

The Effect of a Suggested Multisensory Phonics Program on Developing Kindergarten Pre-service Teachers' EFL Reading Accuracy and Phonemic Awareness

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Abstract

The current study investigates the effect of a suggested Multisensory phonics program on developing kindergarten pre-service teachers' EFL reading accuracy and phonemic awareness. A total of 40 fourth year kindergarten pre-service teachers, Faculty of Education, participated in the study that involved one group experimental design. Pre-post tests were administered to assess the participants' phonics skills. The results showed that the suggested Multisensory Phonics program was effective in developing kindergarten pre-service teachers' EFL reading accuracy and phonemic awareness.

Keywords: multisensory phonics program, EFL reading accuracy, phonemic awareness, kindergarten pre-service teachers

1. Introduction

According to Campbell et al. (2014), one of the useful building blocks for successful EFL literacy instruction is to give explicit instruction in phonics. EFL learners need to build automaticity in bottom-up skills such as phonics to decode and spell words. The English language has 26 letters representing 44 sounds with more than 500 ways to spell them, so even native speakers of English receive instruction to handle decoding English. Kindergarten pre-service teachers have to be actively participating in reading activities. They feel they can take risks and experiments. Kindergarten stage represents the basis for teaching children how to make a correspondence between phonemes and graphemes. Therefore, many researchers support the view that phonics instruction is vital for kindergarten teachers as phonics knowledge is considered one of the key predictors of reading success (Campbell et al., 2014; Jamaludin et al., 2015; Phipps, 2011; Stuart, 1999).

As Phipps (2011) points out, synthetic phonics is a fast track multisensory approach to teach reading accuracy. It starts with the smallest units of speech—sounds and building up to bigger units by blending the small ones together. The basic skills in synthetic phonics are: learning the letter sound, letter formation, blending and segmenting skills. The learners are also taught tricky words that cannot be read by blending the sounds. They are sight words and are taught to the Kindergarten pre-service teachers as such.

Synthetic phonics has been found to be a fast and effective method for teaching reading accuracy (Deacon, 2012; Kolic-Vehovec, 2002; Malmeer & Araghi, 2013). As it is more fun and makes learners more engaged in language learning, learners are encouraged to read and write the letters in the air, on their hands, and on their partners' backs.

The awareness of a new method, in this case, the multisensory phonics method, evokes a series of responses in the pre-service teachers towards themselves, pupils, and the activity of teaching reading and writing. These responses positively influence teachers' skills and knowledge which, in turn, influence their attitudes and performance of the teaching task (Jamaludin et al., 2015).

1.1 Context of the Problem

The current study addresses the question of whether or not Kindergarten pre-service teachers benefit from a multisensory phonics program on the development of their phonemic awareness and reading accuracy. The problem of the current study is derived from the following resources:

First, as far as the researchers of the current study know, due to their work as members of EFL teaching staff, most kindergarten pre-service teachers' reading accuracy and phonemic awareness performance is poor as most of them do not follow the proper way of reading. Kindergarten pre-service teachers have difficulty discriminating English phonemes that do not already exist in their native language phonology (August et al., 2009; Escudero, 2014; Gilmore, 2011; Janzen, 2007; Yeung & Chan, 2012). For example, they do not always make the right predictions when reading is based on how they sound out a word, such as spelling "sed" instead of "said." According to Escudero (2014), kindergarten pre-service teachers have weaknesses in phonological skills and this affects their ability to decode with efficiency. They can often understand passages that are read to them but they lose the meaning of passages when they attempt to read them. Teachers who cannot adequately decode the words they encounter - short or long - face a formidable challenge.

Thus, a possible breakdown at the point of auditory discrimination is seen as placing EFL learners at a specific disadvantage for acquiring reading accuracy, particularly phonemic awareness and phonics in English (Invernizzi et al., 2015; Reading & Van Deuren, 2007; Rupley, 2009).

Second, research on language experiences and opportunities in kindergarten pre-service teacher education settings at the faculty of Education, Menoufia University has yielded disappointing discoveries. They don't have the chance to receive such training in using the synthetic phonics method during their preparation programs.

Third, a pilot study, conducted by the researchers, was an oral blending and segmenting assessment. 20 fourth year kindergarten pre-service teachers, enrolled in the kindergarten Department, Faculty of Education, Menoufia University, participated in the study. At the beginning, participants were informed about the aim of the pilot study. They were also assured that their answers are confidential and that data are used for research purposes only. The pilot study has revealed the following findings:

- EFL Kindergarten pre-service teachers have difficulty hearing and distinguishing between sounds in English.
- Sound/letter correspondence is not correct and therefore, leading to reading problems.
- Phonemic instability has been observed routinely among participants.

1.2 Questions of the Study

The current study attempts to answer the following main question:

What is the effect of using a suggested multisensory phonics program on developing kindergarten pre-service teachers' EFL reading accuracy and phonemic awareness?

Out of this main question, the following sub questions are stated:

- 1) What are the features of the suggested multisensory phonics program?
- 2) To what extent is the suggested multisensory phonics program effective in developing kindergarten pre-service teachers' EFL Phonemic awareness skills (Rhyme, Onset and rime, Blending, Segmenting)?
- 3) To what extent is the suggested multisensory phonics program effective in developing kindergarten pre-service teachers' EFL reading accuracy skills (Sight word efficiency, Decoding efficiency)?

1.3 Delimitations of the Study

The current study is confined to:

- 1) A sample of fourth year kindergarten pre-service teachers (n=40), Faculty of Education, Menoufia University.
- 2) The second semester of the 2014-2015 academic year.
- 3) The skills in the current study include: EFL reading accuracy (Sight word efficiency, phonetic decoding) and Phonemic awareness (Rhyme, onset and rime, blending, and segmenting).

1.4 Purpose of the Study

The current study aims at developing fourth year kindergarten pre-service teachers' EFL reading accuracy and phonemic awareness through using the suggested multisensory phonics program.

1.5 Significance of the Study

The current study is significant as it might help:

- Kindergarten pre-service teachers develop their reading accuracy and phonemic awareness in an attractive manner as the suggested program uses interesting stories, songs and pictures.
- Kindergarten instructors as the suggested program offers a new intervention and effective devices to assess teachers' phonemic performance.
- Faculty/ staff members as the suggested program provides a new strategy to train pre-service teachers know how to master phonics skills.

1.6 Hypotheses of the Study

The researchers have reached the following research hypotheses:

- 1). There would be a statistically significant difference between the mean scores of the pre-test and those of the post test of the study group on the overall reading accuracy and phonemic awareness in favour of the post test.
- 2). There would be a statistically significant difference between the mean scores of the pre-test and those of the post test of the study group on the phonemic awareness skills (Rhyme, Onset and rime, Blending, Segmenting) in favour of the post test.
- 3). There would be a statistically significant difference between the mean scores of the pre-test and those of the post test of the study group on the reading accuracy skills (Sight word efficiency, Decoding efficiency) in favour of the post test.

1.7 Terminology

1.7.1 Phonics Instruction

The current study views phonics instruction as the act of teaching the relationships between the letters (graphemes) of written language and the individual sounds (phonemes) of spoken language using visual, auditory, and kinesthetic modalities (Phipps, 2011).

1.7.2 Phonemic Awareness

Phonemic awareness is defined as the ability to determine and manipulate the sounds in the oral language. One can determine if pre-service teachers are proficient in phonemic awareness by determining whether he/she can rhyme words, blend phonemes or syllables to sound out a word, manipulate or delete phonemes at various positions in words, and decipher the new word (Carlson et al., 2013).

1.7.3 Reading Accuracy

Reading accuracy is the ability to decode words in a selection correctly (Allington et al., 2015; Morlini et al., 2015; Pasquarella et al., 2015; Taylor, 2013). The operational definition used in the current study refers to reading accuracy as the translation of printed words into a representation similar to oral language (Algozzine et al., 2008; Capraro, 2006; Carlson et al., 2013; HØIen-Tengesdal & TØNnessen, 2010; Hudson et al., 2011; Miller & Keenan, 2009; Padeliadu & Antoniou, 2013; Pikulski & Chard, 2005; Rautenberg, 2013; Suggate et al., 2014; Weiser, 2013).

2. Review of Literature

2.1 Literacy Development

According to August et al. (2014), literacy development is dependent on the larger social context through which there is a mutual contribution of all individuals to the knowledge system within a culture. Literacy practices are unique to specific cultures and even communities. Therefore, it is necessary that phonics intervention is based on a systems theory of literacy development. It occurs as a result of the interconnection and mutual reinforcement of cognition, language, motivation, and behaviour. According to Dickinson et al. (2006, p. 11), the domains of literacy, social and emotional development, and brain development "are shown to be interrelated, with synergistic interdependencies that result in increasingly well-orchestrated systems of related linguistic, cognitive, and affective/regulatory abilities". A cross-disciplinary approach takes into account the connection of all factors that relate to, support, and impact literacy development. Discussion of the systems theory of literacy development begins with an examination of the mutual development and reinforcement of oral language ability and code-related skills (Linebarger, 2001; Mendelsohn, 2002). To achieve literacy development, phonics training is of an utmost importance. Intervention is paramount in narrowing the literacy gaps included in kindergarten teachers' preparation programs as it becomes increasingly difficult for them to teach EFL to young kids after

graduation. Clear evidence has emerged with regard to the necessity of intervention with this population (Campbell et al., 2014; Driver et al., 2014; Janzen, 2007; Perez, 2010).

In order to narrow the gap in literacy achievement, it is vital that EFL quality opportunities are provided to kindergarten pre-service teachers. These opportunities can serve to equip them with essential skills and experiences necessary for successful literacy development. Kindergarten pre-service teachers need to have facility at processing speech sounds in order to acquire the oral language they are going to teach. Being unable to process the phonemic structures of the language, teachers experience difficulty in both the oral and written language domains of functioning.

Failure to develop essential reading accuracy will result in lower literacy abilities. Besides, discrepancies in literacy experiences will have a negative impact on other academic areas (August et al., 2014; Carson et al., 2015; Driver et al., 2014; Etmanskie et al., 2014; Hammond, 2015; Khonamri & Roostae, 2014; Kruse et al., 2015; Mena & Chapetón, 2014; Tsuji & Doherty, 2014).

2.2 Phonology of EFL Context

Phonology describes knowledge of the sound structure of a language. The acquisition of this knowledge enables Kindergarten pre-service teachers to attend to and distinguish between different speech sounds in his/her spoken language with precision and speed (Brownell & Leko, 2013; Hall, 2006; Hyun & Dan Marshall, 2003; Lloyd, 2007; Ukrainetz, 2009). Facility in this area of language processing contributes to the accurate reception and comprehension of oral language.

The relationship between speech perception and reading is seen as possibly focusing on a phonetic module which is responsible for the perception and production of the sound components in both the oral and written language (Scull et al., 2012). When the phonetic module is deficient, Kindergarten pre-service teachers will likely experience difficulty processing phonemes in the oral language which, in turn, impairs the process of learning phoneme-grapheme correspondences in the written language orthography (Okasha & Hamdi, 2014; Pinto et al., 2015; Rupley, 2009; Scully & Roberts, 2002; Tafa, 2008).

According to Landerl, 2000; Lane et al., 2002; Scott & Shearer-lingo, 2002; Scully & Roberts, 2002 and Stollar, 2002, there is a growing empirical evidence that phonemic awareness is a good predictor of word recognition skills in young Kindergarten pre-service teachers. For them, the acquisition of phonemic awareness may be influenced by the phonologic characteristics of their native language. Languages differ in the complexity of their phonemic structures. Variations occur at many levels ranging from the magnitude of syllable or the extent to which vowels or consonants harmonize (Papaja, 2013; Plaza, 2001; Puolakanaho et al., 2008; Reading & Van Deuren, 2007; Stuart, 2004). Interference between languages definitely leads to literacy problems. Phonics instruction appeared to be one of the major solutions of such problems.

2.3 How to Use Multisensory Programs to Teach Phonics

This section of the literature review begins with an overview of multisensory phonics instruction and its major components that have been found to contribute to literacy acquisition in learners. The review will then include an examination of the EFL literature in relation to phonics instruction.

The term phonics refers to the relationship between phonemes (smallest units of oral language) and graphemes (units of written language that represent phonemes) in reading and writing and a system of teaching reading that builds on the alphabetic principle (Zimmerman et al., 2008). It refers to the understanding that words are composed of letters (graphemes) that represent sounds (phonemes). The aim of phonics instruction is to enable Kindergarten pre-service teachers absorb the alphabetic principle (Campbell et al., 2014). A key aspect of a systematic phonics program is a focus on the teaching of a pre-specified array of letter-sound correspondences and practice in applying this knowledge to reading and writing activities (Zimmerman et al., 2008). Instruction can be implemented in several formats ranging from direct, systematic teaching supported by reading material (e.g., worksheets, planned activities) to more indirect approaches where symbol-sound units are taught through the analysis of complete words. Although several types of phonics programs exist, evidence points to the greatest benefits of systematic sequential phonics approaches (Nishanimut et al., 2013; Rupley, 2009). One of the programs that follow a systematic sequential phonics approach is Jolly Phonics. It is a program developed by Lloyd (1993) where phoneme-grapheme correspondences are introduced in a specific order. Letter-sound relationships are introduced through short stories where emphasis is placed on eliciting the appropriate sound coupled with an accompanying physical action (Lloyd, 2007). The program includes various activities to practice and consolidate the letter(s)/sound connections (Callinan & Zee, 2010).

2.3.1 Synthetic Phonics Instruction

Synthetic phonics instruction involves the synthesis of phonemes into whole spoken words (Brooks, 1999). It involves the systematic presentation and teaching of specific sets of letter groups prior to an introduction of books or whole words. The groups of letters and their corresponding sounds are specifically selected because together they form a large number of three-letter regular words. The use of magnetic letters or letter cards to blend spoken words together is quite common in synthetic phonics programs. Research supports the argument that synthetic phonics interventions can have a significant impact on EFL reading accuracy and phonemic awareness (Campbell et al., 2014; Jamaludin et al., 2015; Phipps, 2011; Rupley, 2009; Stuart, 1999).

2.3.2 Explicit Systematic Phonics Instruction

The teaching of phonics has become one of the most important areas in literacy development (Jamaludin et al., 2015; Rupley, 2009). There are many approaches to teaching phonics including explicit, synthetic, analytic and embedded ways. However, all approaches focus on teaching the relationship between phonemes and graphemes (Driver et al., 2014; Phipps, 2011; Weiser, 2013). Systematic explicit instruction is a term commonly associated with phonics (Campbell et al., 2011). The words “systematic” and “explicit” are often used together although they are not synonymous. The term “explicit” refers to the way phonics lessons are delivered. Explicit is a feature of a teaching strategy where an educator tells Kindergarten pre-service teachers directly what they are trying to teach. The term “systematic” refers to curricular format. It is the orderly progression of phoneme-grapheme instruction (Puolakanaho et al., 2008; Zeece, 2006). Common elements of explicit and systematic phonics instruction include ‘a curriculum with a specific, sequential set of phonics elements’ and ‘instruction that is direct, precise, and unambiguous’ (Mesmer & Griffith, 2005, p. 369). Explicit and systematic phonemic awareness instruction is crucial to the development of successful readers and should be a priority in reading education. Researchers and educators in different countries around the world infuse this understanding of phonemic awareness (PA) into reading programs and other curricula that are variably highly prescribed (Lane, 2007; Brownell et al., 2011; Brownell & Leko, 2013; Leko & Brownell, 2011).

Therefore, phonics training plays a key role in improving how educators acquire and master evidence-based reading instruction. Undergraduates benefit from such training as they acquire necessary knowledge and skills that underwrite advanced practices for teaching phonics (Landerl, 2000; Scully & Roberts, 2002).

Educators can explicitly teach phonics through play based meaningful experiences by linking phoneme-grapheme instruction directly to picture books, during shared reading, through rhymes and dramatic play (Casalis & Cole, 2009; Escudero, 2014; Jamaludin et al., 2015; McCarthy, 2008; Mena & Chapetón, 2014; Perez, 2010; Phipps, 2011; Plaza, 2001). Phonics instruction uses stories and actions to support the learning of the letter sounds. Such materials add much fun and also make remembering the sounds easier for the learners (Campbell et al., 2014; Jamaludin et al., 2015; Phipps, 2011).

2.3.3 Modelling Followed by Independent Practice

As the connection between letters and sounds is not readily apparent to new readers, modelling is an important aspect of phonics instruction. According to Escudero (2014), teachers should model ways that a reader uses the sound-symbol relationship to decode unfamiliar words by reading and thinking aloud. The texts for modelling could include rhymes, songs, non-fiction books and poems with repetitive language.

Once kindergarten teachers have been exposed to modelling several times, they should be encouraged to practice applying phonics to their own reading. This independent practice helps them truly build the connection between symbols and sounds. Phonemic awareness and reading accuracy are the main skills which Kindergarten pre-service teachers should be trained to master.

2.4 Phonemic Awareness (PA)

The ability to manipulate phonemes in spoken words such as syllables and rhyming words is an essential characteristic of phonemic awareness (McCarthy, 2008; Phillips & Torgesen, 2006; Ukrainetz, 2009; Zeece, 2006). An understanding of phonics enables learners to use alphabetic code breaking skills to decode written words (Ehri & Nunes, 2002; Zimmerman et al., 2008). In learning to read words, students need to decode by transforming graphemes into a blend of phonemes (Ehri et al., 2001; Landerl, 2000; McGee & Ukrainetz, 2009; Scully & Roberts, 2002).

Developing (PA) is essential for learning to read. A student with a strong (PA) has foundational tools that are necessary for the accurate decoding of words and later, comprehension of text (Stollar, 2002). These critical tools include the ability to rapidly associate phonemes with their appropriate sounds, segment and blend sounds within words (Scott & Shearer-lingo, 2002). Blending is the skill required for reading. Learners are taught how to blend

the individual printed or written sounds. When they do so, they are able to read words and later, sentences. Segmenting skills enable learners to write spoken words. It is the skill they require to succeed in reading. The learners are taught how to identify sounds in words and to know the positions of sounds in words (Abu-Leil et al., 2014; Mishra, 2013; Puolakanaho et al., 2008).

According to Carlson et al. (2013), phonemic awareness refers to the understanding of various ways oral language can be broken down into smaller components and manipulated with an understanding of how language is constructed and used. Kruse et al. (2015), assure that phonemic awareness is exhibited when Kindergarten pre-service teachers demonstrate appreciation of rhymes and alliteration. The most sophisticated level of phonemic awareness involves the understanding that words are made up of individual sounds and the ability to manipulate these sounds through segmenting, blending or changing the phonemes in words or to create new words. The development of phonemic awareness is both a cause and a consequence of learning to read. The development of basic levels of phonemic awareness supports reading and as reading ability increases, learners develop more sophisticated levels of phonemic awareness (AlShaiji & AlSaleem, 2014; Atkins, 2014; Carlson et al., 2013; Deacon, 2012; Gunning, 2009; Papaja, 2013; Tafa, 2008).

Kindergarten pre-service teachers with limited vocabularies will likely be limited in phonemic awareness because they have not experienced lexical restructuring which would allow for segmentation of words. Therefore, the emergence of phonemic awareness is dependent on lexical restructuring. The relationship between oral language and phonemic awareness was considered bi-directional. There is now some evidence to suggest a causal relationship between oral language and phonemic awareness (Lefebvre et al., 2011; Malmeeer & Araghi, 2013; McCollin et al., 2009; Plaza, 2001; Spooner et al., 2004; Stuart, 2004; Suggate et al., 2014; Tafa, 2008; Weiser, 2013).

2.4.1 Ways to Measure Phonemic Awareness

Phonemic awareness can be measured through a variety of different tasks, with the most important distinction among them being whether they assess analytic or synthetic skills. Phonemic analysis involves the ability to isolate individual phonemes within words (Yeung & Chan, 2012). In contrast, phonemic synthesis is the ability to combine a sequence of isolated phonemes together in order to produce a recognizable word or even a non-word (Saiegh-Haddad, 2007).

Phonemic awareness tasks also vary in difficulty with the full range of phonemic abilities extending from the ability to identify rhymes up through the ability to manipulate individual phonemes within a word. Tasks commonly used to measure phonemic analysis include:

- a) Recognition and production of rhymes,
- b) Multiple choice tasks that require Kindergarten pre-service teachers to choose a word (pictured) that has the same first, middle, or last sound as other pictured words,
- c) Elision tasks that require EFL learners to pronounce a word after deleting a specific phoneme (Say, "bat" without the "b" sound),
- d) Measures that require Kindergarten pre-service teachers to separately pronounce the phonemes of words,
- e) Phoneme reversal tasks that require Kindergarten pre-service teachers to reverse the sounds in words (i.e. "which word do you have if you say 'pat' backwards?") (Kruse et al., 2015; Noe et al., 2013).

Synthesis tasks can vary in difficulty from multiple choice tasks that require the Kindergarten pre-service teachers to select which of two or more words was pronounced as onset and rhyme to similar tasks that require learners to select which of two or more words was pronounced phoneme by phoneme, and ultimately to tasks that require Kindergarten pre-service teachers to say aloud a string of separately presented phonemes together to produce a word or non-word. This general set of tasks has been employed in a variety of studies to assess learners' phonemic awareness.

2.5 Reading Accuracy

Reading ability is composed of two major parts: language comprehension (i.e., oral language proficiency) and decoding (i.e., word identification). Language comprehension is conceptualized to as the process by which the meanings of decoded words can be subsequently integrated into meaningful sentences and text structures. Decoding is the result of the application of word identification skills that is word analysis based on phonemic awareness and knowledge of grapheme-phoneme correspondences as well as the rapid retrieval of sight words from the lexicon (Turkan et al., 2012).

Reading is a complex task consisting of multiple component skills. A deficiency in any area may impact reading

performance (Woolley, 2011). Comprehension is the process of constructing meaning from text by simultaneously extracting and constructing meaning through interaction and involvement with written language (Landerl, 2000; Lloyd, 2007; Stollar, 2002; Zimmerman et al., 2008). Constructing meaning from written language requires making a connection to oral language (Capraro, 2006; Padeliadu & Antoniou, 2013). A printed word must be connected to an individual's phonological memory for the word and be connected to the meaning of the word or it cannot be accurately decoded or understood (Pikulski & Chard, 2005). Reading the words at an adequate rate is highly related to comprehension. Therefore, it is important to help kindergarten pre-service teachers who are still lacking decoding skills to receive instruction to improve reading skills.

2.5.1 Letter Knowledge

Letter knowledge is a basic cornerstone of Kindergarten pre-service teachers' literacy acquisition. They must be able to identify, discriminate similar looking letters, and name each letter in the alphabet in order to make meaningful associations between letter symbols and their corresponding sound representations (Carson et al., 2015; Jamaludin et al., 2015; Pinto et al., 2015). Knowledge of the alphabetic principle refers to a realization that, in alphabetic orthographies, spoken words are comprised of phonemes and the phonemes are represented in text as letters (August et al., 2009; Gunning, 2009).

The development of effective intervention methods for improving reading skills has to focus on several aspects of such instruction. It includes comparing practice with words in isolation to practice with words in context and the importance of familiarity with within-word patterns (Cassidy & Cassidy, 2004). Researchers (Benjamin & Schwanenflugel, 2010; Benjamin et al., 2013; Lai et al., 2014) assure that phonemic awareness, decoding, and accuracy are essential for reading with understanding.

Reading Accuracy is the ability to read connected text accurately, automatically, and with proper expression. There is a strong evidence that improving phonemic awareness, knowledge of letter-sound correspondences, and decoding skills improve reading accuracy (Good et al., 2014; Invernizzi et al., 2015; Jamaludin et al., 2015; Khonamri & Roostae, 2014; Lai et al., 2014; Suggate et al., 2014).

2.5.2 Decoding

It is the practice of using various reading skills to read or "decode" words. In decoding, readers sound out words by pronouncing their parts and then joining those parts to form words (HØien-Tengesdal & TØNnessen, 2010; Hudson et al., 2011; Pikulski & Chard, 2005; Suggate et al., 2014). To comprehend what is being read, readers must be able to decode words and join the parts quickly and accurately.

Readers who do not develop decoding skills will also have difficulty with reading comprehension. The earliest phases of decoding instruction usually involve phonemic awareness and phonics instruction (Capraro, 2006; Talcott et al., 2000). Kindergarten pre-service teachers learn how to sound out the various sounds in words and combine them to make words up to one syllable. They also work with both long and short vowel sounds. As they progress, they learn to decode more increasingly complex words with more than one syllable. Once Kindergarten pre-service teachers become proficient with these skills, they no longer feel the need to sound out each letter to decode words and they begin to rely more on sight recognition.

Decoding Skills include the ability to recognize the basic sounds and phonemes that make up a word, know what it means, recognize it in context and know whether or not it is being used correctly in a sentence (Miller & Keenan, 2009). As most learners master decoding skills, they naturally begin to become more efficient readers. Learning to recognize whole words by sight rather than by decoding each word is part of that process. Naturally, reading a whole word by sight rather than decoding letter-by-letter and sound-by-sound is a much more efficient and faster process (Mishra, 2013). However, improving learners' ability to recognize sight word will likely help them with overall reading speed and accuracy as well as comprehension (Phillips & Feng, 2012). When readers learn to recognize words by sight, it increases their overall reading comprehension and helps them understand other words in the context of sentences (McArthur et al., 2015).

Decoding skills are essential for learning to read and developing fluency when reading. These skills include recognizing the basic sounds and sound blends within a word, understanding the meaning of the word, knowing what role the word plays in the sentence, both grammatically and contextually, and how the word is changed by adding prefixes or suffixes. In other words, decoding skills are those necessary to interpret and analyze words while reading.

3. Methodology

3.1 Design of the Study

The current study is a pre-post-test quasi experimental one. The study group was tested before conducting the treatment. During experimentation, the study group was taught using the multisensory phonics program. At the end of treatment, participants were post-tested.

3.2 Variables of the Study

The independent variable of this study is the multisensory phonics program while the dependent variable is represented in kindergarten pre-service teachers' EFL reading accuracy and phonemic awareness.

3.3 Participants of the Study

The participants of the current study are 40 fourth year kindergarten pre-service teachers, Faculty of Education, Menoufia University. Participants have studied three EFL courses (The Main Principles of the English Language) in three different semesters; consequently, they are supposed to master the basic reading accuracy and phonemic awareness skills.

3.4 Procedures of the Study

- Reviewing literature and previous studies related to EFL reading accuracy and phonemic awareness, multisensory phonics training as an intervention and a training tool.
- Selecting participants of the study from 4th year kindergarten pre-service teachers.
- Preparing the study instruments and materials which included:
 - Two equivalent versions of the EFL reading accuracy test to be used as a pre- post-test.
 - Two equivalent versions of the EFL phonics awareness test to be used as a pre- post-test.
 - A teacher's guide for implementing the multisensory phonics program.
 - The suggested multisensory phonics program.
- Validating the study instruments and materials by submitting them to a panel of jurors in the field of linguistics and teaching English as a foreign language.
- Piloting the study instruments and materials.
- Pre-testing the study group.
- Conducting the treatment in which participants were taught using the multisensory phonics program.
- Post-testing the study group.
- Analyzing data statistically and interpreting the results.
- Providing recommendations and suggestions for further research.

3.5 Study Instruments

3.5.1 Phonemic Awareness Skills Test (Appendix 1)

3.5.1.1 Test Description

The Phonemic Awareness Skills Test is designed, by the researchers, to determine each participant's level of phonemic awareness across a variety of test items. It is used as a pre-post-test to find out the effectiveness of the suggested multisensory program. The test consists of questions that measured the participants' skills of rhyme supply, onset and rime, segmentation and blending.

3.5.1.2 Test Validity

The Phonemic Awareness Skills Test was given to a panel of jury in the field of linguistics and teaching English as a foreign language to judge its validity. The jury agreed that the test properly measures the aim of using it.

3.5.1.3 Test Reliability

Test re-test method was used to determine the reliability of the test. The correlation coefficient was 0.85 which is highly reliable.

3.5.2 Reading Accuracy Test (Appendix 2)

3.5.2.1 Test Description

The reading accuracy test is designed, by the researchers, to evaluate the participant's level of both decoding and

sight word efficiencies. The decoding efficiency test begins with the presentation of a stimulus paper containing some consonant and vowel phoneme sample words arranged in ascending order of complexity. The pre-service teachers are asked to read the stimulus words in sequence. One point was awarded for each correct response.

Sight word assessment on this subtest was measured in terms of Kindergarten pre-service teachers' ability to read as many correct words as they can. Each participant was asked to read a passage for the level the researchers are assessing. The text was selected from their second term English course to measure their reading accuracy. The text was used instead of a word list as meaningful context influences reading accuracy, especially in poor readers (Good et al., 2014; Gray, 2014; B. Phillips & Torgesen, 2006). Besides, by using the same text for all kindergarten pre-service teachers, the reading situation was standardized and all participants read the same number of words.

The correct words are highlighted and the words that are incorrect are circled. The number of correct words is counted out of total 40 words and percentage is calculated.

3.5.2.2 Test Validity

The Reading accuracy test was given to a panel of jury in the field of teaching English as a foreign language to judge its validity. Two words were replaced by others because of their ambiguity.

3.5.2.3 Test Reliability

The split-half method was used to determine the reliability of the test. The correlation coefficient was 0.78 which is highly reliable.

3.6 Material of the study

3.6.1 The Multisensory Phonics Program

3.6.1.1 The Objectives of the Multisensory Phonics Program

By the end of the program, participants are expected to develop:

A) EFL reading accuracy skills

- Sight word efficiency.
- Decoding efficiency.

B) Phonemic awareness skills

- Rhyme.
- Onset and rime.
- Blending.
- Segmenting.

3.6.1.2 Description of the Multisensory Phonics Program

It is a program that teaches the basic components of the English language, the sounds and letters, and integrates the technique of putting these sounds together and taking them apart. This intervention advocates that kindergarten pre-service teachers learn the alphabet and phonetic synthesis of words. The Phonics multisensory program associates the visual, auditory, and kinaesthetic language simultaneously. When reading, participants trace the letter as they see it and say the name of the letter and sound. They blend the letters, read words, sentences, and controlled vocabulary stories. Spelling is also implemented.

The program includes 5 main components skills:

- (1) Teaching the letter sounds,
- (2) Teaching letter formation,
- (3) Blending letter-sounds for reading,
- (4) Identifying sounds for writing, and
- (5) Spelling the tricky words.

The program is synthetic in approach in that Kindergarten pre-service teachers are given opportunities to practice the prearranged array of phoneme-grapheme correspondences through reading (blending letter-sounds) and spelling (identifying sounds in words) regular real words derived from the letter-sound correspondences taught.

3.6.1.3 Duration of the Program

The training lasted for 3 months during which the kindergarten pre-service teachers learnt the letter sound correspondences and the basic skills in using multisensory phonics. Pre-testing occurred one week prior to the intervention. Post-testing was conducted during a two week period following the interventions. Pre-post-testing was conducted by the researchers. Two different assessments were selected that measured phonemic awareness and reading accuracy.

3.6.1.4 Implementation of the Program

3.6.1.4.1 The Orientation Session

The aim of this session is to prepare kindergarten pre-service teachers for the intervention. The researchers have conducted the following steps:

- Explaining the importance and the aims of the suggested multisensory phonics program.
- Identifying what's meant by multisensory phonics, EFL phonemic awareness and reading accuracy.
- Clarifying how to associate sounds with letters and connect them with the oral language and how to decode words as the first step leading to reading accurately.
- Training participants to use their senses during the application of the suggested multisensory program. They were trained to use all their senses by singing, dancing, and acting, making shapes on the air, looking at pictures, playing games and making sounds.

3.6.1.4.2 Experimentation

Participants of the study were trained to master the following skills:

- 1) Sound production
- 2) Sound discrimination
- 3) Sound Categorization
- 4) Letter identification
- 5) Letter formation

Participants were also taught many games which would make the teaching/learning enjoyable for kindergarten kids. The training is expected to result in a change in the methods they previously used while preparing their lessons and in their teaching of reading and writing skills. Participants were trained to use the following activities:

Sound production (phonemic awareness activity)

During each instructional session in which a new letter was introduced, kindergarten pre-service teachers were asked to repeat a sound articulated by the researcher. After repeating the articulation of the sound, participants are asked to focus on specific physical aspects of sound generation, such as which parts of their mouth, lips, tongue, and teeth are helping to make that sound. Participants are also asked to focus on how the movement of air through their noses and mouths as well as vocal cord movement assist in the generation of specific sounds.

Sound discrimination (phonemic awareness activity)

During lessons in which a new letter/sound was introduced, participants were presented with mixed pictures. Some of the cards contained pictures started with the target sound and some of the cards did not. Participants had to discriminate between the target sound and the non-target ones. When they disagreed on a given card, they were guided to use slow articulation in order to confirm the appropriate identification of target sounds.

Sound Categorization (phonemic awareness activity)

During review lessons, kindergarten pre-service teachers played various games which required them to categorize picture cards according to the appropriate letter. The groups of letters used in these review games were based on linguistic categorization. For example, if the letters c/k, r, p, m, n were being reviewed, pictures containing these letters would be placed on the white board using the power point program. Kindergarten pre-service teachers were then given 3-4 picture cards each that contained the initial sound of one of the letters being reviewed. After placing the picture card under a given letter, participants were prompted to articulate the first sound of the picture and then decide if the correct choice was made.

Letter identification and formation (Reading Accuracy activity)

Letters were introduced according to the schedule presented in Appendix 2. Participants were provided embossed letter cards (capital and lower case) which they traced with their fingers on the air or on their peers' back in order

to provide tactile experience with letter formation. Participants said the letter name one time as they were tracing.

Word Lists (Reading Accuracy activity)

After introduction of a given sound, participants were prompted to provide words that contained that sound. Student-generated word lists were written by the researchers. The word lists were recorded for reference during review lessons. Words were added to the list during review activities if participants offered a word not previously recorded from that group of kindergarten pre-service teachers.

Writing

Participants were provided with their own journals to briefly practice letter formation skills. They were also given the opportunity to write a word of their choice from the student generated word list. Writing was only practiced on days when new letters were introduced. The inclusion of a letter formation component serves to reinforce tactile encoding as well as providing initial experience with writing letters.

4. Results

SPSS (Statistical Package for the Social Sciences, version16) was used to analyze participants' scores on the pre and post-tests. Results are shown in the light of the study hypotheses and questions.

4.1 Results Related to the First Hypothesis of the Study

Hypothesis One: There would be a statistically significant difference between the mean scores of the pre-test and those of the post test of the study group on the overall phonemic awareness and reading accuracy in favour of the post test. In order to investigate this hypothesis, t-test was used to identify the significance of difference between the mean score of the study group on both the pre and post-test. Table 1 shows the t-value of the difference between the pre and post-test.

Table 1. The significance of difference between the mean score of the study group on the pre-post-test regarding the overall phonemic awareness and reading accuracy

Skill	Type of test	N	Mean	Std. Deviation	t-value	df	Sig
Overall phonemic awareness	Pre	40	11.90	1.411	38.801	39	Significant
	Post	40	24.75	1.391			
Overall reading accuracy	Pre	40	33.75	2.193	50.79	39	Significant
	Post	40	65.62	2.559			

As Table 1 shows, there existed a significant difference between the mean score of the pre –post test of the study group regarding the overall phonemic awareness in favour of the post-test ($t= 38.80$, $p> 0.01$).

Table 1 also shows that the mean score of the overall reading accuracy pre-test is 33.75 and the SD is 2.193, while the mean score of the post test is 65.62 and the SD is 2.559. As Table 1 shows, there existed a significant difference between the mean scores of the overall pre -post test of the study group in favour of the post-test ($t= 50.97$, $p> 0.01$).

Thus, the first hypothesis is accepted. This table is represented graphically in the following figure:

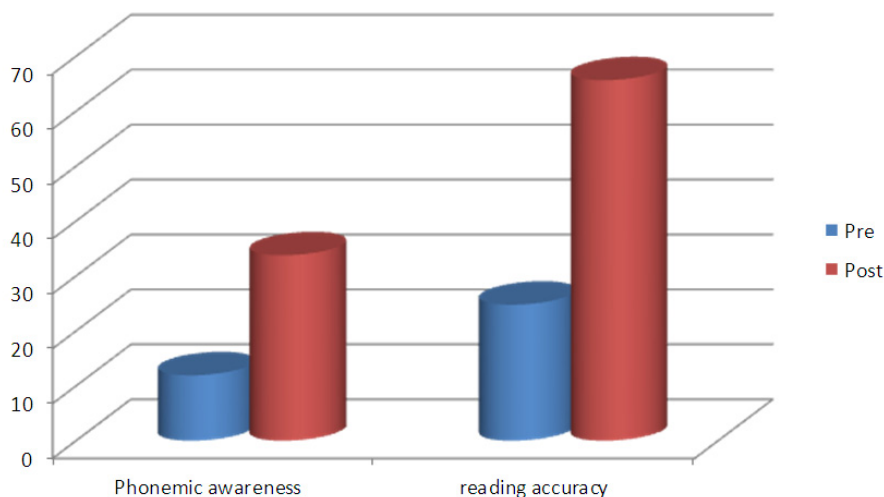


Figure 1. Results of the overall phonemic awareness and reading accuracy skills

4. 2 Results Related to the Second Hypothesis of the Study

Hypothesis Two: There would be a statistically significant difference between the mean scores of the pre-test and those of the post test of the study group on the skills of phonemic awareness in favour of the post test. In order to investigate this hypothesis, t-test was used to compare the mean score of the study group on both the pre and post-test on the phonemic awareness skills. Table 2 shows the t-values of the difference between the pre and post-test.

Table 2. The significance of differences between the mean scores of the study group on the pre-post-test regarding the EFL phonemic awareness skills

Skills	Type of test	N	Mean	Std. Deviation	t-value	df	Sig
Phonemic awareness	Pre	40	11.90	1.411	38.801	39	Significant
	Post	40	24.75	1.391			
Rhyme supply	Pre	40	3.10	.709	18.535	39	Significant
	Post	40	6.28	.847			
Onset and rime	Pre	40	3.02	.768	16.431	39	Significant
	Post	40	6.30	.883			
Blending	Pre	40	2.85	.662	19.626	39	Significant
	Post	40	6.18	.903			
Segmenting	Pre	40	2.85	.662	12.609	39	Significant
	Post	40	5.92	1.309			

As Table 2 shows, there existed a significant difference between the mean score of the pre –post-test in favour of the latter ($t=38.801$, $p > 0.01$). Thus, the second hypothesis is accepted. To determine whether the multisensory phonics program is educationally and practically effective in developing kindergarten pre-service teachers' phonemic awareness, the effect size was calculated using η^2 . $\eta^2 = t^2 / (t^2 + df)$ where (t) is the (t) value of the overall sum and (df) is the degrees of freedom. The effect size was (%90) which is higher than the large effect size value (%15). This reflects that the multisensory phonics program is effective in developing kindergarten pre-service teachers' EFL phonemic awareness skills. The previous table is represented graphically in the following figure:

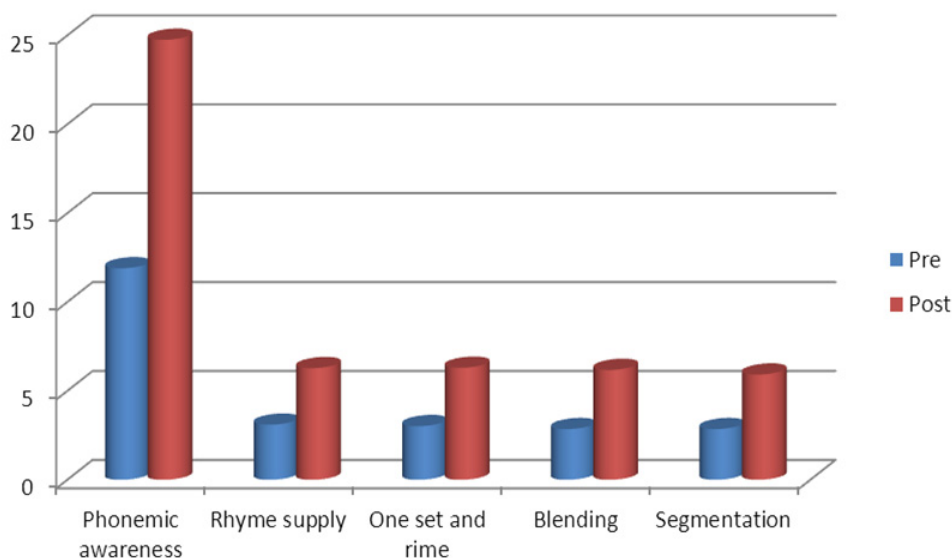


Figure 2. Results of the phonemic awareness skills

4.3 Results Related to the Third Hypothesis of the Study

Hypothesis Three: There would be a statistically significant difference between the mean scores of the pre-test and those of the post test of the study group on the reading accuracy test in favour of the post test. In order to investigate this hypothesis, the t-test was used to compare the mean score of the study group on both the pre-post-test in reading accuracy skills. Table 3 shows the t-values of the difference between the pre-post tests.

Table 3. The significance of differences between the mean scores of the study group on the pre-post-test regarding EFL reading accuracy skills

Skills	Type of test	N	Mean	Std. Deviation	t-value	df	Sig
Reading accuracy	Pre	40	33.75	2.193	50.792	39	Significant
	Post	40	65.62	2.559			
Decoding efficiency	Pre	40	19.55	4.236	12.794	39	Significant
	Post	40	32.65	3.669			
Sight word	Pre	40	14.20	2.812	30.350	39	Significant
	Post	40	32.98	2.190			

As Table3 shows, there existed a significant difference between the mean score of the pre-post-test in favour of the latter ($t=50.79$, $p> 0.01$). Thus, the third hypothesis is accepted. To determine whether the multisensory phonics program is educationally and practically effective in developing kindergarten pre-service teachers' reading accuracy skills, the effect size was calculated using η^2 . $\eta^2 = t^2 / (t^2 + df)$ where (t) is the (t) value of the overall sum and (df) is the degrees of freedom. The effect size was (%89) which is higher than the large effect size value (%15). This reflects that the multisensory phonics program is effective in developing the kindergarten pre-service teachers ' reading accuracy skills as shown in Table 3. It is represented graphically in the following figure:

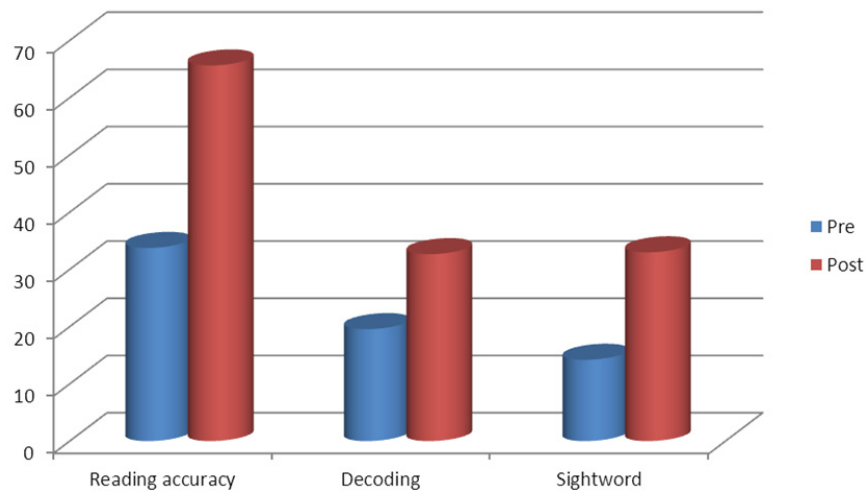


Figure 3. Results of the reading accuracy skills

5. Discussion

5.1 Impact of the Multisensory Phonics Program on Phonemic Awareness and Reading Accuracy

Consistent with other research findings involving EFL learners, results of this study demonstrated that the suggested Multisensory phonics program is an effective means of teaching Kindergarten pre-service teachers some of the key foundational skills found to be important for their reading success in English. With respect to the phonemic awareness, multisensory phonics program appears to have a significant impact. On measures of reading accuracy (i.e., decoding and sight word), there is a strong empirical evidence suggesting that Multisensory phonics instruction contributes to the development of participants' word identification and decoding skills. Kindergarten pre-service teachers who received Multisensory Phonics instruction significantly and consistently performed on measures of word decoding and sight word skills. These results indicate that Multisensory Phonics is an effective means of teaching Kindergarten pre-service teachers how to read words accurately during their teaching and learning experience.

These findings might be due to the following:

- 1) The nature of the Multisensory Phonics program which includes supplementary word building activities focused on the generation of rhyming word families, segmenting and blending. These activities may have helped Kindergarten pre-service teachers acquire EFL phonemic awareness.
- 2) The multisensory phonics program provides kindergarten pre-service teachers with the skills needed for generating new words from a known word and thus develops phonemic awareness through improving kindergarten pre-service teacher's abilities to generate a similar "rhyming" word that rhymes with an auditory prompt.
- 3) The phonics program also provides kindergarten pre-service teachers with the skills needed for combining onsets and rimes to form words. In addition, it develops their awareness of phoneme patterns which reoccur in words and how to isolate the onset.
- 4) Phonemic knowledge, a key instructional component of the Multisensory Phonics program, contributes to provide Kindergarten pre-service teachers with a visual referent form which facilitates the manipulation of individual sounds and letters within words.
- 5). Awareness of individual phonemes and ways to create word patterns with phonemes was emphasized in the suggested program. Kindergarten pre-service teachers become aware of the individual sounds that make up words. They recognize and connect letters with the initial consonant sounds of a word first. Then, they become aware of the ending consonant sounds in the word.
- 6). The suggested program concentrates on developing the Kindergarten pre-service teachers' ability to segment the individual phonemes in spoken words. Besides, the ability to blend individual phonemes into whole spoken words was largely attributed to their exposure to Multisensory Phonics instruction.

- 7). The attractive nature of the suggested program as it trains the participants through interesting activities.
- 8). The cooperative work created an enthusiastic environment that encouraged participants to be active and help each other with the program.

6. Conclusion

The purpose of the present study is to investigate the degree to which Kindergarten pre-service teachers benefit from a Multisensory phonics program in developing phonemic awareness and reading accuracy. The program was applied to a sample of 40 fourth year Kindergarten pre-service teachers in the faculty of Education, Menoufia University. Findings showed that the multisensory phonics program was effective in developing the participants' phonemic awareness and reading accuracy. This study confirms what has been demonstrated by others (Callinan & Zee, 2010; Jamaludin et al., 2015; Phipps, 2011; Rupley, 2009; Zimmerman et al., 2008) that using Phonics programs is an effective means of developing EFL phonemic awareness and accuracy skills of Kindergarten pre-service teachers. Moreover, the current study proved the effectiveness of the multi-sensory approach in developing Kindergarten pre-service teachers' phonics skills.

7. Recommendations for Further Research

Based on the results of the current study, the following recommendations are stated:

- 1) Multi-sensory approach should be emphasized in teaching and learning different features of the English language. It includes the use of various activities directed to the students' senses (gates of knowledge). It makes it easy for them to absorb knowledge and develop skills.
- 2) Future research is needed to determine if other programs are as effective as the Multisensory Phonics program in helping Kindergarten pre-service teachers acquire some of the key foundation skills necessary for their reading success.
- 3) Multisensory Phonics programs are also needed to be used with preparatory and secondary stage teachers. Multisensory Phonics is an engaging and developmentally appropriate program that is relevant at all stages.

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