table>
<thead>
<tr>
<th>Week 11</th>
<th>Unit 11: Magical Magnets</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>vocabulary: magnet, metal, magical, paper clip, power, blackboard, attract, opposite, refrigerator, repulse, North Pole, South Pole, material, plastic</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Week 12</th>
<th>Unit 12: Computers</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>vocabulary: computer, widespread, equipment, keyboard, desktop, laptop, mouse, online, game, internet, email</td>
</tr>
</tbody>
</table>
運用 KK 音標及字典音標教臺灣學童英文字彙：以協同性行動研究為例

摘要

關鍵詞：字彙學習策略 音標 協同式行動研究