Introduction

Converging evidence suggests that letter-sound knowledge (aka. phonics knowledge) is the basis for English literacy development (e.g. Adams, 1990; Dehaene, 2009; Ehri, 1995; Frith, 1985; Lems, Millers, & Soro, 2010; Seymour, Aro, & Erskine, 2003). Good letter-sound knowledge boosts children's confidence and interest in (1) learning the meanings of *regularly-spelt but unfamiliar or unknown* words which they can sound out, and (2) reading. As children's reading experience increases, the dependence on letter-sound knowledge to access meaning is gradually replaced by parallel processing of the sight of a word, letter-sound knowledge, and sentence context (Dehaene, 2009). In contrast, poor letter-sound knowledge not only demoralises and deprives children of the joy of reading but impedes reading development (e.g. Chang, 2003; Cunningham, 2008; Fletcher, 2006; 林彥良, 2009). Recognising the importance and the complexity[1] of letter-sound knowledge, education authorities in the US, UK, and Taiwan mandate that such knowledge be taught through high-quality phonics instruction in primary education. To date, no official statistics on efficacy of phonics instruction has been published. This is perhaps because until high-quality phonics instruction is actually implemented at every school, any efficacy study conducted would be highly premature. The imminent question thus is: what is high-quality phonics instruction?

Earlier studies tended to take teachers' disciplinary knowledge (i.e. a degree in an English relevant field) and certification as the essentials for high-quality phonics instruction (e.g. Bader, 1975). More recent studies, instead, focus on a specific knowledge base. Linguistic knowledge (e.g. phonology, morphology, and syntax) is important, but such knowledge is only one aspect of the knowledge base needed for high-quality phonics instruction (Lane et al., 2009). The defining characteristics of

[1]Seymour, Aro, & Erskine (2003) measured error rates in reading 3 familiar words in 15 European countries after one year of schooling. The English children had the poorest performance with an error rate of 67%.

high-quality phonics instruction features ‘explicit’ and ‘systematic’ teaching of letter-sound rules (Justice, Chow, Capellini, Flanigan, & Colton, 2003). ‘Explicitness’ refers to teachers’ use of clear terminology that focuses children’s attention on the concepts being learnt, whereas ‘systematicity’ refers to the teachers’ organisation and sequencing of lessons so that they reveal the logic of the alphabetic system. High-quality phonics instruction is teacher-directed, and good letter-sound knowledge has been suggested to be essential for teachers to deliver explicit and systematic phonics instruction (Adams, 1990; Ehri, 1995; Share & Stanovich, 1995). A recent study by McCutchen, Green, Abbott, & Sanders (2009) showed that teachers’ performance on the Informal Survey of Linguistic Knowledge[2] (Moats, 1994) correlated with their pupils’ scores on Woodcock Reading Mastery Test-Revised Word Identification/Reading subtest (WRMT-R; Woodcock, 1987, 1998). This correlation, while reconfirming the essential role of teachers’ letter-sound knowledge to deliver high-quality phonics instruction, at the same time raises concerns, as a number of studies concluded that college students, novice and veteran literacy teachers, and even speech-and-language pathologists, are unskilled at relating sounds to letters (e.g. Connelly, 2002; Ehri & Soffer, 1999; Moats, 1994; Stainthorp, 1999). This phenomenon may be explained by the phase theory (Ehri, 1995). As one’s literacy experiences accumulate, letter-sound knowledge is no longer necessary for retrieving pronunciations and meanings of frequently encountered words. Instead, a glimpse is all it takes to instantaneously and simultaneously trigger the pronunciation and meaning of such words. At this stage, letter-sound knowledge is primarily required for learning new words or making lexical decisions.

[2]The Informal Survey of Linguistic Knowledge developed by Moats (1994) assesses teachers’ ability to relate letters to sounds in words. Questions and correct answers include, for examples: (1) Q: How many sounds are in the word *ox*? A: Three [ɔks]. (2) Q: Circle the third speech sound in the word *prayer*? A: *ay* [e].

To tackle the impasse, on the job training to help teachers regain letter-sound knowledge has recently been provided (Connelly, 2002). This however might simply be the first step. High-quality phonics instruction features 'explicit' and 'systematic' delivery. In a recent study, Justice, Mashburn, Hamre, and Pianta (2008) examined 135 teachers who had an average of 15 years of experience teaching literacy and held a Bachelors' degree. Justice et al. reported two important findings. First, 60 out of the 135 received ratings of 1 or 2 on the Literacy Focus scale (developed by Pianta, La Paro, & Hamre, 2004) and only 5 received a high rating. The low ratings relating to the 'explicit indicator' showed that teachers rarely used terms and strategies that make the relationship between letter and sound clear, and the low ratings relating to the 'systematic indicator' showed that the teaching activities were not sufficiently planned to engage children in letters, words, or phonemes. There was also no correlation between 'years of teaching' and 'quality of instructional practice'.

With evidence showing that even veteran native English literacy teachers need to improve letter-sound knowledge, and that many are unable to deliver high-quality phonics instruction, the pertinent questions to Taiwanese EFL education are: (1) What is the level of Taiwanese EFL teachers' letter-sound knowledge? (2) Can they deliver high-quality phonics instruction? To date no local research has investigated the two questions. As phonics instruction is not limited to primary school EFL education in Taiwan, the above two questions thus concern EFL teachers involved in teaching children, including certified school teachers, substitute teachers, cram school teachers, and private tutors. The current study was conducted to answer the above questions by examining word reading and phonics teaching demonstrations by fourteen Taiwanese EFL teachers working with children at different teaching establishments.

Method

Participants

The participants were 14 Taiwanese EFL teachers. They each held a Bachelor's degree in English-related studies, were studying towards an MA in TEFL, and had taught or were still teaching children English at various teaching establishments. See Appendix 2 for participants' teaching experience and establishments. As phonics instruction is not taught exclusively in primary schools in Taiwan, the current sample though small forms a meaningful group.

The participants had all taught phonics as part of a general 4-skill course; however, they confessed that it was done very briefly (i.e. starting with introducing the 26 letters in the upper and lower case and ending with a letter-sound chant). While acknowledging the importance of phonics instruction, they confessed that they were unsure how to best approach it so that children would learn and not get confused or bored by it.

Design, Procedure, and Results of the Word Reading Test

There are two ways to sound out a regularly-spelt[3] word correctly, by the mere sight of the word and by letter-sound conversion (Dehaene, 2009). The former operates when the given word is so well-learnt that a mere glimpse of it is sufficient for the reader to instantaneously and simultaneously retrieve its pronunciation and meaning. The latter operates when the given word has not yet reached the state where a mere glimpse of it is enough to result in instantaneous and simultaneous retrieval of its pronunciation and meaning. To sound out the word correctly, the reader must, and can only, rely on letter-sound knowledge to divide the word into single letters and/or letter groups, convert them to

[3]In terms of orthography, English words can be divided into two main types: regularly-spelt words and sight words. A *regularly-spelt* English word is one that can be sounded out correctly with good letter-sound knowledge. 'Cat', 'Lake', 'Eight', and 'Sextant' are examples of regularly-spelt words. *Sight* words, on the contrary, are those that can only be sounded out correctly if the reader has learnt their meanings and the pronunciations through rote memory. 'One', 'Eye', 'Colonel', and 'Yacht' are examples of sight words.

corresponding sounds, and string the sounds together to read as one word. Simply put, letter-sound knowledge is the only way to correct sounding of regularly-spelt but unfamiliar or unknown words. As already discussed in the Introduction, letter-sound knowledge is essential for teachers to deliver systematic and explicit phonics instruction. It is therefore paramount to understand Taiwanese EFL teachers' letter-sound knowledge, in particular those working with children. For this reason, the participants were required to complete a word reading test. However, a standardised word reading test is currently unavailable. There are two known tests: the Informal Survey of Linguistic Knowledge (Moats, 1994) and the Graphophonemic Awareness Test (Scarborough, Ehri, Olson, & Fowler, 1998). The Moats' Survey consists of 15 questions, six of which actually examine one's knowledge on morphology (e.g. *find an inflected verb from the following words*), phonology (e.g. *what are six common syllable types in English?*), and morphophonemic knowledge (e.g. *when adding a suffix to a word ending with "y", what is the rule?*). These questions are important, but they are not relevant to letter-sound knowledge. Letter-sound rules included in Moats' Survey are not very comprehensive. The GPA consists of 19 word items and focuses solely on letter-sound knowledge. However, in the same way as the Moats' Survey, letter-sound rules included are not very comprehensive. For the above reasons, a word reading test for the current study was designed.

The purpose of the current test was to measure the participants' letter-sound knowledge, and for this purpose only *regularly-spelt low-frequency* words, incorporating 96 common and non-repeating letter-sound rules, were used as test items. This method was chosen as *low-frequency* words were less likely to be well-learnt words, thus requiring the participants to rely on letter-sound knowledge. Sixty *regularly-spelt low-frequency* words from SUBTLEXus with a frequency value between 0 and 1727.04 per 1,000,000 words were included in the test. See Appendix 1 for the complete word list and frequency values. The participant was

given 5 seconds to read each word. They were tested individually in the author's office, where noise interference was kept to a minimum. DMDX was used to record participants' oral responses. During the test, the author manually sorted the responses into 6 types: (1) instantaneously and correctly (e.g. "tort" for *tort*), (2) false starts (e.g. "errrm…tort" for *tort*) (3) hesitant answers (e.g. "t…ort" for *tort*), (4) repairs (e.g. "sand, oh-no, sorry, sanded" for *sanded*), (5) sound substitution (e.g. "[naʊ]" for *gnaw*), and (6) sound deletion (e.g. "[vɛ]" for *vex*). Response types 1 to 4 were counted as a correct answer. Response types 5 and 6 were counted as an error. This classification ensured that errors reflected participants' gaps in letter-sound knowledge.

There were two important findings. First, the average number of errors per participant was 13.93 letter-sound rules (*SD* = 4.60), indicating that all of the participants had gaps in letter-sound knowledge. See Appendix 2 for participant performance on the word reading test. Second, letter-sound knowledge did not correlate with years of teaching experience (Pearson's $r = -.45$, $p = .12$, two-tailed), indicating that letter-sound knowledge does not come naturally with teaching experience. As already reviewed in the Introduction, good letter-sound knowledge is essential for teachers to deliver high-quality phonics instruction. The current findings, therefore, have an important implication: letter-sound knowledge training is needed for Taiwanese EFL teachers working with children. While the current sample was small, it encompassed novice and veteran teachers working with children at various teaching establishments. The findings could therefore reasonably be commonplace among Taiwanese EFL teachers working with children.

Although good letter-sound knowledge is essential for teachers to deliver high-quality phonics instruction, this knowledge alone may not be the guarantee for high-quality phonics instruction. To explore whether Taiwanese EFL teachers with improved letter-sound knowledge can deliver high-quality phonics instruction, the

same 14 participants were individually given feedback on their word reading test, shown their errors, and taught the letter-sound rules. Six 3-hour group meetings with the participants followed to make them aware of research findings showing a positive correlation between teachers' letter-sound knowledge and pupils' performance, the importance of letter-sound knowledge and phonics instruction in English literacy development, the individual role phonology, orthography, and morphology plays as well as their interdependence in English literacy development.

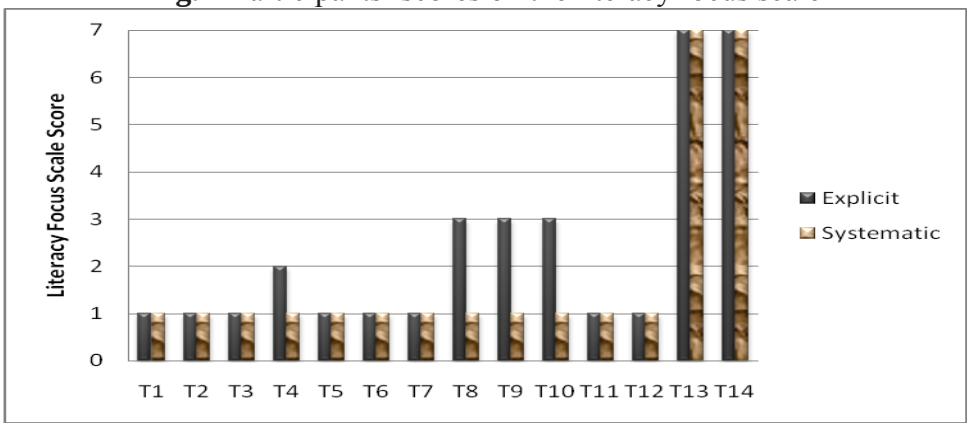
Phonics Teaching Demonstrations

Utilising their improved letter-sound knowledge and reinforced understanding of the importance of phonics instruction in pupils' literacy development, can the participants deliver high-quality phonics instruction? To find out, the participants were given two weeks to prepare a 15-minute child-friendly phonics lesson, teaching 5 basic letter-sound rules: a - [æ], e - [ɛ], i - [ɪ], o - [ɔ], and u - [ʌ]. They were permitted to converse with the other participants and come up with what they thought would be effective phonics teaching.

Participants' phonics teaching demonstrations were evaluated using the Literacy Focus scale. Indicator descriptions of low (1-2), mid (3-4), and high-quality (6-7) literacy focus are shown in Appendix 3. Fig. 1 depicts participants' scores along the 1-7 rating scale. The average ratings for the 'explicitness indicator' was 2.36 (*SD* = 2.13), for the 'systematicity indicator' 1.86 (*SD* = 2.18), and for the Literacy Focus scale 2.11 (*SD* = 2.11). Nine out of 14 lessons (64%) received ratings of 1 or 2 on the 'explicitness indicator,' 12 out of 14 lessons (86%) received ratings of 1 or 2 on the 'systematicity indicator,' and 12 out of 14 lessons (86%) received ratings of 1 or 2 on the Literacy Focus scale. Based on the results of the 14 teaching demonstrations, instruction was characteristically of low quality and, importantly, years of teaching experience did not correlate with teaching performance (Pearson's $r = 0.52$, $p = .06$, two-tailed), indicating that years of teaching experience does not guarantee high-quality phonics instruction.

Observation notes on participants' teaching demonstrations and scope for improvement are presented below.

Fig. 1 Participants' scores on the literacy focus scale



Observation notes on Teacher 1

Props. The teacher used two sets of five flashcards. In one set the five flashcards each contained one target letter printed in lower case. The other set contained five word-picture flashcards, each with a word printed in lower case on one side, and its corresponding meaning on the other. The words each contained one target letter-sound rule, and the target letter was highlighted in a different colour.

Procedure. The teacher commenced by announcing to the class that they were going to be taught "five vowels *a* [e], *e* [i], *i* [aɪ], *o* [o], and *u* [ju] [*sic*]". The class were showed a flashcard with target letter *a*. The flashcard was held up, and the teacher modelled, "*a* [e] - [æ]" requesting the class to repeat the sounds. Following this, a word-picture flashcard was presented with the word *can* printed in lower case on one side, and a picture of a can on the other. The flashcard was held up, and the teacher modelled, "*can* [kæn]" requesting the class to repeat the sounds. Then the teacher elicited, "What is a *can*?" The flashcard was flipped over to reveal a picture of a can. The same procedure was repeated for teaching the remaining four target letter-sound rules. After this, the class was taken through the five letter-sound

rules, the words, and the pictures. Finally, the five word-picture flashcards were placed on the blackboard with the word side up and a volunteer was invited onstage. The volunteer was required to provide word translation and whole-word pronunciation for any of the five words the teacher pointed to.

Scope for improvement for Teacher 1

There were two issues relating to explicitness. First, the teacher's referring to the five letters as five vowels was inaccurate. The teacher had made a common mistake by equating the 'concept of print' to the 'concept of sound'. *Aa*, *Ee*, *Ii*, *Oo*, *Uu* are 'letters used for writing', not 'vowels used for sounding'. Perhaps, the reason why many teachers mistake these five letters as vowels is that in most printed words at least one of the five letters is present, and in many cases the five letters do map onto vowel sounds. The following two examples, however, should clearly explain why it is fallacious to equate a 'printed letter' to a 'sound concept'. Taking the printed *u* in the printed word *university* as an example, if the printed *u* were a vowel, then the indefinite article for the printed word *university* would be *an*, making the noun phrase **an university*. However, the correct indefinite article for *university* is *a*. This demonstrates that introducing an equation between the printed *u* and a vowel is erroneous. Now, let's take the printed letter *F* in the acronym *FBI* as another example, if the printed *F* were a consonant, then the indefinite article for the printed noun phrase *FBI agent* would be *a*, making the noun phrase **a FBI agent*. However, the correct indefinite article for *FBI agent* is *an*. This demonstrates that introducing an equation between the printed *F* and a consonant is erroneous. From the examples, we can see that the convenience of equating the 'concept of letter' to the 'concept of sound' can cause confusion when pupils start to learn to make noun phrases.

The other, but more serious, issue was that without making any attempt to explain when the letter *a* [e] should be pronounced [æ], the teacher simply asked the class to repeat the sound. Without an explanation it is probable the pupils will continue to pronounce the letters by their 'letter names' even in times when 'letter sounds' should be used. Without the explanation, it is doubtful that pupils will have the ability to figure out letter-sound rules themselves from new words containing the rules, especially when the teacher places the focus on word meaning and whole-word pronunciation rather than on how to convert letters to sounds and assemble sound segments to make up the whole-word pronunciation. The purpose of phonics instruction is, and should be, to teach letter-sound knowledge 'explicitly' so that pupils can sound out words correctly by converting letters to sounds. Teacher 1 unfortunately missed this point, and therefore the lesson was assigned an 'explicitness indicator' rating of 1.

The above problems also make it impossible for pupils to address the demands of the exercise (i.e. provide word translation and whole-word pronunciation). Even as part of a well-planned lesson, the exercise would still be too advanced for beginner pupils. An introduction to such an exercise would have been more effective if it had been preceded by one that required the pupils to provide letter sounds for corresponding letters, to explain when letter sounds are used, or to match printed words to whole-word pronunciations. For these reasons, the lesson was also assigned a 'systematicity indicator' rating of 1.

Observation notes on Teacher 2

Props. The teacher also used two sets of flashcards, and the cards were in the same style as those of Teacher 1.

Procedure. Teacher 2's lesson was highly similar to that of Teacher 1. The only difference was with the exercise delivery. Teacher 2 placed the five word-picture flashcards on the blackboard with the picture side up, and invited a

volunteer onstage. The volunteer was required to point to the corresponding picture dictated by the teacher.

Scope for improvement for Teacher 2

Teacher 2's lesson had identical issues relating to explicitness as that of Teacher 1, and therefore the lesson was assigned an 'explicitness indicator' rating of 1. The exercise (i.e. match whole-word pronunciations to pictures/meanings) does not require letter-sound knowledge to process. Rather, it requires spoken vocabulary knowledge. For this reason, the lesson was also assigned a 'systematicity indicator' rating of 1.

Observation notes on Teacher 3

Props. The teacher also used two sets of flashcards, and the cards were in the same style as those of Teacher 1.

Procedure. The teacher commenced by presenting a flashcard to the class with the word *bat* printed in lower case on one side, and a picture of a bat on the other. The flashcard was held up, showing the word. The teacher elicited, "What is this? It is a bat. *Bat* [bæt]", and asked the class to repeat the sound. Then the flashcard was flipped over, revealing the picture of the bat, and followed up with another prompt question and answer, "What can a *bat* do? A *bat* can fly." The same procedure was repeated for teaching the remaining four target letter-sound rules. Finally, a letter flashcard was presented with the letter *a*, modelled, "*a* [e] - [æ]," and the class repeated the sound.

Scope for improvement for Teacher 3

Teacher 3 also did not make any attempt to explain when 'letter sounds' should be used and focused on teaching word meaning and whole-word pronunciation rather than on how to convert letters to sounds and assemble sound segments to make up the whole-word pronunciation. Therefore, the lesson was also

assigned an ‘explicitness indicator’ rating of 1. Teacher 3 did not plan any exercises to reinforce learning. For this reason, the lesson was also assigned a ‘systematicity indicator’ rating of 1.

Observation notes on Teacher 4

Props. The teacher used three sets of five flashcards. Each flashcard in the first set contained one target letter printed in both upper and lower case. The second set also contained five flashcards, but each with a target letter-sound rule (e.g. *a* - [æ]). The third set contained five word-picture flashcards each with one word printed in lower case on one side, and its corresponding meaning on the other. The words each contained one target letter-sound rule, and the target letter was highlighted in a different colour.

Procedure. The teacher commenced by directing the class’ attention to the letter flashcards on the blackboard. The class were taken through the letter names, and then a volunteer was invited onstage to point to the corresponding letter dictated by the teacher. Then, the class was informed that they were going to be taught “the sounds of these letters [*sic*]”. A letter-sound flashcard was presented with *a* - [æ]. This was modelled, “*a* [e] - [æ],” and the class was asked to repeat the sound. Following this, a *fan* word-picture flashcard was presented with the word printed in lower case on one side, and a picture of a fan on the other. The flashcard was held up, and the teacher announced, “*fan* [fæn],” asking the class to repeat the sound. The teacher then elicited, “What is a fan?” The flashcard was flipped over to reveal a picture of a fan. The same procedure was repeated for teaching the remaining four target letter-sound rules. After this, the class was taken through the five letter-sound rules and the words. Finally, the five word-picture flashcards were placed, with the word side up, on the blackboard and a volunteer invited onstage. The volunteer was required to point to a word containing the target letter-sound dictated by the teacher. For example, the teacher says, “[ɔ]”, and the volunteer points to the word *box* placed alongside *cat*, *egg*, *fish*, and *sun*.

Scope for improvement for Teacher 4

Teacher 4 correctly referred to [æ], [ɛ], [ɪ], [ɔ], [ʌ] as 'sounds'. Unfortunately, the teacher did not follow up with an explanation for when 'letter sounds' should be used, and shifted to concentrate on teaching word meaning and whole-word pronunciation. Therefore, the lesson was assigned an 'explicitness indicator' rating of 2.

The above problems also make it impossible for pupils to address the demands of the exercise (i.e. identify a letter sound embedded in a printed word juxtaposed with four other words). Even as part of a well-planned lesson, the exercise would still be too advanced for beginner pupils. An introduction to such an exercise would have been more effective if it had been preceded by one that required the pupils to provide letter sounds for corresponding letters, to explain when letter sounds are used, or to identify letter sounds in a word. For these reasons, the lesson was also assigned a 'systematicity indicator' rating of 1.

Observation notes on Teachers 5, 6, and 7

Teachers 5, 6, and 7 had very similar styles, and therefore their teaching demonstrations and scope for improvement are jointly discussed.

Props. The teachers used two sets of flashcards and a 1-page worksheet. One set contained five flashcards each with one target letter printed in both upper and lower case (e.g. *Aa*). The other set contained five word-picture flashcards, but each with a word printed in lower case on one side, and its corresponding meaning on the other. The words each contained one target letter-sound rule, and the target letter was highlighted in a different colour. The worksheet contained five short song lyrics with gaps for filling letters. Sample lyrics are as follows: 'Listen to the short *a* sound, *a*-*a*-*a*-*a*-*a*. The *a* in *rat* makes the short *a* sound, *a*-*a*-*a*-*a*-*a*.'

Procedure. The teachers commenced by directing the class' attention to five flashcards on the blackboard, each with the letter printed in both upper and lower case (e.g. *Aa*). They pointed to the capital letters and modelled the corresponding letter names, and then pointed to the lowercase letters and modelled corresponding letter sounds. For example, the teachers pointed to *A* and said [e], then pointed to *a* and said [æ]. Following this, they presented a word-picture flashcard with the word *rat* printed in lower case on one side, and a picture of a rat on the other. Holding up the flashcard, they modelled, "*rat* [ræt]," and asked the class to repeat after them. Then they asked the class, "What is a rat?" They flipped over the flashcard and showed the class a picture of a rat. The same procedure was repeated for teaching the remaining four target letter-sound rules. After this, they took the class through the five letter-sound rules, the words, and the pictures. Finally, they gave the class a worksheet containing five short song lyrics, sang the songs one after another by themselves, and asked the class to fill in the missing letters.

Scope for improvement for Teachers 5, 6, and 7

These teachers made an attempt to differentiate between letter names and letter sounds. Unfortunately, they erroneously suggested associating uppercase letters with letter names and lowercase letters with letter sounds. The teachers also concentrated on teaching word meaning and whole-word pronunciation. Therefore, the lesson was assigned an 'explicitness indicator' rating of 1.

The above problems also make it impossible for pupils to address the demands of the exercise (i.e. listen to the lyrics and fill in the missing letters). Even as part of a well-planned lesson, the exercise would still be too advanced for beginner pupils. To complete the exercise, letter-sound knowledge and spoken and written vocabulary are required. Such an exercise is better deferred to a much later stage when the pupils have the ability to provide letter sounds for corresponding letters, explain when letter sounds are used, identify letter sounds in a word, read words

aloud, and have some spoken and written vocabulary. For these reasons, the lesson was assigned a 'systematicity indicator' rating of 1.

Observation notes on Teachers 8, 9, and 10

Teachers 8, 9, and 10 had very similar styles and therefore their teaching demonstrations and scope for improvement are jointly discussed.

Props. The teachers used two sets of five flashcards. In one set, flashcards contained one target letter printed in lower case. The other set also contained five word flashcards, but each with a word printed in lower case. The words each contained one target letter-sound rule. The two sets of flashcards were placed on the blackboard. A word flashcard was juxtaposed with a letter flashcard. For example, the letter flashcard with *a* on it was juxtaposed with the word flashcard with *tap* on it.

Procedure. The teachers commenced by informing the class that they were going to teach the "different names of *a, e, i, o* and *u* [*sic*]." They directed the class' attention to two sets of flashcards on the blackboard. They pointed to the letter flashcard containing *a* and said, "*a* [e] has a different name when it is in a word. Then, they pointed to the word flashcard containing *tap* and said, "repeat after me, *a* [e] - [æ] - *tap* [tæp]." The same procedure was repeated for teaching the remaining four target letter-sound rules. After this, the class was taken through the five letter-sound rules and the words. Finally, they wrote a word with one missing letter (e.g. *t_p*) on the blackboard and invited a volunteer onstage. The volunteer was to listen to the word dictated by the teachers (e.g. [tæp]) and fill in the missing letter.

Scope for improvement for Teachers 8, 9, and 10

The teachers highlighted [æ], [ɛ], [ɪ], [ɔ], [ʌ] as the 'different names' of *a, e, i, o, u*, and explained when the 'different names' would be used. Unfortunately, the grade was reduced when the teachers tried to teach, for example, the *a* - [æ] rule in

a word context. They should have been directed from the letter *a* flashcard to the letter *a* in the word flashcard *tap* with a verbal statement like 'letter *a* in a word has a different name [æ]. Then, utilising the same logic, the class should be guided to convert the letters to their corresponding sounds (*t* to [t], *a* to [æ], and *p* [p]), and finally to string the sounds together and read it aloud as one word). Rather than this, the teachers simply modelled, "*a* [e] - [æ] - [tæp]" and then moved on to teaching word meaning and whole-word pronunciation. For this reason, their lessons were only assigned an 'explicitness indicator' rating of 3.

The above problems also make it more difficult to determine the reason for a pupils' performance on the exercise. With only five words, the pupils may have aced the exercise simply as a result of remembering seeing the letter *a* alongside *t* and *p* rather than using letter-sound knowledge. For this reason, the lesson was assigned a 'systematicity indicator' rating of 1.

Observation notes on Teachers 11 and 12

Teachers 11 and 12 had very similar styles and so their teaching demonstrations and scope for improvement are jointly discussed.

Props. The teachers used two sets of five flashcards. The five flashcards in one set each with one target letter printed in both upper and lower case (e.g. *Aa*). The other set contained five word-picture flashcards, each with a word printed in lower case beneath its corresponding picture. The words each contained one target letter-sound rule.

Procedure. The teachers commenced by directing the class' attention to five flashcards on the blackboard, each with the letter printed in both upper and lower case (e.g. *Aa*, *Ee*, *Ii*, *Oo*, and *Uu*). They pointed to the capital letters and modelled the corresponding letter names, and then pointed to the lowercase letters and modelled corresponding letter sounds. For example, the teachers pointed to *A* and said [e], then pointed to *a*, and said [æ]. Following this, they presented a

word-picture flashcard with a word (e.g. *map*) alongside its corresponding picture. The flashcard was held up and the teachers announced, "*map* [mæp], [mæp]," requesting the class to repeat the sound. The same procedure was repeated for teaching the remaining four target letter-sound rules. Following this, the class was taken through the five letter-sound rules, the words, and the pictures. Finally, the word-picture cards were placed on the blackboard and a volunteer was invited onstage. The volunteer was required to point to the corresponding word-picture dictated by the teachers.

Scope for improvement for Teachers 11 and 12

Teachers 11 and 12 made an attempt to differentiate between letter names and letter sounds. Unfortunately, they also erroneously suggested associating uppercase letters with letter names and lowercase letters with letter sounds. The teachers also concentrated on teaching word meaning and whole-word pronunciation. Therefore, the lesson was given an 'explicitness indicator' rating of 1.

The exercise (i.e. match whole-word pronunciations to pictures/meanings) does not require letter-sound knowledge to process. Rather, it requires spoken vocabulary knowledge. Pupils with the spoken vocabulary can easily ace the exercise. For this reason, the lesson was also given a 'systematicity indicator' rating of 1.

Observation notes on Teachers 13 and 14

Teachers 13 and 14 had very similar styles and so their teaching demonstrations and scope for improvement are jointly discussed.

Props. The teachers used seven letter flashcards containing the letters *a, e, i, o, u, b* and *g* in lower case, respectively. The letter flashcards *b* and *g* were placed apart with a space equal to the width of a letter flashcard between them. The letter flashcards *a, e, i, o,* and *u* were placed one above the other.

Procedure. The teachers commenced by informing the class that they were going to teach the "different names of *a*, *e*, *i*, *o* and *u* [*sic*]." They directed the class' attention to the letter flashcard containing *a*, and said: "When *a* [e] is hiding in a group, its name is changed to [æ]." While saying so, the teachers moved the letter *a* to the space between the letter flashcards *b* and *g*. Then, the teachers modelled, "*b* [bi] - [b], *a* [e] - [æ], *g* [ʤi] - [g], [bæg]," and asked the class to repeat after them. The same procedure was repeated for teaching the remaining four target letter-sound rules. Following this, they took the class through the five letter-sound rules and the words. Finally, the students were given a class exercise. The teachers again had the letter flashcards *b* and *g* placed apart on one side of the blackboard. The letter flashcards *a*, *e*, *i*, *o*, and *u* were placed one above the other on the other side of the blackboard. The teachers dictated a word sound (e.g. [bæg]) and the class had to decide which one of the five letter flashcards should be placed between the letter flashcards *b* and *g*.

Scope for improvement for Teachers 13 and 14

The two teachers delivered the lesson explicitly and systematically, and therefore the lessons were given the maximum rating of 7 for both the 'explicitness' and 'systematicity indicators.'

Discussion

The study asked two pertinent but unanswered questions regarding Taiwanese EFL education: (1) What is the level of Taiwanese EFL teachers' letter-sound knowledge? (2) Can they deliver high-quality phonics instruction? A word reading test and teaching demonstration were used for the current investigation, and fourteen Taiwanese EFL teachers were examined. While the current sample was small, it encompassed novice and veteran teachers who had a Bachelor's degree in English-related studies, were working towards an MA in TEFL, and had taught or were still teaching children English at various teaching establishments.

The word reading test and teaching demonstrations yielded three important findings. One, there were gaps in the teachers' letter-sound knowledge. Two, improved linguistic knowledge (i.e. teachers' improved letter-sound knowledge, understanding the importance of letter-sound knowledge and phonics instruction in English literacy development, and knowledge of the individual role phonology, orthography, and morphology play as well as their interdependence in English literacy development) did not guarantee high-quality phonics instruction. Three, teaching experience neither correlated with letter-sound knowledge nor quality of phonics instruction. The three findings were consistent with western literature. As the examined teachers comprised a meaningful sample, the findings have a clear implication: pre-service or on the job training on letter-sound knowledge and how to deliver high-quality phonics instruction is very much needed for both novice and veteran Taiwanese EFL teachers working with children.

Accepting the limitations in current phonics teaching, what should be included in future training? Unfortunately, no standardised training programmes are available, and there have been only a small number of studies that focus directly on how best to prepare practicing teachers to deliver high-quality phonics instruction due to the once much divided opinion on how reading develops (National Reading Panel, 2000). However, with growing evidence showing that (1) letter-sound knowledge is the basis for basic reading comprehension and spelling, (2) such knowledge must be taught explicitly and systematically, and (3) many novice and veteran teachers are unskilled at relating letters to sounds and are unable to deliver high-quality phonics instruction, researchers have now begun to explore ways to improve teachers' knowledge. To improve teachers' linguistic knowledge, McCutchen et al. (2009) suggest work on enhancing (1) knowledge of relationships between phonology, orthography, and morphology, (2) knowledge of developmental stages in reading, and (3) teachers' own letter-sound knowledge. To improve quality of phonics instruction, coaching is highly recommended (e.g.

Hsieh, Hemmeter, McCollum, & Ostrosky, 2009). Directions for improvement are summarised below.

Directions for Improving Teachers' Letter-Sound Knowledge

Enhancing teachers' knowledge of relationships between phonology, orthography, and morphology

It is essential that teachers understand the individual role phonology, orthography, and morphology play as well as their interdependence in English literacy development to better focus their teaching and monitor children's learning. Phonemic awareness enables a child to differentiate between phonemes (e.g. [b] and [p]) and acquire oral vocabulary (i.e. spoken vocabulary). Orthography is the relationship between letter and sound. English orthography is not a one-to-one mapping system. An English letter almost always represents more than one sound (e.g. the letter *o* can be pronounced [o] for *go*, [u] for *do*, [ɔ] for *hot*; the digraph *ea* can be pronounced [i] for *tea*, [e] for *break*, and [ɛ] for *bear*), and a sound can be represented by more than one letter (e.g. [o] can be spelt as *o* for *go*, *oe* for *roe*, *oa* for *goat*, *ough* for *although*). Learning what letter or letters correspond to what sound or sounds (i.e. letter-sound knowledge) is crucial in literacy development, and this is the same for all alphabetic languages in the world. The difference is that the nature of English orthography makes it impossible for children to develop this knowledge without phonics instruction. Teachers must fully appreciate the importance of letter-sound knowledge and phonics instruction. Morphology enables children to connect sounds, spelling, and meaning (e.g. upon hearing the sound [s], the children can instantaneously associate the sound with its written form *s* and its meaning 'plural').

Enhancing teachers' knowledge of developmental stages in reading

Teachers must fully understand and appreciate that if reading is not taught, a native speaker will remain illiterate. What this infers is that reading acquisition will only happen with reading instruction, and that under normal circumstances, to become an expert reader, a native speaker also needs years of reading experience. However, when we finally become expert readers, we no longer have much perspective on how difficult reading really is, and we tend to think that identification and comprehension of a written word is a one-step process requiring only one glace. It is through reading research (e.g. Ehri, 1995; Frith, 1985), numerous cases of alexia (e.g. Marshall & Newcombe, 1966; 1973), and dyslexia (e.g. Wydell & Butterworth, 1999) that we are made aware of how complex it is to read English.

Teachers must understand how reading is developed. The classic model by Frith (1985) distinguishes three main developmental stages: the pictorial, phonological, and orthographic stages. These stages are sequential, but not rigidly partitioned. The first stage is the pictorial stage and includes the following typical features. One, children recognise their name and perhaps a few other familiar words such as brand names (e.g. ). Two, children identify words mainly by the global visual features such as shape, colour, letter orientation, and curvature. Failing to recognise known words (e.g. ) in a new guise (e.g. *COCACOLA*) is typical, and so is failing to differentiate between visually similar words (e.g. *who* and *what*). Such errors suggest that the child's brain, at this stage, is attempting to map the visual features of a written word as a whole directly onto a meaning, without attending to individual letters and their pronunciations (Nation, Allen, & Hulme, 2001). The second stage is the phonological stage. There are two developments at this stage. One, children gradually learn to break through the process of identifying words by their global contours. For example, they now know that similar looking written words (e.g. *eight* and *sight*) can be completely different

words (Rastle, David, Marslen-Wilson, & Tyler, 2000), and that words looking very different may in fact represent the same word (e.g. *height* and HEIGHT) (e.g. Mayall, Humphreys, Mechelli, Olson, & Price, 2001). Two, children also learn to associate letters with letter sounds and vice versa (e.g. Rey, Ziegler, & Jacobs, 2000). In summary, children no longer read by identifying the global features of the words. Rather, they now recognise and comprehend the meaning of a written word by converting its letters to sounds. This reading stage marks children's transition from treating a written word as a 'picture' to processing a written word as a 'written word'. The third and final reading stage, the orthographic stage, occurs when children have attained a certain level of expertise. At this stage, identification and comprehension of written words are instantaneously triggered on sight of a written word, and comprehension also becomes more and more governed by sentence context rather than spelling. Evidence of this stage comes from research findings that reading speed is determined by how frequent a word is encountered (Ellis, 2004), and that context is sufficient to allow experienced readers to comprehend meaning while automatically ignoring spelling errors (Dehaene, 2009).

It is very important for teachers to fully appreciate that: (1) reading is developed sequentially, (2) the orthographic stage only happens after years of practicing reading via converting letters to sounds, and (3) letter-sound knowledge must be taught explicitly and systematically.

Enhancing teachers' own letter-sound knowledge

Teachers must also re-familiarise themselves with letter-sound rules, or update their letter-sound knowledge, in order to teach the rules correctly. See Connelly (2002) for a detailed account of instruction intervention.

Directions for Improving Teachers' Quality of Phonics Instruction

A full appreciation of the importance of phonics instruction, however, is not equal to a full understanding of what high-quality phonics instruction includes. It is important that teachers fully understand exactly what high-quality phonics instruction includes. Taken from the skills emphasised in the UK and US National Curriculums, high-quality phonics instruction should include explicit and systematic teaching of:

- phonemic awareness so that pupils can differentiate between sounds (e.g. [e] and [ɛ] are different sounds),
- print awareness so that pupils will pay attention to the print,
- the 26 letters in both upper and lower case and in other guises (e.g. pupil can recognise a, a, *a*, ᴀ, A, *A* represent the same letter),
- when to read a letter using its letter name (e.g. read *a* as [e]) and when to read using its letter sound (e.g. read *a* as [æ]) with a systematic account,
- how to divide a word into single letters and/or letter groups (e.g. divide *sail* into *s*, *ai*, and *l*), produce their corresponding sounds (e.g. [s] for *s*, [e] for *ai*, and [l] for *l*), and string sounds together and read (aloud) as a word.

Explicit and easy-to-follow instruction assisted with systematic (meaningful) exercises is the only way to ensure that pupils learn the complex letter-sound knowledge.

A full understanding of what high-quality phonics instruction includes, however, is not equal to having the ability to deliver it. Coaching, grounded in a clinical supervision model using a cycle of pre-observation collaborative planning, practice while being observed, reflective feedback, and collaborative planning for the next coaching session, has been highly recommended for improving teachers' quality of instruction. This is because coaching takes place directly in the

classroom, helping teachers to acquire, enhance, or refine specific teaching behaviours (National Staff Development Council, 2001; the International Reading Association, 2004). A growing body of research has demonstrated positive effects for both peer and expert coaching (See Hsieh et al., 2009 for more detail).

Conclusion and Future Study

The current study was the first to investigate Taiwanese EFL teachers' ability to deliver high-quality phonics instruction by examining their word reading and phonics teaching demonstrations. Consistent with western literature, the current results show both novice and veteran teachers' letter-sound knowledge and quality of phonics instruction need improving. Directions for improvement were briefly discussed.

The current study can be further extended to include, and measure, effects of coaching on Taiwanese EFL teachers' quality of phonics instruction by classroom observation of teaching practice and pupils' letter-sound knowledge.

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Appendix 1. The complete word reading list and frequency values

Word Item	Frequency per Million	Word Item	Frequency per Million
fir	0.43	damp	0.16
roe	1.02	lose	164.35
hey	1727.04	tomb	0.06
vow	5.41	stain	6.20
mew	0.45	crude	3.04
pry	4.12	queer	5.80
vex	0.20	stall	8.96
key	86.86	laugh	62.86
bear	57.41	great	820.86
snow	31.35	straw	6.24
clay	12.00	sieve	0.53
laud	0.12	fudge	0.08
soup	25.20	bough	0.29
bard	0.80	suite	16.65
fair	94.75	fruit	21.73
pour	15.12	louse	1.69
sear	0.22	tough	90.51
veil	2.96	plight	1.24
toil	1.00	fetish	0.08
moat	1.18	vision	0.06
tort	0.18	thrive	1.75
knot	3.69	sought	4.71
dink	4.80	condemn	0.24
chew	9.06	junction	2.94
sign	133.27	freight	3.84
gnaw	0.37	phobia	4.08
tote	1.08	fraught	0.69
bide	0.55	through	549.53
rake	2.98	although	42.02
clue	17.61	Caucasian	2.75

Appendix 2. Participant performance on the word reading test

Participant	Y	Est	W	S	D	GpsL-S
1	6	PS	18	17	1	ir-[ɝ];ow-[aʊ]; ew-[ju]; y-[aɪ]; au-[ɔ]; ou [u]; i-[aɪ]; aw-[ɔ]; o_e-[o]; ough-[aʊ]; ui-[wi]; ou-[aʊ]; ough-[ʌf]; sie-[sɪ]; eigh-[e]; augh-[ɔ]; mn-[m]; mb-[m]
2	0.5	CS/PT	19	19	-	ir-[ɝ]; ey-[e]; x-[ks]; au-[ɔ]; ar[ar]; o_e-[o]; ei-[e]; oi-[ɔɪ]; ough-[aʊ]; ui-[wi]; ui-[u]; ou-[aʊ]; sie-[sɪ]; i_e-[aɪ]; ough-[ɔ]; eigh-[e]; augh-[ɔ]; mn-[m]; mb-[m]
3	4	CS/PT	15	15	-	ir-[ɝ]; oe-[o]; ow-[aʊ]; ea-[ɛ]; au-[ɔ]; ou [u]; ou-[ɔ]; aw-[ɔ]; c-[k]; sie-[sɪ]; ough-[aʊ]; ui-[wi]; eigh-[e]; mn-[m]; mb-[m]
4	15	CS/PT	8	8	-	au-[ɔ]; e [i]; sie-[sɪ]; ui-[wi]; ough-[ʌf]; eigh-[e]; mn-[m]; mb-[m]
5	4	CS/PT	13	13	-	ir-[ɝ]; ow-[aʊ]; au-[ɔ]; ou-[ɔ]; ei-[e]; oi-[ɔɪ]; or-[ɔr]; e-[i]; ea-[e]; sie-[sɪ]; ui-[wi]; mn-[m]; mb-[m]
6	2	CS/PT	11	10	1	ow-[aʊ]; ea-[ɛ]; au-[ɔ]; sie-[sɪ]; e-[i]; ui-[wi]; ou-[ɔ];ough-[ʌf]; o_e-[o]; mn-[m]; mb-[m];
7	2	CS/PT	17	17	-	ir-[ɝ]; ew-[ju]; au-[ɔ]; ou-[u]; o_e-[o]; u_e-[u]; e-[i]; augh-[æf]; ou-[ɔ]; ei-[e]; ui-[wi]; sie-[sɪ]; ough-[aʊ]; eigh-[e]; augh-[ɔ]; mn-[m]; mb-[m]

Participant	Y	Est	W	S	D	Teachers' gaps in L-S rules
8	4	CS/PT	17	17	-	ow-[aʊ]; y-[ai]; au-[ɔ]; ou-[u]; or-[ɔr]; aw-[ɔ]; ough-[aʊ]; ea-[i]; eigh-[e]; oi-[ɔɪ]; ui-[wi]; sie-[sɪ]; i_e-[aɪ]; ough-[u]; ou-[aʊ]; mn-[m]; mb-[m]
9	1	CS/PT	9	9	-	y-[ai]; au-[ɔ]; ou-[u]; o_e-[o]; sie-[sɪ]; eigh-[e]; mn-[m]; mb-[m] ough-[ɔ];
10	1	CS/PT	11	11	-	au-[ɔ]; ou-[ɔ]; aw-[ɔ]; e-[i]; ui-[wi]; ou-[aʊ]; sie-[sɪ]; ough-[aʊ]; ough-[u]; mn-[m]; mb-[m]
11	0.5	PT	11	11	-	au-[ɔ]; ou-[u]; ea-[i]; e-[i]; ui-[wi]; sie-[sɪ]; i_e-[aɪ]; augh-[ɔ]; ough-[aʊ]; mn-[m]; mb-[m]
12	0.5	PT	24	24	-	ir-[ɝ]; oe-[o]; ey-[e]; ow-[aʊ]; y-[aɪ]; ea-[ɛ]; ay-[e]; au-[ɔ]; ou-[ɔ]; oi-[ɔɪ]; oa-[o]; aw-[ɔ]; a_e-[e]; e-[i]; sie-[sɪ]; ui-[wi]; igh-[aɪ]; i_e-[aɪ]; ough-[ɔ]; ough-[ʌf]; eigh-[e]; augh-[ɔ], mn-[m]; mb-[m]
13	15	PS/PT	9	9	-	au-[ɔ]; aw-[ɔ]; e-[i]; sie-[sɪ]; eigh-[e]; mn-[m]; mb-[m] ui-[wi]; ou-[aʊ];
14	6	CS/PT	13	13	-	ow-[aʊ]; au-[ɔ]; ou-[ɔ]; ea-[i]; ough-[aʊ]; ui-[wi]; ough-[ʌf]; aw-[ɔ]; i_e-[aɪ]; ough-[ɔ]; augh-[ɔ]; mn-[m]; mb-[m]

NB: Y = Number of years teaching children English; Est = Type of establishment; PS = Primary school; PT = Private tuition; C = Cram school; W = Number of wrong answer; S = Number of sound substitution errors; D = Number of sound deletion errors.

Appendix 3. Description of the indicators of low, mid, and high-quality literacy focus

Indicators	Low (1, 2)	Mid (3, 4)	High (6, 7)
Systematic	Activities are not well planned to engage children in letters, words, or phonemes; the linkage between the current goals and previously learnt goals is not specified or evident	Activities are sometimes planned and organised in a a way that engages children in letters, words, or phonemes, and occasionally links the current goals to previously learnt concepts or skills	Activities are well-planned & sequenced, and teachers link the current goals to previously learnt concepts or skills
Explicit	Teacher rarely uses terms and strategies that make clear the relationship between oral and written language and the names of specific units or tasks (e.g. letter, rhyme, sound, word, etc)	Teacher inconsistently or only occasionally uses terms and strategies that make clear the relationship between oral and written language and the names of specific units or tasks (e.g. letter, rhyme, sound, word, etc)	Teacher uses terms and strategies that make clear the the relationship between oral and written language and the names of specific units or tasks (e.g. letter, rhyme, sound, word, etc)