Learning Disabilities: A Contemporary Journal 7(1), 1–20, 2009

A Multisensory Approach to Teach Arabic Decoding to Students with Dyslexia

Katia H. Hazoury
Ahmad A. Oweini[1]
Rima Bahous
Lebanese American University

This paper proposes a technique for teaching decoding of the Arabic language to Arab dyslexic students following the multisensory, systematic, explicit phonics approach and based in part on the Orton-Gillingham approach. This technique emphasizes vocabulary controlled, font-modified, cumulative, color-coded reading materials, and orthographic rather than linguistic patterns. A comprehensive theoretical framework and a detailed development of the multisensory lessons are provided, and a sample lesson is included. This method needs to be tested empirically to measure its effectiveness. Supplementary activities are recommended to maximize its benefits.

Teaching decoding in Arabic to students with dyslexia is a unique challenge in Lebanon and the Arab World because no known reading remedial programs have been developed. Three characteristics undermine the effectiveness of currently used school reading programs and limit their use as remedial programs for dyslexic students. They do not follow a systematic approach, are not vocabulary controlled and lack visual aids such as sound cards, plastic letters and tactile materials, thereby making multisensory teaching virtually impossible. An informal survey with ten special educators working with dyslexic students concluded that teachers are left to their creativity and resourcefulness to fill these gaps, and often reach an impasse with dyslexic students.

This paper proposes an innovative Arabic technique that teaches decoding to dyslexic students using a research-based systematic multisensory approach, derived from research-based reading strategies developed in the US on the English language, and taking into consideration the unique features of Arabic language and Arabic dyslexia.

Dyslexia

Dyslexia and reading difficulty are two terms that have long been related. Reading difficulty impedes the use of the products and principles of the writing system in order to get the meaning of a written text (Snow, Burns, & Griffin, 1998). According to Reid, Shaywitz, and Shaywitz (2003, p. 2), dyslexia is a specific learning disability that is neurobiological in origin. It is characterized by difficulties with accurate and/or fluent word recognition and by poor spelling and decoding abilities. These difficulties typically result from a deficit in the phonological component of

1. Please send correspondence to: Katia Hazouri, email: katia.hazoury@lau.edu.lb, Ahmad Oweini, email: aoueini@lau.edu.lb, Rima Bahous, email: rbahous@lau.edu.lb, Lebanese American University, Education Division, P.O. Box 13-5053, Chouran Beirut 1102 2801, Lebanon

language that is often unexpected in relation to other cognitive abilities and the provision of effective classroom instruction. Secondary consequences may include problems in reading comprehension and reduced reading experience that can impede growth of vocabulary and background knowledge.

Arabic Features

Common miscues related to the distinctive features of the Arabic language have been noted among dyslexic Arabs, particularly with respect to its morphology and orthography which affect reading acquisition and types of miscues readers make in general (Ibrahim, Eviatar, & Aharon-Peretz, 2002).

Morphology

The Derivational Morphology

There are two different types of derivational Arabic morphology: verbal and normal word patterns (Abu- Rabia, & Awwad, 2004). Azzam (1990) explains that the Arabic grammar is characterized by roots and patterns. The consonantal roots are generally trilateral or quadrilateral (Abu- Rabia & Awwad, 2004; Azzam, 1990), provide the distinctive features of every word and reflect its basic lexical meaning. That is, Arabic words derive from three or four consonants (Abu- Rabia & Awwad, 2004; Azzam, 1990). Different patterns reveal different grammatical meanings and function of a particular word, such as the word's gender, number, whether it is a noun or verb, concrete or abstract (Azzam, 1990) such as عامِلٌ (one male worker) عَمَلَ (a noun that means work).

Inflectional Morphology

It is constructed by attaching prefixes and suffixes to the root word (Abu-Rabia & Awwad, 2004). If we take the root verb أَكَلَ /akala/ (he ate), we can derive the verbs يَأكلون (they are eating – referring to males) and أكلوا (they ate – referring to males). Thus, the morphological units of the Arabic language rely on intertwining root and word patterns.

Orthography

Arabic orthography and its effect on reading acquisition for novice/dyslexic readers as opposed to skilled readers have direct implications for the development of the proposed remedial reading technique.

Orthography can be defined as the understanding of the writing conventions of the language and the correct and incorrect spellings of words. The Arabic writing system is an alphabetic, phonologic, inflectional, and consonantal language (Azzam, 1990; Abu-Rabia, 1997). The characters of Arabic letters vary in shape depending on their position in the word. There are six Arabic vowels: three short vowels (represented by additional diacritics) and three long ones. Short vowels are in general gradually removed from the text in upper grade levels (Azzam, 1990; Abu-Rabia, 1997); learners then compensate the absence of vowels by increasing their dependency on grammatical and lexical decision-making (Azzam, 1990).

Dyslexia in Arabic

This section discusses four different features of Arab dyslexics relative to skilled readers in regard to Arabic orthography.

Visual-Orthographic

Abu-Rabia, a leading researcher on dyslexia in Arabic, has been investigating some cognitive processes of normal versus dyslexic readers since 1995, and has consistently found that the most effective reading strategy of the dyslexic Arab student is visual-orthographic (Abu-Rabia, 1995; Abu-Rabia & Siegel, 1995). Recent studies further corroborated previous findings. Specifically, results showed that the control group, matched by age and reading level, outperformed dyslexic readers in phonological decoding, syntax, morphology, and working memory. However, on orthographic measures, dyslexic students outperformed the control group matched by age; and performed equally to the control group matched by reading level (Abu-Rabia, Share, & Mansour, 2003). It can be safely concluded that Arab dyslexics are believed to be more adept at visual-orthographic than phonological processing.

Over Reliance on Context

Context and reading ability are interrelated, given the nature of Arabic orthography and the existence of homographs. In literary Arabic, almost every word in a passage can be a homograph representing several meanings: a noun, a verb, or a conjunction (Abu-Rabia & Siegel, 1995). For example, the word مثل when presented unvowelized could be a conjunction meaning *resemble*, or a noun meaning *proverb* (Abu-Rabia & Siegel, 1995). Therefore, a minor error in short vowels can lead to a reading miscue. If the text is not vowelized, skilled readers must rely on their contextual clues and prior knowledge in order to avoid homographs (Abu-Rabia & Siegel, 1995; Abu-Rabia et al., 2003), which is a cognitively demanding task. Further, when short vowels are not present, reading accuracy drops, and context becomes requisite to recognize words and disambiguate homographs (Abu-Rabia, 2002). This makes the reading process for skilled readers with unvowelized texts an interactive-dynamic process of context, word recognition and accuracy (Abu-Rabia, 1997, 1997b, 2000; Abu-Rabia & Siegel, 1995). Arabic is probably the only Semitic language in which the readers must first understand the gist of the text in order to read correctly (Abu-Rabia, 2002).

Word-Recognition

Reading development in Arabic involves three stages: sight word vocabulary, decoding with the application of phonology, and orthographic reading in 'large chunks' (Abu-Rabia, 1995). In Arabic, the reading process of 'larger chunks' is highly complex and requires skillful reading (Azzam, 1984; Ibrahim, Eviatar, and Aharon-Peretz, 2002).

Therefore, Abu-Rabia (2002) proposed a new model to explain the reading process in Arabic orthography. Poor readers who read vowelized texts rely on phonemic awareness to decode orthographic units. The faster the readers manage to build up the right phonological representation, the more chances they have to access the mental lexicon (meaning) and then receive priming assistance from the sentence context (Abu-Rabia, 2002). Meaning and sentence context enhance and compensate each other during the reading process (Abu-Rabia, 2002).

Skilled readers, on the other hand, who read unvowelized text draw heavily on sentence context and other resources that they bring to the text (morphology and syntax). They are aware of the significance of the short vowel at the end of the word that marks the word's grammatical function (Abu-Rabia, 2002).

Reading Accuracy

Another group of studies conducted by Abu-Rabia (1997 & 1997b) tested the influence of vowels on context and reading accuracy among poor and skilled Arab readers. All paragraphs, sentences, and isolated words were presented in three different styles: fully vowelized, partially vowelized, and unvowelized. Results show that reading vowelized Arabic paragraphs involves a combination of word recognition and vowel processing (Abu-Rabia, 1997). Vowels proved to be an essential facilitator in the process of word identification and reading comprehension (Abu-Rabia & Siegel, 1995; Abu-Rabia, 2002). Consistent with this finding, skilled readers and poor readers performed less successfully with the partially unvowelized words than with the fully vowelized words (Abu-Rabia, 1997); and both performed very poorly in reading isolated unvowelized words (Abu-Rabia & Siegel, 1995; Abu-Rabia, 1997; Abu-Rabia, 2000). Therefore, unvowelized isolated words greatly reduce reading accuracy (Abu-Rabia, 1997). Further, when these words are read in context, as sentences and paragraphs, the role of vowels is reduced, showing an insignificant effect, which reflects the essential role played by the context (Abu-Rabia, 1997).

Teaching Guidelines

The authors' experience with teaching bilingual Lebanese dyslexic students showed that the latter responded well to an explicit, multisensory phonics approach in identifying letters and sounds, and benefited from such structured commercial programs as Recipe for Reading (Traub & Bloom, 2005). The virtual inexistence of similar programs in Arabic led the authors to experiment with various teaching approaches and derived these instructional guidelines for teaching Arabic decoding:

1. Teach phonetically and/or orthographically similar letters apart, in keeping with the Recipe for Reading where following pairs: d and b, p and q, c and g, m and w, and u and n are taught apart.
2. Start with easily pronounced letters then move to the more difficult ones, consistent with the all commercial phonics programs such as Recipe for Reading and the Simultaneous Multisensory Technique (Brazeau, 1998).
3. Teach that letters have sounds, and letter and vowel sounds are blended together, for example, د/d/ and ـَ/a/ make دَ/da/. All English phonics programs consider vowel sounds as different phonemes when blended with consonants.

   Therefore, short and long vowels should be treated as separate phonemes **unlike** all Arab curricula that mistakenly consider دَ /da/ as one phoneme instead of two.

   This is based on the explicit phonics approach that purports to remediate the dyslexics' core problem in sound identification (Chard et al, 2002). Research on effective reading methodology suggests that early and direct teaching of phoneme-grapheme relationships enhances decoding abilities than later explicit phonics instruction especially among dyslexic children

(Ehri, 2002; Uhry & Clark, 2005). Further, learners who are unable to segment the speech stream into phonemes or are unable to associate the basic units of sound to the alphabetic symbols are the most disadvantaged in the acquisition of reading (Ellis, 1997; Aaron & Kotva, 1999; Lundberg, 1999; Chard et al., 2000). Therefore, blending phonemes together in order to form oral words is critical to acquiring reading skills, and segmenting oral words into phonemes is critical to spelling skills (Chard et al., 2000).

4. Introduce the long vowel sound first. Short and long vowel sounds are very confusing since they have the same utterance and the same lip formation and differ only in the length of the utterance. Students can more easily identify long vowels since they are auditorily distinct from short vowels. Teach vowel sounds in pairs: i.e. long and short /i/ sound. This helps the student discriminate long/short vowels of the same type (fateh, kasir, dam) and stress the kinesthetic movement of the lips (the simple and the exaggerated one).

   The Recipe for Reading introduces vowel digraphs together (such as oo). It is recommended to teach vowel sounds with the same utterance in pairs starting with the long sound since it is easier to identify and produce.

5. Use kinesthetic movements of the hand (tapping on the short sound and patting on the long sound) to discriminate short and long vowel sounds with the target letter: i.e., دو/doo/ as in "food" and دُ /doo/ where the oo is short as in "foot" in keeping with the multisensory approach.

6. Use a different color to represent long and short vowels. Long vowels are problematic to students since they are represented by consonant letters as is the case with most phonics programs.

7. Introduce the sound of the target letter, then the various shapes of this letter, before blending this letter with short and long vowel sounds. This is strictly related to Arabic orthography where letters have either two or four shapes depending on their position in the **word.** The explicit, also called synthetic, phonics approach refers to the teaching technique where grapheme-phoneme correspondences are explicitly taught before they are blended to form syllables or whole words (Uhry & Clark, 2005). The teacher directly tells students the sound represented by an individual letter before students see it in a word. The letters are first presented on a small card, sometimes called sound cards, for practice. After ample practice of the sound, this sound is then synthesized into a word together with other already-learned letters. For example, if we take the word cat, following the synthetic approach, children take apart the three letters, pronounce the phoneme for each letter, and then blend the phonemes together to pronounce the targeted word. Thus, the targeted words for reading are built from known parts.

8. Teach the sukoun after the vowel sounds. Unlike English, teach the consonant sound of a letter (letter with sukoun) after introducing the letter with the vowel sounds. The Arabic language is a syllabic language where almost every consonant sound is controlled by a vowel sound, which makes reading syllabic rather than sounding out phonemic. This is also strictly related

to the Arabic language because unvowelized consonants (consonants not followed by a vowel sound) only exist at the end of the word or at the end of a syllable. Therefore, students should be introduced to more common features. Patterns such as CVCV are more common in Arabic than the CVC patterns because morphologically, words in Arabic are vowelized according to their grammatical patterns in the word.

9. Stress the following rules when introducing the sukoun:
   a. No word starts with sukoun in Arabic
   b. Sukoun divides the word into syllables
   c. A letter with sukoun cannot be sounded out separately; it is always blended with the preceding letter and treated as one unit. Therefore, phonemes cannot be sounded out; only syllables.
10. Use phoneme (mainly vowels) and orthographic alteration. Students should recognize the difference between دْر /door/ as in "foot" and دور /door/ as in "food."
11. Teach consonant letters و ،أ and ي that represent long vowel sounds after students have mastered all vowel sounds and their representations (they should have mastered at least 10 letters with all the vowel sounds). Provide exercises to discriminate between these letters as part of the root word or as long vowels. For example, بُيُريِّدُ, وُعودُ each word has a letter that is repeated twice. The letters in rectangles represent long vowels; the rest of the letters represent the root words.
12. After students have mastered phonetically/orthographically similar letters, provide exercises to discriminate phonetically/orthographically similar letters: i.e. س and ش; ذ and ظ; and ك and ق. The second stage is the discrimination net, guessing when the graphemic information becomes essential for guessing words. Students compare the graphemic information in a new word to that in other similar words already present in their mental lexicon. They look for common features found in the new word and the other stored ones. At first, the learner uses the initial letters as a clue, and then moves to other features, such as the length of the word and the middle and end letters (Awaida, 1992).
13. When discussing "tanween", /n/ produced by a diacritic, provide word discrimination activities ending with letter 'n' in the root word or ending with sound /n/ produced by diacritics (both are put in squares), لِسانٌ/lisan/ and سَمَرٌ /samaron/.
14. Use self-correcting strategy. Do not correct for the student. Show him the representation of the miscue and lead him to compare between the miscue and the target word.
15. Start spelling rules as they are affected by grammar upon complete mastery of the letter sounds and shapes. For example, أكلوا (they ate) /akalou/, the last letter ا, which represents the verb format in plural is silent. If, hypothetically, it were to be vocal, then it would be 'akaloua', a word that does not exist in Arabic.

Description of the Proposed Technique

The main characteristics of the proposed technique are summarized as follows:

First, it follows the explicit approach (also called synthetic): reading specialists are almost unanimous that phonics should be part of reading instruction (Uhry & Clark, 2005). Research on effective reading techniques suggests that early and direct teaching of phoneme-grapheme relationships enhances decoding abilities than later explicit phonics instruction, especially among dyslexic children (Uhry & Clark, 2005) and when taught systematically (Chard, Pikulski, & Templeton, 2000). The rationale of using an explicit over an analytic phonics approach (moving from whole to part) is based on Uhry and Clark's (2005) conclusion that explicit phonics is the strategy of choice for children with phonological deficits which are at the heart of dyslexia.

The instructional technique assumes that grapheme-phoneme correspondences are explicitly taught before they are blended to form syllables or whole words (Uhry & Clark, 2005). The teacher directly tells students the sound represented by an individual letter before students see it in a word. The letters are first presented on a small card, sometimes called sound cards, for practice (Uhry & Clark, 2005; Chard et al., 2000). After ample practice, this sound is then synthesized into a word together with other previously learned letters (Uhry & Clark, 2005). However, in writing, the sequence is reversed. First, children say the word, segment it into phonemes, and then write each grapheme representing the pronounced phonemes until they write the entire targeted word (Snow et al., 1998). Thus, the student's attention will be directed to the phonological structure of oral language and to the connections between phonemes and spellings. It helps children who have not grasped the alphabetic principle decode unfamiliar words (Snow et al., 1998).

Second, it is systematic which refers to the carefully planned and sequenced instruction. The sequence of phonics instruction never subscribes to one paradigm, but rather follows some basic logical principles. Those principles involve moving from easy to difficult instructional activity; teaching the most useful information early and the less useful information later in the course; providing blending activities with phonetically regular words / non-words in order to highlight the sound-letter relationships; providing ample opportunities for practicing newly taught sounds and letters; and insuring cumulative review for the previously taught materials (Chard et al., 2000).

While introducing letters, the program establishes a routine in the sequence of the skills that makes the student feel on track and lets him/her focus on the new sounds rather than on how the lesson is progressing. Moreover, the sequence of lessons introduces phonetically/visually similar letters apart (see Appendix A).

Third, it is cumulative and vocabulary controlled. Every lesson is built upon previously learned concepts; that is, all words are vocabulary controlled and built only on previously learned letters and words. In very few cases, essential sight words are introduced, and the student is informed about how to read them by sight.

Fourth, it is font modified. All letters are smoothed out to their simplest appearance (see Appendix B). It was recognized while working with dyslexic students that details on letters are perceived as extraneous dots or slashes by the learn-

ing disabled, thereby adding to their confusion. For example, in regular Arabic print, the letter ظ may be perceived as having a slash and two dots instead of a slash and one dot.

Fifth, it is color-coded. A color scheme should be used to help identify the position of each letter in the word. Accordingly, letters are represented in four different colors to symbolize the basic shape and the three shapes are based on the letter's position in the word. In addition, all vowels (long and short) should be represented by a different color (the journal is printed in blank ink).

Sixth, it is multisensory: i.e. relies on the use of the sensory modalities (visual, auditory, and kinesthetic and tactile) pathways in order to reinforce learning in the brain (Hoefer, 2004).

The assumed benefits of the multisensory remedial training programs are summarized in four points. First, multisensory programs help create visual-auditory associations in learning grapheme-phoneme correspondences through kinesthetic activities; second, they help establish left-to-right progression; third, they encourage attention to details within letters or words that assist in word retrieval from long-term memory; and fourth, they provide more feedback to the teacher (Uhry & Clark, 2005).

Additionally, the multisensory approach eliminates boredom, increases the student's involvement time in learning, and gives attention to details.

The distinguishing feature of the proposed technique is the use of a multisensory approach where the student hears a word, identifies its sounds and relates the sounds to the colored shapes of letters in order to make the right orthographic representation of the target word (see Appendix C, the journal is printed in black ink).

Materials Needed

The proposed reading technique requires a tactile book, sound cards, a chart for shapes, a chart for sounds, five sets of plastic letters (four representing the position of the letters and one representing vowels and diacritics), and thick pencils to assure an exaggerated kinesthetic movement while writing letters and to make students more aware of the letter shapes (see Appendix D for a lesson sample in Arabic).

A Proposed Lesson Plan

The sequence of the lesson is as follows:

1. Review:
   - Visual kinesthetic: The student places the plastic letters in order and starts to name them while tracing them.
   - Visual auditory: The teacher reviews with the student the names and sounds of the previously learned letters by using plastic letters and sound cards.
   - Visual kinesthetic: The teacher reviews with the student the shapes of every learned letter using the chart for shapes and the red, black, and green plastic letters.

2. Introduction of the new letter:

Auditory: The teacher starts with a tongue twister where the target letter's sound is repeated. The student has to tell what sound is more frequently repeated.

Visual auditory: The teacher introduces a key word for the target letter. She helps the student associate the letter's shape to the letter's sound by using the sound card.

Kinesthetic and tactile: The student has to trace the letter in the tactile book forming the right gross motor movement. Then, he/she has to form the basic shape of the letter from play dough before he/she sky writes and desk writes the letter by making the right gross-motor movement.

Visual kinesthetic: The teacher guides the student to circle the different shapes of the target letter as present in words (see Number 1 in the sample lesson in Arabic, Appendix D).

Visual kinesthetic: The teacher helps the student identify the different shapes of the target letter by using plastic letters and the tactile book.

Visual kinesthetic: The student should trace inside the different shapes of the letter (see Number 2 in the sample lesson in Arabic, Appendix D).

Kinesthetic: The student writes the letters from memory as they appear in a word (see Number 3 in the sample lesson in Arabic, Appendix D).

Kinesthetic: The student fills in the blank with the right shape of the letter to complete some words (see Number 4 in the sample lesson in Arabic, Appendix D).

Since dyslexic Arabs are believed to be visual orthographic rather than phonological, it is preferable to use the orthographic route to get to the phonological one. Thus, not until students achieve mastery with the different orthographic representations of the same letter, are they introduced to the letter sound blended with short/long vowel sounds.

3. Introduction for short and long sounds:

Auditory: The teacher mentions two words having the target letter blended with a long and short sound. The student has to explain how the sounds are different.

Visual kinesthetic: The teacher shows how the sounds are formed by placing a blue plastic diacritic over the letter to represent a short sound and a blue plastic letter next to the letter to represent a long vowel sound.

Oral kinesthetic: The student is asked to write the letter with a diacritic to form a short vowel sound and the letter with the long vowel to form a long vowel sound.

The above three steps are repeated with all vowel sounds and the *sukoun* (the student completes numbers 6 to 12 as related activities, in the sample lesson in Arabic, Appendix D).

4. Application and drill and practice:

Auditory visual kinesthetic: The student has to read words and circle the target letter with a short vowel sound, and underline the target letter with a long vowel sound. At this point, the student should be able to identify the letter shapes and the short/long sounds, especially since

they are presented in different colors: red and blue (the journal is printed in black ink).

Auditory kinesthetic: The teacher says words and the student has to identify the place of the target letter (initial, middle or final position). Then, he/she has to write the letter on the dash representing its position with the right diacritic or long vowel sound (see Number 14 in the sample lesson in Arabic, Appendix D).

Visual: Number 15 is the application of real decoding. The student reads the sentences by applying all the rules he/she has learned. Students use the phonemic awareness to decode orthographic units. All words present are vocabulary controlled and vowelized.

Visual kinesthetic: Exercise 16 aims at orthographic discrimination. The student has to read the word on the right and match it with the similar word on the left.

Auditory kinesthetic: The teacher dictates the student words consisting of letters already learned (see Number 17 in the sample lesson in Arabic, Appendix D).

The student can use all the visual aids to complete this exercise: plastic letters, sound card, and the charts. The student is advised to follow the self-correction strategy. In case he/she misspells a word, the teacher makes him/her read the misspelled word and compare it with the target word.

It is recommended that this technique's effectiveness be empirically assessed using control groups. Further, to maximize its educational benefits, it may be augmented by workbooks, stories to reinforce letters, handwriting activities, story comprehension using the cloze technique, multiple-choice or matching, and finally, some word games such as Wordo (an adaptation of Bingo), crossword puzzles, scrambled letters, etc.

References

Abu-Rabia, S. (1995). Learning to read in Arabic: Reading, syntactic, orthographic and working memory skills in normally achieving and poor Arabic reader. Reading Psychology: An International Quarterly 16, 351-394.

Abu-Rabia, S. (1997). Reading in Arabic orthography: The effect of vowels and context on reading accuracy of poor and skilled native Arabic readers in reading paragraphs, sentences, and isolated words. Journal of Psycholinguistic Research 26(4), 165-482.

Abu-Rabia, S. (1997). Reading in Arabic orthography: The effect of vowels and context on reading accuracy of poor and skilled native Arabic readers. Reading and Writing: An Interdisciplinary Journal 9, 65-78.

Abu-Rabia, S. (2000). Effects of exposure to literary Arabic on reading comprehension in a diglossic situation. Reading and Writing: An Interdisciplinary Journal 13(1-2), 147-157.

Abu-Rabia, S. (2002). Reading in a root-based-morphology language: The case of Arabic. Journal of Research in Reading 25(3), 299-309.

Abu-Rabia, S., Awwad, J. (2004). Morphological structures in visual word recognition: the case of Arabic. Journal of Research in Reading 27, 321-336.

Abu-Rabia, S., Share, D., Mansour, M. (2003). Word recognition and basic cognitive processes among reading-disabled and normal readers in Arabic. Reading and Writing: An International Journal 16, 423-443.

Abu-Rabia, S., Siegel, L. (1995). Different orthographies different context effect: The effects of Arabic sentence context in skilled and poor readers. Reading Psychology: An International Quarterly 16, 1- 19.

Azzam, R. (1984). Orthography and reading of the Arabic language. In J. Aaron & R.M. Joshi (Eds.), Reading and Writing Disorders in Different Orthographic Systems (pp. 1-29). Kluwer Academic.

Azzam, R. (1990). The nature of reading and spelling errors of young children: A descriptive study. Unpublished doctoral dissertation, Columbia University, New York.

Brazeau, L. (1998). Simultaneous Multisensory Teaching, Collection E.M.S., Canadian Dyslexia Association, Ottawa, Canada.

Chard, D., Pikulski, J., Templeton, S. (2000). From Phonemic Awareness to Fluency: Effective Decoding Instruction in a Research-Based Reading Program. Houghton Mifflin Company.

Hoefer, A. (2004). The effect of a multisensory approach to improve special needs students' reading. Unpublished master's thesis, Graceland University, Cedar Rapids, Iowa.

Ibrahim, R., Eviatar, Z., Aharon-Peretz, J. (2002). The characteristics of Arabic slow its processing. Neuropsychology, 16 (3), 322-326.

Reid, L., Shaywitz, S., Shaywitz, B. (2003). Defining dyslexia, comorbidity, teachers' knowledge of language and reading a definition of dyslexia. Annals of Dyslexia 53, 1-14.

Snow, C., Burns, S., Griffin, P., (Eds.) (1998). Preventing Reading Difficulties in Young Children. National Reading Council, Washington, DC.

Traub, N., Bloom, F. (2005). Recipe for Reading. Educators Publishing Service, Cambridge, MA.

Uhry, J., Clark, D. (2005). Dyslexia Theory and Practice of Instruction. York Press, Inc., Baltimore.

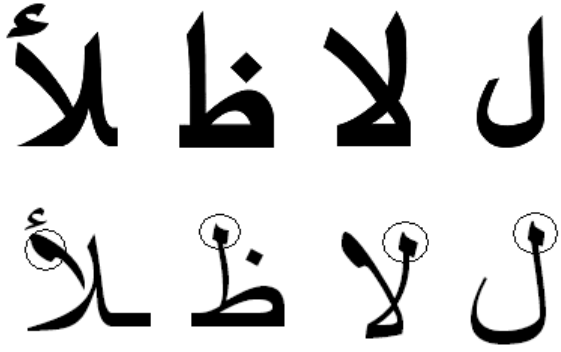
Received September 3, 2008
Revised December 6, 2008
Accepted December 11, 2008

Appendix A

الفهرس

١. د
٢. ر
٣. ب
٤. م
٥. س
٦. ز
٧. ن
٨. التنوين
٩. ل
١٠. ع
١١. و
١٢. ك
١٣. ه
١٤. ت
١٥. ة
١٦. ح
١٧. ي
١٨. ف
١٩. ج
٢٠. أ
٢١. الـ التعريف
٢٢. الشدّة
٢٣. ط
٢٤. خ
٢٥. ش
٢٦. ق
٢٧. ص
٢٨. ذ
٢٩. غ
٣٠. ض
٣١. ث
٣٢. ظ

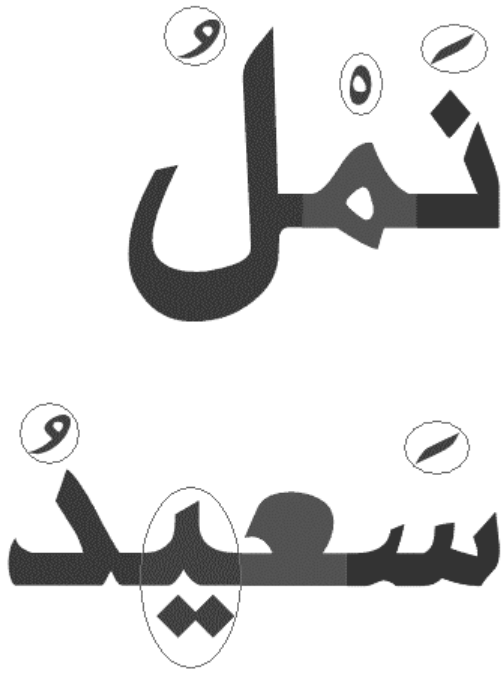
Appendix B



Modified Font

Appendix C

The circled parts represent vowels.



Appendix D

الدّرس الثّالث

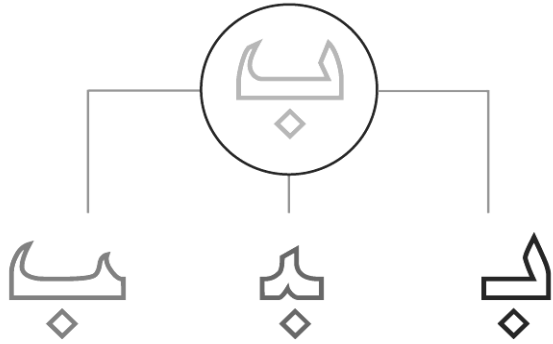
حرف الباء

بَقِيَتْ بَطَّةُ رَبابٍ البَيْضاءُ
في البَرِّيَةِ.

١. أضع دائرة حول حرف الباء.

أَرْنَبْ نَبْعُ لَبيبُ بِئْرُ

٢. ألوّن حرف الباء بمختلف أشكاله.



٣. أكتب شكل الباء في:

أوّل الكلمة	وسط الكلمة	آخر الكلمة
_____	_____	_____

٤. أكتب الباء بالشكل المناسب بحسب موقعها في الكلمة.

نَ□عُ	عِنَ□ُ	□َدْرُ
رَ□ا□ُ	رَ□يعُ	□ُسْتانُ
دولا□ُ	ذَنَ□ُ	نَ□يلُ

٥. أضع دائرة حول /بَ/ و /با/.

بَطَّةٌ بانَ بَدْرُ باسِمٌ

٦. أكتب الباء مع الفتحة والألف وأكرّر الصّوت.

بَ

با

٧. أضع دائرة حول /بُ/ و /بو/.

بُرَكُ بُسْتانُ بومَةُ دَبّوسُ

٨. أكتب الباء مع الضّمة والواو وأكرّر الصّوت.

بُ

بو

٩. أضع دائرة حول /بِ/ و /بي/.

رَبيعُ بِحارُ طَبيعَةُ بِساطُ

١٠. أكتب الباء مع الكسرة والياء وأكرّر الصّوت.

بِ

بي

١١. أضع دائرة حول الباء مع الصّوت القصير و سطراً تحت الباء مع الصّوت الطّويل.

مثلاً : بَدْرُ بانَ

رَبيعُ	بُدورُ	بِنايَةُ	بُسْتانُ	بَرِّيَةُ
نَبيعُ	زَنْبَقُ	رَبابَ	أَرْنَبُ	بانَ
باسِمُ	بَطَّةُ	بِئْرُ	بوري	بُنّي
بِساطُ	بورَةُ	بِحارُ	زَبيبُ	بَريدُ

١٢. أضع دائرة حول /بَ/.

نَبْعُ أَبْيَضُ سَبْعُ

١٣. أكتب حرف الباء مع السّكون.

بْ

١٤. أين أسمع صوت الباء في هذه الكلمات؟ أكتب حرف الباء مع الصوت في الفراغ المناسب.

___ ___ ___	___ ___ ___	___ ___ ___
___ ___ ___	___ ___ ___	___ ___ ___
___ ___ ___	___ ___ ___	___ ___ ___
___ ___ ___	___ ___ ___	___ ___ ___

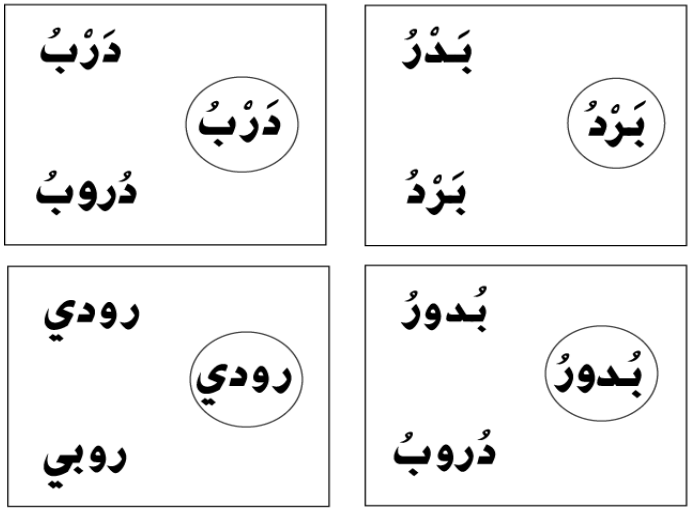
١٥. أقرأ الجمل التالية:

هذا دَرْبُ رَبابْ.

بَرَدَ رودي.

دارُ رودي بارِدْ.

١٦. أضع دائرة حول الكلمة التي توافق.



١٧. إملاء:

_____ _____ _____

_____ _____ _____

_____ _____ _____