

Do they know or don't they know? Insights into the knowledge of English foreign language reading teachers

Abstract

English foreign language teachers need basic content knowledge of the structure of the English language in order to teach beginning reading efficiently. The content knowledge was tested with a pre-test and post-test questionnaire given to pre-service and in-service teachers and was analysed by means of quantitative statistics. The results showed an overall improvement in the different areas of knowledge. Spelling did not improve enough and remained low. Application of this knowledge enables better understanding of the phonics approach to reading.

Keywords: *English foreign language (EFL) teachers; content knowledge; beginning reading; spelling, phonics.*

Introduction

Shulman (1986) says: “*Those who can, do. Those who understand, teach*” (p. 14).

Over the past fifteen years teachers of beginning reading in English as a foreign language found that far too many children were not mastering the basic requirements for efficient decoding and disproportionate numbers were turning into "non-readers" when they reached junior high school. Due to the fact that during their teacher training they were not given enough instruction on how to teach basic decoding they were desperate to find guidance. Their feelings of frustration and negative self-efficacy led them to look for solutions to their problems. Therefore they took an independent decision to participate in the course for beginning reading for dyslexic and at risk readers in the hope that this would improve the overall situation. They were taught how to apply an Explicit Multisensory Intervention Program (EMPI) which gave them the knowledge and practices which they could adopt in their classrooms. The course was given as part of a professional development program for both pre-service and in-service teachers. The first part of the course included knowledge of

the structure of the English language which was taught over a number of sessions. According to Garet et al. (2008) increased content knowledge leads to changes in practices when incorporated in a professional development program. Acquisition of knowledge was the foundation for the change from negative to positive self-efficacy that these teachers underwent.

In order to teach beginning reading effectively it is necessary for teachers to consolidate a basic knowledge and understanding of the structure of the English language (Fielding-Barnsley, 2010; Moats & Foorman, 2003). Content knowledge is knowledge of subject matter (Shulman, 1987), and is the prerequisite to skilful teaching. Teachers need to acquire a basis of theoretical subject matter related to the subject they teach (Moats, 2014). Therefore the acquisition of knowledge is a basic requirement of professional development (PD) According to Guskey (1986, p. 6) PD "... can expand knowledge and skills, contribute to their (teachers) growth and enhance their effectiveness with students". It acts as "*the essential mechanism for deepening content knowledge and developing teaching practices*" (Desimone, Porter, Garet, Yoon, & Birman, 2002, p. 81).

The questionnaire on the teachers' knowledge of the English language examined their knowledge of different areas. In order to teach beginning reading they need to recognize basic concepts of phonics and to differentiate between long and short vowels. They have to be able to understand the importance and recognize different kinds of syllables within a word and be able to count them. Since phonemic awareness is an indicator of a child's ability to learn to read (Ziegler & Goswami, 2005) a section on phoneme counting was included. All of these aspects of professional knowledge are essential for teaching beginning reading in EFL. Finally teachers were asked about their understanding of basic terminology related to phonics. The researcher hypothesized that teachers' knowledge was not up to standard in these different areas and needed to be taught. The pre-test questionnaire showed this to be correct.

Literature review

High quality professional development targets the professional growth of the individual teacher and provides access to different kinds of knowledge which change their teaching (Borko, 2004; Garet et al., 2008; Garet, Porter, Desimone, Birman, & Yoon, 2001; Ingarson, Meiers, & Beavis, 2005). Shulman (1987) identified the acquisition of different types of knowledge as being necessary for the development of expert teaching. Teachers must be provided with the knowledge of their subject matter (content knowledge) and how to teach it (pedagogical content knowledge) so that they will be enabled and know how to improve the learning outcomes of their pupils.

EFL elementary school teachers need to consolidate this knowledge because it serves as a basis for the teaching of systematic explicit phonics which brings about strong word

recognition and spelling (Goldfus, 2012; Phelps & Schilling, 2004; Kahn-Horwitz, 2015; Kahn-Horwitz, 2016; McNeill & Kirk, 2014). A reader must be taught to make a connection between the letters in the spelling and the sounds of the pronunciation (Ehri, 2005). These skills are the basis for accurate and fluent reading that enables the reader to comprehend the print (Adams, 2003; Ehri, 2005; Share & Stanovich, 1995; Rayner, Foonman, Perfetti, Pesetsky, & Seidenberg, 2001). Without this important knowledge it will be difficult to teach novice readers efficiently and to prevent reading failure in the future.

The following research question was addressed:

Which aspects of the teachers' knowledge changed during the program and to what extent?

Methods

Design

A quantitative study was carried out using a questionnaire to test teachers' knowledge

Participants

A total of 147 participants took part in pre- testing quantitative part of the study.

The population of this research consists of pre-service EFL teachers and in-service EFL teachers in Israel. Pre-service teachers and in-service teachers were sampled from two academic colleges in the north of Israel. The participants in the research reflect the continuum of EFL teachers in Israel. They range from pre-service student teachers still in training at the local Teachers Training Colleges through to veteran teachers with a minimum of three years of experience in the field to teachers about to go on pension.

Pre-service teachers

The pre-service teachers were students at the colleges who were participating in courses to complete their B.Ed. degree and were studying in either second, third or fourth year. Another small group was adult academics who were retraining to become English teachers. They were participating in an intensive two year course to obtain a teaching certificate recognized by the Ministry of Education which enables them to go into the field and teach EFL. The majority were female (90%), usually 20-30 years old. The group included both students who were L1 Arabic or L1 Hebrew speakers. It also included several students who were native speakers of English, Russian and Spanish.

In-service teachers

The in-service teachers were teachers who were participating in courses related to dyslexia being given at the college within the framework of professional development. They all had a minimum experience of three years teaching EFL in the field. Some were junior high school teachers who were looking for practical solutions to the non-readers in their classes. Most of the teachers were not native speakers of English but were proficient in reading and writing.

Sample of students in EMPI program

Data were collected over 5 years with eight classes.

Overall, there were 147 students at pre-test and 116 at post- test, from eight groups of students, as shown in Table 1. Pre-test groups included 12 to 31 students, averaging at 18.38 per group (SD=6.37), and post-tests groups included 6 to 25 students, averaging at 14.50 per group (SD=5.63). Details by group and time are provided in Table 1.

Table 1
Distribution of students by group and time (N=263 questionnaires)

Group	Pre test (N=147)		Post test (N=116)		Total	
	N	%	N	%	N	%
1	31	21.1	6	5.2	37	14.1
2	17	11.6	15	12.9	32	12.2
3	12	8.2	11	9.5	23	8.7
4	17	11.6	16	13.8	33	12.5
5	13	8.8	11	9.5	24	9.1
6	14	9.5	14	12.1	28	10.7
7	24	16.3	25	21.5	49	18.6
8	19	12.9	18	15.5	37	14.1
Total	147	100.0	116	100.0	263	100.0

It should be noted that except for group no. 1, post-test groups were similar in size to pre-test groups ($Z=1.73$, n.s.). Group no. 1, however, was smaller at post-test than at pre-test.

Instruments

Knowledge questionnaire

The purpose of the knowledge questionnaire (appendix 1.) was twofold: first, to test the knowledge of both teachers and students in order to develop a picture of the standard of

content knowledge, and the standard of knowledge related to the structure of written and spoken language which is needed for the instruction of beginning reading, that existed in the field. Second, the purpose was to assess change in knowledge as a result of the EMPI program.

The questionnaire is based theoretically on Ehri (2002, 2005) and Adams (2003) who emphasize the importance of the application of phonological and orthographic knowledge to the explicit teaching of beginning reading.

In light of these theories, questions in the questionnaire were adapted from the Phonics Quiz (Lerner, 1989) and the Informal Survey of Linguistic Knowledge (Moats, 1994), both of which focus on the structure of written and spoken language structure. The researcher either kept the original wording of the questions and changed the examples to fit the students' world, or assessed the same concepts and changed the wording using adapted examples. Once the questionnaire was compiled an expert opinion was obtained regarding its contents, and it was piloted with several teachers who were past students in the program.

The questionnaire was made up of 39 items, pertaining to seven content areas, and organized in three sections which checked the standard of the content knowledge related to reading and spelling. All questions had forced choice responses, of which one was correct and others were wrong. **Part I** (questions 1-17) checked teacher knowledge of phonics, composed of five areas: concepts of phonics (questions 1-6, 8-12, $\alpha = .67$), knowledge of vowels (questions 7, 15, $r = .01$, non-significant), differentiation between syllables (questions 13, 14, $r = .37$, $p < .001$), phoneme counting (question 16, $\alpha = .66$), and syllable counting (question 17, $\alpha = .61$). The correlation for knowledge of vowels is low, reflecting the fact that knowledge of one item was not indicative of knowledge of the other item. Other correlations and internal consistencies are within the acceptable range.

Students were expected to recognize examples of basic terms needed for the teaching of beginning reading. Moats (1994, p. 81) refers to it as "The missing foundation in teacher education". Once this knowledge is internalized and understood teachers will be able to teach phonics and deal with the difficulties faced by a wide range of readers particularly those at risk.

The five areas of Part I were:

Concepts of phonics (Questions 1-6 and 8-12)

These questions evaluated knowledge of phonics, and students were asked to recognize examples of basic terms needed for the teaching of beginning reading. For example:

1. A word with a consonant digraph is

- a) stare b) blend c) send d) strict e) chest

Knowledge of vowels (Questions 7; 15)

The purpose of these two questions was to determine if the respondent could recognize phoneme grapheme correspondences.

For example:

7. If *aik* were a word, the letter *a* would probably sound like the *a* in

- a) black b) make c) again d) coat e) call

Differentiation between syllables (Questions 13; 14)

The purpose of these two questions was to see if the respondent was able to recognize and differentiate between open and closed syllables.

For example:

13. A word with an open syllable is

- a) hike b) go c) spend d) butter e) it

Phoneme counting (Question #16)

This question included nine words which had to be broken down into phonemes. The aim was to determine whether teachers of reading had insights into phonemic awareness. If they were unable to carry out this activity they would not be in a position to provide phonemic awareness instruction which is an important prerequisite to reading.

For example:

16. Phoneme Counting

Count the number of speech sounds or phonemes that you perceive in each of the following spoken words. Write the number of phonemes on the line.

drill____(4) sing_____(3) shook_____(3) know_____(2)

Syllable counting (Question #17)

This question included six words which had to be broken down into syllables. The aim was to determine knowledge of the concept of syllable division. Syllable conventions are necessary for decoding and spelling words, particularly as the texts being read become more sophisticated. This enables the pupil to read multi-syllabic words fluently. If a teacher lacks this knowledge, he/she will not be able to explain how to decode longer words. The pupil will have difficulties decoding and spelling words of two or more syllables and good comprehension will not be achieved.

For example:

17. Syllable Counting

Count the number of syllables that you perceive in each of the following words.

lighten_____ (2) shirt_____ (1) banana _____ (3) international_____ (5)

Part II of the questionnaire deals with the category of **spelling rules (orthography)**, and contains four multiple choice questions (Part II: questions 1-4, $\alpha = .33$). Each question defines a basic spelling rule. The low internal consistency reflects the fact that knowledge of some items was not indicative of knowledge of others.

The student has to identify an example of the rule from the four possibilities which are provided.

For example:

2. Which word is an example of the spelling rule: when two vowels are written together the long sound of the first vowel is the only sound pronounced. (When two vowels go walking the first does the talking.)

a) boil b) slit c) fail d) dame e) mouse

Part III deals with the category of **reading terminology**, and contains five multiple choice questions (Part III: questions 1-5, $\alpha = .59$) related to the basic terminology that is connected to the teaching of reading. This is the type of terminology a teacher should be familiar with in order to teach. This internal consistency is the minimum required.

For example:

2. Phonics is the application of _____ to the teaching of reading.

a) morphology b) phonology c) syntax d) whole language

Internal consistency for the total knowledge score, of the whole questionnaire, was good: $\alpha = .82$.

Research procedures

The knowledge questionnaire was administered to the full spectrum of EFL teachers ranging from pre-service students through to veteran in-service teachers who were participating in the program. It was administered anonymously as pre-test and as post-test in order to determine the level of the participants' content knowledge related to the teaching of beginning reading. Responding to it took about 30 minutes.

Analysis

The Knowledge Questionnaire was analysed by means of quantitative statistical analysis comparing pre and post- test knowledge. First, internal consistencies for the items composing

the various content areas were calculated with Cronbach's alpha (α). Multivariate analysis of variance (MANOVA) was used to assess pre-test group differences in the content areas of knowledge and a univariate analysis of variance (ANOVA) was used for the total knowledge score. Another multivariate analysis of variance (MANOVA) was used to test pre-post differences in the content areas of knowledge, and a univariate analysis of variance (ANOVA) was used for the total knowledge score. Further, knowledge in the different content areas was rank ordered with two repeated measures MANOVAs- for pre and post-tests, with post hoc paired comparisons.

Ethical Considerations

Before the Knowledge Questionnaire was administered the participants signed a Form of Consent allowing the researcher to use the data for research purposes. They were assured that their responses would not affect their grades for the course in any way and that confidentiality would be adhered to. Furthermore, it was not compulsory to submit the questionnaire on completion.

Research Findings

Knowledge is a basic component of the process of PD and is central in the conceptual framework of this research.

The results showed (see table 2) that teachers lacked the knowledge needed to teach beginning reading (at pre-test). The possibility of success was low and they needed to undergo a process of PD that would consolidate their basic knowledge from the outset.

The research question focused on the teachers' knowledge of phonics and the extent to which it changed during the program. As it may be recalled the knowledge questionnaire was filled out prior to the program and after its end by teachers in eight groups. No significant differences were found among the groups at the pre- test level in the content areas.

Main Analyses

The change in knowledge came about as a result of participation in the EMPI program. Table 2 presents pre-post differences, i.e., change in knowledge, in the various content areas. In addition, knowledge is rank ordered by content area, and inter-correlations between the content areas are examined.

Pre-post differences in knowledge

Pre-post differences were examined with a multivariate analysis of variance for the content areas, and a univariate analysis of variance for the total knowledge score. Means and standard deviations by time, as well the F tests are presented in Table 2.

Table 2
Means and standard deviations of knowledge by content area and differences by time
(N=255)

	Pre-test (N=140)	Post-test (N=115)	Difference
	M (SD)	M (SD)	F(1,253) (η^2)
Concepts of phonics	49.87 (15.97)	72.09 (18.91)	103.50*** (.29)
Knowledge of vowels	78.93 (28.17)	85.65 (23.66)	4.15* (.02)
Differentiation between syllables	63.93 (37.49)	86.96 (28.93)	19.13*** (.10)
Phoneme count	48.73 (24.52)	60.97 (23.33)	16.42*** (.06)
Syllable count	72.86 (24.51)	79.42 (20.86)	5.17* (.02)
Spelling rules	38.39 (23.88)	45.22 (28.47)	4.34* (.02)
Terminology	56.57 (26.92)	73.04 (23.40)	26.56*** (.10)
Total knowledge score	54.77 (13.21)	69.41 (14.35)	73.51*** (.22)

* $p < .05$, ** $p < .01$, *** $p < .001$

For content areas: $F(7, 247) = 17.08$, $p < .001$, $\eta^2 = .33$

The table shows significant differences in all content areas, as well as in the total score. The participating teachers have significantly increased their knowledge level in all content areas. It may be noticed that the highest differences are in concepts of phonics, the total knowledge score, differentiation between syllables and terminology, while the lowest differences are in syllable count, spelling rules and knowledge of vowels. Graph 1 demonstrates the change in knowledge.

The total pre-test knowledge score was 55 (of 100) which is low. It increased to about 70. Lowest was knowledge of spelling, which remained low. Low too were concepts of phonics, knowledge of phoneme count and terminology but they increased significantly. Relatively high were knowledge of vowels and syllable count, and both increased. In the end spelling was still low, yet knowledge in all other areas was at least at the level of 60 points (on average), and ranging up to 87.

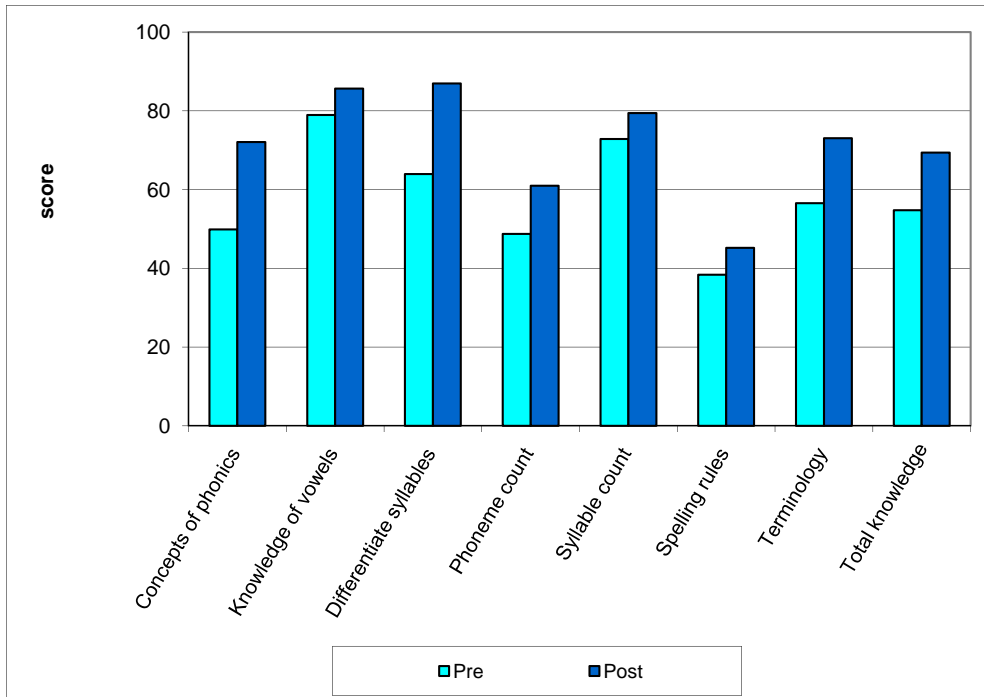


Figure 1: Teachers' Knowledge by Time

Rank ordering of knowledge

Rank ordering the knowledge in the content areas was conducted with two repeated measures MANOVA. That is, scores of knowledge in the seven content areas were rank ordered at pre- and at post-test. Rank ordering the scores was found significant at both times: for pre-test $F(6,840)=46.55$, $p<.001$ $\eta^2=.25$, and for post-test $F(6,684)=55.95$, $p<.001$, $\eta^2=.33$.

At pre-test scores for knowledge of vowels were the highest, higher than the scores for syllable count. These were higher than the scores for differentiation between syllables and terminology, which in turn were higher than scores for concepts of phonics and phoneme count. The lowest scores were achieved for spelling rules.

At post-test scores for differentiation between syllables and knowledge of vowels were the highest, higher than the scores for syllable count. These were higher than scores for terminology and concepts of phonics, which in turn were higher than the scores for phoneme count. Lowest were the scores for spelling rules.

It is interesting to note that although knowledge is significantly higher at post-test than at pre-test, the order of knowledge by content areas remained rather similar. In other words,

highest scores were found for syllable count, knowledge of vowels and differentiation between syllables, and lowest scores were found for spelling rules.

Summary of results of the research question

Results showed a significant increase in knowledge in all content areas. No differences were found between the groups at the beginning of the program. That is, despite the fact that some were pre-service teachers and others were in-service teachers, knowledge was quite narrow. Significant increases were noted in all content areas, as well as in the total knowledge score, at the end of the program. The highest increases were in concepts of phonics, differentiation between syllables and terminology, and the lowest were in syllable count, spelling rules and knowledge of vowels. Knowledge of spelling rules did not improve enough and remained low.

Discussion

Change in Knowledge

Content knowledge is the first component of the process of PD that has to be consolidated. A pre- test and post- test were administered to the full spectrum of EFL teachers ranging from second year pre-service students to experienced in-service teachers. The aim of the questionnaire was to determine whether the respondents' content areas of knowledge (concepts of phonics, knowledge of vowels, differentiation between syllables, phoneme count, syllable count, spelling rules, and terminology) improved at the end of the program. A comparison between the results of pre-test and post-test shows that there was a meaningful increase in all the content areas as well as in the total knowledge score.

Understanding of content knowledge is a basic requirement for teaching a subject (Shulman, 1987). Pre-test results showed that both pre-service and in-service teachers were not familiar enough with terminology related to phonics reading instruction. They also lacked an understanding of the progression of sound combinations needed to teach beginning reading. Phonics enables the reader to decode unknown words, to internalize spelling patterns and to accelerate fluency (Mesmer & Griffith, 2005). Therefore, teachers need to have basic understanding of special features of the English language such as phonemes, spelling patterns in order to teach reading and spelling (Moats, 2000).

The teachers participated in a program of 56 academic hours which taught a systematic phonics approach to beginning reading. In all the areas their content knowledge improved. As the result of the process of PD the teachers had a solid basis to begin the teaching of phonics either individually or in their regular classrooms.

Components of Phonics Instruction

Concepts of Phonics

The greatest increase in knowledge was seen in the area of concepts of phonics which is the basis to the application of a phonics approach to reading (the results went from 49.9 % to 72.1 %). Phonics instruction develops good word recognition skills (Borko, 2004; Chall, 1997; NRP, 2000) and is supported by research (Adams, 2003; Chall, 1967; Ehri, 2004; Johnston & Watson, 1997; Moats, 2000). The teachers learned to differentiate and name the orthographic patterns and to understand the logic behind the order in which they should be taught. Phonics is the preferred method for teaching beginning reading in EFL (Eskey, 1992) and knowledge of concepts of phonics is essential for this purpose.

Significant changes were noted in areas that had not been part of the teachers' knowledge prior to the participation in the program. They were unaware of a definition of the terminology related to phonics, and they were unable to recognize an example which represented a particular concept. For example, the term **blends** was a new concept and an increase from 43.5 % who answered correctly at pre-test to 87.1% at post-test was noted. Three other questions also showed meaningful improvement. They include recognition of a **diphthong**, a word with a vowel or consonant **digraph** the definition of a **long vowel sound** and **the schwa sound**, as described below.

Diphthongs: Only 15% of the teachers were aware of the concept in the pre-test compared with 51.7 % by the end of the program. This result did not surprise the researcher, and better knowledge is still required beyond the 51.7%. During Grade 4 not all the basic 44 sounds are taught. In Grade 5 teachers presume that children can read and almost no time is given to the teaching of complicated sound patterns such as diphthongs. The children are never taught these issues explicitly and are expected to become proficient readers without sufficient exposure or practice, According to Stanovich (1985) children need guided instruction at the initial stages of learning to read.

Vowel and consonant digraphs: The respondents also lacked understanding of the concept of a digraph. Only 13.7% initially recognized a word with a vowel digraph and 16.3% were able to pick out a word with a consonant digraph. By the end, 48.3% were able to recognize vowel digraphs and 57.8% consonant digraphs. These are sound patterns that are taught by teachers in the field, but nevertheless they lacked basic recognition and understanding. The post test showed significant improvement, yet, still, better knowledge is needed. Ehri (2005) recommends explicit instruction which is taught systematically so that word recognition will be strengthened. About half to 60% of the teachers had acquired the knowledge to perform this important task.

The Schwa sound: Another example finding was the fact that teachers were unaware of the schwa sound (an unaccented syllable such as the first syllable in the word "*about*"). The

teachers could not identify the schwa sound even though the word comes from Hebrew and is the sound of one of the vowels. 22.5% of participants could recognize it in the beginning and 50.0% understood the term in the end. Improvement in their knowledge can be noted here, and more is needed.

Knowledge of Vowels

Prior to the program most teachers knew that the English alphabet was made of vowels and consonants and recognized their grapheme representations. The additional knowledge that they acquired during the program was the terminology of short and long vowels and a deeper understanding of the different variations of long vowels and their complexity, particularly for spelling. They were able to recognize a long vowel in a written word and showed improvement in this area (72.7%- 83.5%). However at the pre-test stage only 33.3% were aware of the fact that the long vowel sound is the same as the name of the letter, which improved to 60.3% at the post test stage. The names of letters help reinforce the sounds and provide cues for word identification (Ehri, 1991; Ehri & Roberts, 2006).

The teachers were also unfamiliar with concept of a vowel digraph (for example *-ai-*, *-ee-*, *-oa-*, *-ea-*). At the pre-test stage 13.7% recognized a word with this combination which improved to 48.3 % after the post test. Due to the complexity of the English orthography this content area is difficult to master. When children learn to identify sound patterns in words they connect them to letter patterns thereby strengthening their insights into spelling (Medwell, 2002). The teachers realized the complexity of vowel digraphs and the need to emphasize them since they are an integral part of the reading system but complicate spelling.

Differentiation between Syllables

Knowledge of syllable differentiation was moderate at the pre-test (63.9%) and improved remarkably (87.0%). Many children find reading longer words difficult and they must be taught to break words into recognizable chunks. For that purpose, the teaching of phonics places an emphasis on the differentiation of syllables. According to Ehri's Phase Theory of Sight Word Reading (2005) during the consolidated alphabetic phase the reader learns to read orthographic patterns that recur in words and how to pronounce them. The student is taught to break multisyllabic words down into syllables and to recognize common affixes. Therefore, teachers need knowledge of syllable division so that their students can be taught to apply this skill (Carroll, Gillon, & McNeill, 2013). In the past this basic tool had been overlooked and pupils were expected to decode longer words intuitively or to guess. This led to the emergence of "non-readers" who never moved beyond one syllable words. Teachers did not discern between open and closed syllables and consolidated this knowledge during the PD program. 52.7 % of the respondents knew what an open syllable was but showed improvement by the end of the program when 84.5 answered correctly. The program taught

them to incorporate syllable division into their teaching repertoires so that they could enable their students to decode multisyllabic words. Consolidated – alphabetic readers use larger chunks of letters such as syllables when they read (Ehri, 2005).

Phoneme Counting

Knowledge of phoneme counting was quite low at the beginning (48.7%) and increased significantly (61.0%). The post test score was not as high as the result for terminology or phonics, but better than the score for spelling. Pre-school children and novice readers in Grade 1 who master phonemic awareness and are able to count the number of phonemes in a word will learn how to read (Ehri et al., 2001; NRP, 2000). Therefore, phonological awareness, particularly phonemic awareness, is an important pre-requisite for beginning reading. Sight word recognition is reinforced by the ability to analyse the phonemic structure of words and to connect it to the grapheme phoneme correspondences (Ehri, 1992; Stuart, Masterson, & Dixon, 2000). Teachers had to learn to count phonemes in words. They needed to be able to do this so that they could understand how to teach phonemic awareness properly. For example, the word *mix* has 4 sounds. Only 14.4% knew this at the pre-test level but there was an improvement to 40%. The understanding that the letter x has two sounds was a new concept for the teachers. This was a totally new area of knowledge that the teachers had to internalize, since they had been using a whole language approach with a major emphasis on global reading. In the opinion of the researcher the teachers did not show enough improvement in this area. It is uncertain whether the teachers had internalized the importance of this area of knowledge and whether they would incorporate it effectively into their teaching practices. Focused attention should be placed on phonemic awareness in the future.

As phonemic awareness is “*the ability to focus on and manipulate phonemes in spoken words*” (Ehri, 2002, p. 111), it is a prerequisite to reading. An important innovation of the program was heightening the understanding of the importance of phonemic awareness. Success in reading and spelling is boosted if children consolidate phonemic awareness before the commencement of formal reading instruction (Lundberg, Frost, & Petersen, 1988). Teachers had to learn to count the correct number of phonemes in words. This was a skill they had never been exposed to in the past. They needed to be able to do this so that they could understand how to teach phonemic awareness properly. For example, the word *mix* has 4 sounds. Only 14.4% knew this at the pre – test level but there was an improvement to 40%. The understanding that the letter x has two sounds was a new concept for the teachers. Although a significant improvement was noted in this area, more work is needed.

Syllable Counting

Most teachers (72.9%) were familiar with the ability to count the number of syllables in a word, and still, a significant, though slight improvement to 79.4%, was evident. Breaking

words into syllables is a stage in the acquisition of phonological awareness, and beginner readers are able to manipulate spoken units that are bigger than phonemes (Lieberman, Shankweiler, Fischer, & Carter, 1974). Teachers intuitively knew how to break words into syllables, but needed additional knowledge about breaking multisyllabic words into separate syllables. According to Ehri and McCormick (1998) students need to recognize vowel nuclei and then be able to pronounce each vowel together with the adjacent consonants so that they are read as separate syllables. They were taught to recognize different kinds of syllables, and were shown how to apply this skill to decoding longer words. This was an innovation of the program and area of knowledge which they had never been taught in the past.

Spelling Rules

Knowledge of spelling rules showed very little improvement and proved to be the weakest area of knowledge. Spelling received the lowest score in the beginning (38.4%), and although it increased significantly, it was still the lowest at the end (45.2%). The Israeli school system does not provide explicit instruction in spelling and teachers do not know how to teach it systematically. Therefore, the weak results did not come as a surprise.

“...spelling instruction underpins reading success by creating an awareness of the sounds that make up words and the letters that spell those sounds” (Joshi, Treiman, Carreker, & Moats, 2008-2009, p. 6). Despite this fact, research has shown that teachers lack the linguistic knowledge and skills in L1 that are needed for focused, systematic language focused reading and spelling instruction (Moats & Lyon, 1996; Bos, Mather, Dickson, Podhajski, & Chard, 2001). The ability to spell (encoding) reinforces decoding and strengthens the awareness of spelling patterns and spelling sound relationships which are needed for reading and writing (Adams, 2003). As part of pre-service and in-service training knowledgeable teacher trainers should provide intensive instruction in spelling since (Joshi et al., 2009; McNeill & Kirk, 2014) it is a critical component of literacy acquisition (Joshi & Carreker, 2009). Despite the fact that time was devoted to the teaching of spelling the results reflected only a minor improvement.

In the past spelling rules were not taught to pupils in school or to in-service or pre-service teachers and very little attention was given to the teaching of spelling according to sound patterns. Instead, students were expected to learn vocabulary words according to themes such as animals, food or parts of the body, by memorizing the letter sequences. Visual memorization of words is not an effective way for learning how to spell (Caravolas, Kessler, Hulme, & Snowling, 2005; Cassar, Treiman, Moats, Cury Pollo, & Kessler, 2005). In the future, longer time should be devoted to the teaching of spelling and perhaps other ways of teaching spelling should be designed.

Terminology

The teachers' knowledge of terminology related to phonics also improved significantly from 56.6% to 73.0%. During the program the teachers were frequently exposed to the terminology. Phonemic awareness was taught from both a theoretical and practical point of view. Geva and Siegel (2000) found that in addition to letter names, phonemic awareness is a basic essential pre-reading requirement in EFL or L2. Furthermore, the method of reading instruction taught was phonics as opposed to global approaches that had been used in the past. Both phonemic awareness and phonics should be taught intensively when the reading program has been adapted to the needs of the EFL novice reader (Manyak & Bauer, 2008). The concepts of grapheme and phoneme were used all the time since the association between them forms the basis to decoding. The novice reader must be able to match graphemes to phonemes and then to blend the sounds into words. This is an integral part of word recognition (Ehri, 2005). The EMPI program applies a multisensory approach and it was also demonstrated and emphasized frequently during the program. An explicit multisensory approach to intervention should be used to teach novice EFL readers (Lesaux & Siegel, 2003; Vaughn, Mathes, Linan-Thompson, & Francis, 2005).

As a result of the process of PD, teachers underwent an improvement in their acquisition of knowledge in most content areas. This enables them to begin teaching reading instruction effectively.

Limitations

Validity of the Knowledge Questionnaire: As it may be recalled from the methodology chapter, the researcher based the content of **the Questionnaire #1 on two** other existing questionnaires: the Phonics Quiz (Lerner, 1989) and the Informal Survey of Linguistic Knowledge (Moats, 1994). The original questions were either retained or slightly changed, assessing the same concepts. Relevant examples were used, that differed from the original ones. The questionnaire was piloted with an EFL teacher and several past students. In retrospect, questions #7 and #15 should be removed because the answers were obvious. Other questions assessing phonemic awareness and the ability to manipulate sounds in words should be added, such as: "what is the third speech sound in the word 'vision' ", as well as questions related to morphology.

The dual role of researcher and lecturer:

In this research the researcher took on a dual role of both researcher and teacher.

The role of the researcher could have impacted on the lecturer. The researcher was aware of the fact that this knowledge, covered in the questionnaires, was lacking and maybe subconsciously placed more emphasis on the related issues so that improvement could be

seen at the post test stage. It was important for her to know that the material was taught thoroughly and retained as well as possible.

Conclusions and Implications

Knowledge is the basis of any PD process and serves as a spring board to other areas of impact. The teachers' lack of knowledge led to student failure, resulting in the teachers' personal feelings of negative self- efficacy. This research confirmed that knowledge can be acquired and internalized. Ehri (2002, 2005) and Adam's (2003) theories served as the theoretical basis for the content knowledge that the EFL teachers acquired. The application of consolidated knowledge into practice may result in more effective teaching in the classroom and the teachers' feelings of positive self-efficacy. It is clear that knowledge should be a key area of impact in any model of PD.

The professional profile of EFL teachers in Israel is composed of different cultural and ethnic groups such as Jews, Arabs, Druze, Christians etc. However, the teacher training is uniform and complies with the requirements laid down by the English Inspectorate and Ministry of Education. Therefore, I believe the results of the given questionnaire reflect a realistic picture of the standard of content knowledge required to teach beginning reading.

Developers of PD programs for EFL teachers or other areas must incorporate relevant content knowledge related to the subject that will be taught. This will assure the desired changes in practices and beliefs and bring about effective instruction. Moreover, relevant content knowledge should not only be a part of PD programs but integral to (EFL) teacher training because it is a prerequisite to skilful teaching.

Appendix 1: Knowledge Questionnaire

Roffman 2005

Based on Phonics Quiz (Lerner, 1989) and Informal Survey of Linguistic Knowledge (Moats, 1994).

Part I: Phonics Quiz

Choose the correct answer.

1. Which of the following words begins with a consonant sound?
a) **piano** b) apple c) event ytd) out e) unite
2. A combination of two or three consonants pronounced so that each letter keeps its own identity is called a
a) consonant b) vowel pair c) schwa d) diphthong e) **consonant blend**
3. A word with a consonant digraph is
a) stare b) blend c) send d) strict e) **chest**
4. A *soft c* is in the word
a) cone b) cape c) chide d) chimpanzee e) **centre**
5. A *hard g* is in the word
a) general b) **go** c) gin d) ridge e) giant
6. Which word contains a long vowel sound?
a) story b) send c) hall **d) cream** e) open
7. If *aik* were a word, the letter *a* would probably sound like the *a* in
a) black **b) make** c) again d) coat e) call
8. Which word contains a short vowel sound
a) great b) cart c) clip d) saw e) mail
9. A vowel sound represented by the alphabet letter name of the vowel is a
a) short vowel **b) long vowel** c) diphthong d) digraph e) schwa
10. An example of the schwa sound is found in
a) hidden b) morpheme c) stopping d) preview e) grouping
11. A diphthong is in the word
a) coat **b) boil** c) battle d) retarded e) slate

12. Which word contains a vowel digraph

- a) soil b) amazing c) nappy d) cape **e) boat**

13. A word with an open syllable is

- a) hike **b) go** c) spend d) butter e) it

14. A word with a closed syllable is

- a) throw b) see c) why d) cow **e) win**

15. If *kly* were a word, the letter *y* would sound like the

- a) *e* in peel b) *e* in set c) *i* in in **d) i in isle** e) *y* in baby

16. Phoneme Counting

Count the number of speech sounds or phonemes that you perceive in each of the following spoken words. Remember, the speech sounds may not be equivalent to the letters. For example, the word "spoke" has four phonemes: /s/, /p/, /o-e/, /k/.

Write the number of phonemes on the line.

drill ___4___

sing ___4___

says ___3___

shook ___3___

mix ___4___

shrimp ___5___

sawed ___3___

quack ___4___

know ___2___

17. Syllable Counting

Count the number of syllables that you perceive in each of the following words. For example, the word "higher" has 2 syllables, the word "threat" has one and the word "physician" has 3.

lighten ___2___

shirt ___1___

coil ___1___

banana ___3___

talked ___1___

international ___5___

Part II: Spelling Rules

1. A nonsense word that does not follow English spelling patterns is

- a) thease **b) boyn** c) squite d) drow

2. Which word is an example of the spelling rule: when two vowels are written together the long sound of the first vowel is the only sound pronounced. (When two vowels go walking the first does the talking).

- a) boil b) slit **c) fail** d) dame e) crow

3. Which word is an example of the spelling rule: no original words in English end with the letter /i/.
- a) pie b) play c) toy **d) try** e) high
4. Which word is an example of the spelling rule: in words with a vowel-consonant-e pattern (VCe), the vowel frequently has the long sound while the e is silent.
- please b) mouse **c) flute** d) cheese e) cable

Section III: Terminology

1. A Multisensory approach to reading emphasizes:
- a) sight as much as possible.
b) memory as much as possible.
c) **the use of as many senses as possible.**
d) touch as much as possible.
2. Phonics is the application of _____ to the teaching of reading.
- a) morphology
b) phonology
c) syntax
d) whole language
3. The smallest unit of sound represented in print is a:
- a) morpheme
b) syllable
c) phoneme
d) grapheme
4. The smallest sound -bearing unit or a basic sound of speech is a;
- a) phoneme**
b) syllable
c) grapheme
d) morpheme
5. Phonemic awareness is the
- a) conscious awareness of orthography.
b) conscious awareness of morphemes.
c) **conscious awareness that words are made up of segments of sound** represented by letters.
d) conscious awareness of whole language.

References

- Adams, M. J. (2003). Alphabetic anxiety and explicit, systematic phonics instruction: A cognitive science perspective. In S. B. Neuman & D. K. Dickson (Eds.), *Handbook of early literacy research* (pp. 66-80). New York: The Guilford Press.
- Borko, H. (2004). Professional development and teacher learning; mapping the terrain. *Educational Researcher*, 33(8), 3-15.
- Bos, C., Mather, N., Dickson, S., Podhajski, B., & Chard, D. (2001). Perceptions and knowledge of pre-service and in-service educators about early reading instruction. *Annals of Dyslexia*, 51, 97-120.
- Caravolas, M., Kessler, B., Hulme, C., & Snowling, M. (2005). Effects of orthographic consistency, frequency, and letter knowledge of children's vowel spelling development. *Journal of Experimental Child Psychology*, 92, 307-321.
- Carroll, J., Gillon, G. T., & McNeill, B. C. (2013). Explicit phonological knowledge of educational professionals. *Asia Pacific Journal of Speech, Language and Hearing*, 15, 231-244.
- Cassar, M., Treiman, R., Moats, L., Cury Pollo, T., & Kessler, B. (2005). How do the spellings of children with dyslexia compare with those of non-dyslexic children? *Reading and Writing: An Interdisciplinary Journal*, 18, 27-49.
- Chall, J. S. (1967). *Learning to read: the great debate*. New York: McGraw- Hill.
- Chall, J. S. (1997). Are reading methods changing again. *Annals of Dyslexia*, 47, 257-264.
- Desimone, L. M., Porter, A. C., Garet, M. S., Yoon, K. S., Birman, B. F. (2002). Effects of professional development on teachers' instruction: results from a three-year longitudinal study. *Educational Evaluation and Policy Analysis*, 24(2), 81-112.
- Ehri, L. C. (1991). Learning to read and spell words. In L. Rieben & C. A. Perfetti (Eds.), *Learning to read: Basic research and its implications* (pp. 57-73). Hillsdale, NJ: Lawrence Erlbaum Associates.
- Ehri, L. C. (2002). Phases of acquisition in learning to read words and implications for teaching. *British Journal of Educational Psychology Monograph Series II*, 1, 7-28.
- Ehri, L. C. (2004). Teaching phonemic awareness and phonics. In P. McCardle, & V. Chhabra (Eds.), *The voice of evidence in reading research* (pp. 153-186). Baltimore, Md.: Brookes Publishing.
- Ehri, L. C. (2005). Learning to read words: Theory, findings and issues. *Scientific Studies of Reading*, 9(2), 167-188.
- Ehri, L. C., & Roberts, T. (2006). The roots of learning to read and write: Acquisition of letters and phonemic awareness. In D. K. Dickinson & S. B. Neuman (Eds.), *Handbook of early research* (Vol. 2, pp. 113-131). New York: The Guilford Press.
- Ehri, L. C., Nunes, S. R., Willows, D. M., Valeska Schuster, B., Yaghouh-Zadeh, Z., & Shanahan, T. (2001). Phonemic awareness instruction helps children learn to read: Evidence from the National Reading Panel's meta-analysis. *Reading Research Quarterly*, 36(3), 250-287.
- Ehri, L. C. (1992). Reconceptualizing the development of sight word reading and its relationship to recoding. In P. Gough, L. Ehri, & R. Treiman (Eds.), *Reading acquisition* (pp. 107-143). Hillsdale, NJ: Erlbaum.
- Eskey, D. E. (1992). Holding in the bottom: An interactive approach to the language problems of second language readers. In P. L. Carrell, J. Devine, & D. E. Eskey (Eds.), *Interactive approaches to second language reading* (4th ed., pp. 93-100). Cambridge: Cambridge University Press.
- Fielding-Barnsley, R. (2010). Australian pre-service teachers' knowledge of phonemic awareness and phonics in the process of learning to read. *Australian Journal of Learning Disabilities*, 15(1), 99-110.
- Garet, M. S., Porter, A. C., Desimone, L., Birman, B. F., Yoon, K. S. (2001). What makes professional development effective? Results from a national sample of teachers. *American Educational Research Journal*, 38(4), 915-945.
- Garet, M., Cronen, S., Eaton, M., Kurki, A., Ludwig, M., Jones, W., . . . Szejnberg, L. (2008). *The impact of two professional development interventions on early reading instruction and achievement* (NCEE 2008-4030). Washington, D.C.: National Center for Educational Evaluation and Regional Assistance, Institute of Education Sciences, U.S. Department of Education.
- Geva, E., & Siegel, L. S. (2000). Orthographic and cognitive factors in the concurrent development of basic reading skills in two languages. *Reading and Writing: An Interdisciplinary Journal*, 12(1-2), 1-30.

- Goldfus, C. (2012). Knowledge foundations for beginning reading teachers in EFL. *Annals of Dyslexia*, 62, 204-221.
- Guskey, T. R. (1986). Staff development and the process of teacher change. *Educational Researcher*, 15(5), 5-12.
- Ingvarson, L., Meiers, M., & Beavis, A. (2005). Factors affecting the impact of professional development programs on teaching knowledge, practice, student outcomes and efficacy. *Education Policy Analysis Archives*, 13(10). Retrieved from <http://files.eric.ed.gov/fulltext/EJ846522.pdf>
- Johnston, R. S., & Watson, J. (1997). Developing reading, spelling and phonemic awareness skills in primary school children. *Reading*, 31(2), 37-40.
- Joshi, R. M., & Carreker, S. (2009). Spelling: Development, assessment and instruction. In G. Reid (Ed.), *The Routledge companion to dyslexia* (pp. 113-125). Abingdon, Oxon: Routledge.
- Joshi, R. M., Binks, E., Hougen, M., Dahlgren, M. E., Ocker-Dean, E., & Smith, D. L. (2009). Why elementary teachers may be inadequately prepared to teach reading. *Journal of Learning Disabilities*, 42, 392-402.
- Joshi, R. M., Treiman, R., Carreker, S., & Moats, L. C. (2008-2009). How words cast their spell: Spelling is an integral part of the language, not a matter of memorization. *American Educator*, 42, 6-16.
- Kahn-Horwitz, J. (2015). 'Organizing the mess in my mind': EFL teachers' perceptions and knowledge of English orthography. *Reading and Writing: An Interdisciplinary Journal*, 28, 611-631.
- Kahn-Horwitz, J. (2016). Providing English foreign language teachers with content knowledge to facilitate decoding and spelling acquisition: A longitudinal perspective. *Annals of Dyslexia*, 66(1), 147-170.
- Lerner, J. (1989). *Learning disabilities: Theories, diagnosis and teaching strategies* (5th ed.). Boston: Houghton Mifflin Company.
- Lesaux, N. K., & Siegel, L. S. (2003). The development of reading in children who speak English as a second language. *Developmental Psychology*, 39(6), 1005-1019.
- Lieberman, I. Y., Shankweiler, D., Fischer, F. W., & Carter, B. (1974). Explicit syllable and phoneme segmentation in the young child. *Journal of Experimental Child Psychology*, 18, 201-212.
- Lundberg, I., Frost, J., & Peterson, O. (1988). Effects of an extensive program for stimulation phonological awareness in preschool children. *Reading Research Quarterly*, 23, 263-284.
- Manyak, P. C., & Bauer, E. B. (2008). Explicit code and comprehension instruction for English learners. *The Reading Teacher*, 6(5), 432-434.
- McNeill, B., & Kirk, C. (2014). Theoretical beliefs and instructional practices used for teaching spelling in elementary school. *Reading and Writing*, 27, 535-534.
- Medwell, J. (2002). *Primary English: Theory and practice* (2nd ed.). Exeter: Learning Matters.
- Mesmer, H. E., & Griffith, P. L. (2005). Everybody's selling it –But just what is explicit, systematic phonics instruction? *The Reading Teacher*, 59(4), 366-376.
- Moats, L. C. (1994). The Missing Foundation in Teacher Education: Knowledge of the structure of spoken and written language. *Annals of Dyslexia*, 44, 81-104.
- Moats, L. C. (2000). *Whole language lives on: the illusion of 'balanced' instruction*. Washington, D.C.: Thomas B. Fordham Foundation.
- Moats, L. C. (2014). What teachers don't know and why they aren't learning it: Addressing the need for content and pedagogy in teacher education. *Australian Journal of Learning Difficulties*, 19, 75-92.
- Moats, L. C., & Foorman, B. R. (2003). Measuring teachers' content knowledge of language and reading. *Annals of Dyslexia*, 53, 23-45.
- Moats, L. C., & Lyon, R. (1996). Wanted: Teachers with knowledge of language. *Topics of language disorders*, 16(2), 73-86.
- National Reading Panel (NRP). (2000). *Teaching children to read: An evidence-based assessment of the scientific research literature on reading and its implications for reading instruction* (Report of the subgroups). Washington, DC: U.S. Department of Health and Human Services, National Institutes of Health Development. Retrieved from <http://www.nicdh.nih.gov/publications/nrp/findings.htm>
- Phelps, G., & Schilling, S. (2004). Developing measures of content knowledge for teaching reading. *The Elementary School Journal*, 105(1), 31-48.
- Rayner, K., Foorman, B. R., Perfetti, C. A., Pesetsky, D., Seidenberg, M. S. (2001). How psychology science informs the teaching of reading. *Psychological Science in the Public Interest*, 2(2), 31-74.

- Share, D. L., & Stanovich, K. E. (1995). Cognitive processes in early reading development: Accommodating individual differences into a model of acquisition. *Issues in Education: Contributions from Educational Psychology, 1*, 1-57.
- Shulman, L. S. (1986). Those who understand: Knowledge growth in teaching. *Educational Researcher, 15*(2), 4-14.
- Shulman, L. S. (1987). Knowledge and teaching: Foundations of the new reform. *Harvard Educational Review, 5*(1), 1-22.
- Stanovich, K. E. (1985). Explaining the variance in reading ability in terms of psychological processes: What have we learned? *Annals of Dyslexia, 36*, 67-96.
- Stuart, M., Masterson, J. K., & Dixon, M. (2000). Spongelike acquisition of sight vocabulary in beginning readers. *Journal of Research in Reading, 23*, 12-27.
- Vaughn, S., Mathes, P., Linan-Thompson, S., & Francis, D. (2005). Teaching English language learners at risk for reading disabilities to read in English or Spanish: putting research into practice. *Learning Disabilities Research and Practice, 20*(1), 58-67.
- Ziegler, J. C., & Goswami, U. (2005). Reading acquisition, developmental dyslexia, and skilled reading across languages: A psycholinguistic grain size theory. *Psycholinguistics Bulletin, 131*(1), 3-29.

