

Enhancing Alphabet Knowledge Instruction: Research Implications and Practical Strategies for Early Childhood Educators

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Abstract Alphabet knowledge is consistently recognized as the strongest, most durable predictor of later literacy achievement. Recent research offers practical implications for increased effectiveness of teaching alphabet knowledge to young children. In this article, we outline Enhanced Alphabet Knowledge instruction (EAK), a method of practical instruction that early childhood teachers can use to organize, plan, and teach the essential skills of alphabet knowledge. EAK emphasizes identifying the letter name and sound, recognizing the letter in text, and producing the letter form, through flexible, distributed cycles of review based on factors that influence acquisition of alphabet knowledge.

Keywords Teaching alphabet knowledge · Letter names · Letter sounds · Writing alphabet letters · Early childhood instruction

Knowledge of the names, sounds, and symbols of the letters of the alphabet or alphabetic knowledge is essential for learning to read and write. Alphabet knowledge (AK) is consistently recognized as the strongest, most durable predictor of later achievement in literacy including decoding, comprehension, and spelling (National Early Literacy Panel 2008). Given the significance for children to successfully gain alphabetic knowledge, it is important to consider effective practices for teaching letter names, sounds, and written forms. In this article, we review

research on alphabet knowledge and effective instruction to outline Enhanced Alphabet Knowledge instruction (EAK), a method of practical instruction that early childhood teachers can use in their classrooms to organize, plan, and teach the essential skills of alphabet knowledge.

Recently, researchers have noted that current methods of AK instruction are failing to meet the needs of young children (Piasta and Wagner 2010). Traditional AK instruction in early childhood classrooms across the nation has focused on teaching one letter each week (Bowman and Treiman 2004). Unfortunately, this common practice is largely based on tradition rather than empirical validation as an effective instructional practice (Justice et al. 2006). Lengthy, drawn-out instruction that treats each letter as equal may be inherently flawed for several important reasons. For one reason, many young children are already familiar with some letters, making it unnecessary to devote an entire week to ‘learning’ a letter that is already known (Treiman et al. 1998). Second, for those students who are unfamiliar with alphabet letters, it will take 26 school weeks (or until about the middle of March) to learn the entire alphabet, thus further disadvantaging these students who are at-risk for reading difficulties (Piasta and Wagner 2010). Third, learning requires repetition and practice. During a typical 36-week school year, the traditional letter-a-week format allows for only one complete instructional cycle for teaching and learning the letters, sounds, and symbols of the alphabet. Finally, not all alphabet letters are created equal with regard to the difficulty or ease of learning, necessitating variation in instructional focus (Treiman et al. 2007b). Fortunately, recent research on AK instruction offers practical implications for increased effectiveness of teaching letter names, sounds, and forms to young children or to students struggling with this important literacy skill.

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Enhancing AK Instruction Through Brief Explicit Lessons

Alphabet knowledge lessons should be brief, explicitly teaching the letter's name, sound, and written form. In an article titled *N is for Nonsensical*, Neuman (2006) graphically describes a 55 min letter naming lesson conducted with young students:

And what's our letter of the week? Yes, it's N and n... Over the next 55 min, these children learned to point, circle, and underline the letter N. They recited it, drew it, and looked around the room for it. They heard it, saw it, even felt it, having it traced on their backs by their peers. And after sitting for what seemed to be an interminable amount of time in the circle, they were allowed the choice of tracing it, cutting it, or rolling modeling clay into the shape of it (p. 28).

Not only are lessons of this nature questionable as to age-appropriateness (Neuman 2006), but also as to the amount of instructional time dedicated to 'experiencing' a single letter. AK instruction is essential, but the purpose of learning the alphabet is *for reading and writing*. AK is a means, not an end. Spending so much daily time on a single alphabet letter steals instructional time from other meaningful literacy and content area experiences such as learning from, and talking and writing about narrative stories and informational texts.

Rather than prolonged lessons such as those described by Neuman (2006), AK lessons that are appropriately brief are effective for helping students develop alphabet knowledge when AK is explicitly taught (Jones and Reutzel 2012). An EAK explicit lesson format includes teacher modeling and guided practice for: (1) identifying the letter name and sound, (2) recognizing the letter in text, and (3) producing the letter form.

Each of these three steps includes teaching both the uppercase and lowercase form of each letter. Children typically gain proficiency with uppercase letters before lowercase letters (Smythe et al. 1971; Worden and Boettcher 1990) largely due to more frequent exposure with uppercase letters in environmental print (Bowman and Treiman 2004) and with initial uppercase letters in names (Treiman et al. 2007a). Students' knowledge of uppercase letters serves as a bootstrap in learning lowercase letters; when children know the uppercase letter, they are sixteen times more likely to know the corresponding lowercase letter (Turnbull et al. 2010). EAK lessons that teach both the uppercase and lowercase forms help teachers to build on students' prior experiences with uppercase letters to expand their knowledge of letters. Additionally, teachers can provide simple clarification that distinguishes the

uppercase and lowercase letter forms of graphically similar letters by placement of the letters on the lines of the paper. Although some teachers may traditionally teach the 26 letters first in uppercase form and then reteach the 26 letters again in lowercase letter form, this practice fails to build on students' familiarity with uppercase letters and increases the amount of time needed to teach the letters, thus delaying students' effective use of both uppercase and lowercase forms in reading and writing. In contrast, EAK lessons teach the name and sound of the uppercase and lowercase forms of each letter, and then students readily apply this knowledge in recognizing uppercase and lowercase forms in text and in producing both written forms of the letter.

When teaching letter sounds, we offer two suggestions. First, we suggest the teacher use the language 'the sound this letter *represents*' rather than 'the sound this letter *makes*' (Johnston 2004). Young children are frequently asked questions such as, "What sound does the cat make?" and the child will produce the sound made by the animal. In considering this explanatory language from a child's point of view, letters are not 'making' any sounds at all. Thus, teaching students the letters represent particular sounds helps to clarify instructional language. Second, when teaching young students the sound of a vowel letter, teach the short vowel sound (Jones and Reutzel 2012). This is easier for young students to understand and remember than the 'long or short vowel sound,' which can be taken quite literally by students. As a kindergarten child once explained, "The *a* in bad is a long vowel sound. Listen to me say it, /ăăăă/," and he produced the short *a* sound for over ten seconds, a very *long* time. In an EAK lesson, the name of the letter is taught followed immediately by the sound the letter represents. This instructional language is easily transferred to word reading as the teacher instructs the student to try either the vowel's name or its sound when decoding words. These simple changes in teacher language may help to avoid confusion for some children.

The three steps of an EAK lesson are designed to help students acquire alphabet knowledge and apply their knowledge to the context of reading and writing. Step 1 teaches students to identify the name and sound of the uppercase and lowercase forms of each letter. In Step 2, students immediately begin learning to recognize the letter contextually in books and other written text. In Step 3, students learn how to produce the letter forms for use in writing. Instruction that includes visual and verbal modeling of letter writing effectively improves students' letter formation automaticity and word reading ability (Berninger et al. 2006). Writing alphabet letters focuses young children's attention on the critical features that distinguish one letter from another, while building knowledge of letter names and sounds (Aram 2005). Additionally, students'

Table 1 Enhanced alphabet knowledge lesson template

<u>Explanation of Objective</u>
<p>Today, you will be learning the name, sound, and how to write the letter _____. Learning this letter will help you to read and write many words.</p>
<u>Instruction</u>
<p>Letter Name Identification: (~ 1-2 minutes)</p> <ol style="list-style-type: none"> This is the letter _____. This is the uppercase letter _____. This is the lowercase letter _____. (Show and/or write the letter, explaining the form.) Let's practice naming this letter. What is this letter? _____. (Point to uppercase and lowercase letters in different order at least 3 times asking students to identify the letter name).
<p>Letter Sound Identification: (~ 1-2 minutes)</p> <ol style="list-style-type: none"> The letter _____ represents the sound /____/. When I say the sound /_/ I place my tongue & mouth like this _____. (Provide explanations/stories/key words to help students remember the sound.) Let's practice saying the sound of this letter. The letter _____ represents the _____ sound. Say the _____ sound with me _____, _____, _____. (Point to uppercase and lowercase letters in different order at least 3 times asking students to identify the letter sound). <p><i>Hint:</i> For vowels, teach students the short vowel sound and explain that when reading words the vowel letter represents its name or its sound.</p>
<p>Recognizing the Letter in Text: (~ 3 minutes)</p> <ol style="list-style-type: none"> Now, let's see if we can find the letter _____. (Students locate the uppercase and lowercase letter in text and state the letter name and sound each time the letter is located) <p>There are a number of alternatives for student practice with recognizing the letter in text such as:</p> <ul style="list-style-type: none"> • sorting through magnetic letters/tiles to isolate the particular letter • identifying the letter in charts of classmates' names • using a crayon to circle the letter in newspapers or magazines • placing highlighter tape over the letter in easy-to-read children's books
<p>Producing the Letter Form: (~ 4-5 minutes)</p> <ol style="list-style-type: none"> Let me show you how to write the letter _____. Here's where I begin on the paper lines to write the letter _____. (Provide description and hints about how to write the uppercase and lowercase form of the letter). Let's practice writing the letter _____ together. <p>Producing the letter can also use alternatives for practice such as:</p> <ul style="list-style-type: none"> • using a transparency and marker to trace over the letter as it is identified in enlarged print from children's books • writing the letters on small white boards as the teacher dictates • producing the letter form with clay, pipe cleaners, wiki sticks <p><i>Note:</i> Tasks such as using a rubber stamp and ink to stamp the letter or gluing items to an outline of the letter (e.g. gluing beans on the letter <i>b</i>) is not producing the letter form as the form has already been produced and students are not required to think about <i>how</i> to create the form.</p>

handwriting movements during the writing of letters aid memorization and identification of letters (Longcamp et al. 2005). EAK lessons that explicitly and efficiently teach students how to (1) identify the letter name and sound, (2) recognize the letter in text, and (3) produce the letter form, provide students with the instruction needed to immediately use each letter in reading and writing. These appropriately brief lessons also allow time for students to participate in additional meaningful literacy and content area experiences. An EAK explicit lesson plan template to aid with instruction is included in Table 1.

Enhancing Alphabet Knowledge Instruction Through Multiple Distributed Instructional Cycles

AK instruction that focuses on one letter a week is not meeting the varied needs of young students (Bowman and Treiman 2004; Piasta and Wagner 2010). In reality, it makes little sense to expect that young students would be able to sufficiently learn and use the alphabet letters from 1 week-long exposure to each letter or from only one complete cycle through the alphabet. Yet research has consistently shown the importance of early childhood

learners mastering alphabetic knowledge to be successful readers (Durrell et al. 2008; Snow et al. 1998). Rather than the traditional method of one cycle of massed instruction, EAK instruction advocates teaching letters through multiple, distributed instructional cycles which allows for letters to be introduced, practiced, and revisited several times, as needed, during the school year.

Students learn AK best through frequent exposure and repetition to the letters (Justice et al. 2006; McBride-Chang 1999; Treiman et al. 2007b). EAK instruction that presents letters at a quicker pace than a letter a week allows for more than one instructional cycle during the school year, increasing frequency of exposure to the letters and allowing for multiple repetitions through distributed instructional review cycles. This would certainly benefit students with limited knowledge of the alphabet as they would be exposed to all 26 letters sooner and participate in multiple instructional cycles during the academic year. This would also benefit students that have knowledge of some or many letters, as they would learn less familiar or unknown letters sooner than they would with traditional alphabet instruction.

This then raises the question, what would be an appropriate pace for teaching AK? Research on mastery of item sets such as AK has shown that instructional review cycles should take place between 10 and 20 % of the total time period for which an item is to be remembered (Cepeda et al. 2009; Rohrer and Pashler 2010). Thus, during a 180 day school year, distributed instruction of AK should take place every 18–36 days (10 % of 180 days = 18 and 20 % = 36), or pacing that teaches approximately a letter per day rather than a letter per week. At a letter-a-day pace, it would take approximately 5 weeks to present 26 letter names and sounds allowing for up to seven possible distributed AK instructional review cycles during a school year. In a two-group study with kindergarten teachers that used traditional AK instruction and kindergarten teachers that incorporated EAK instruction (teaching explicit lessons during multiple, distributed instructional cycles using a letter a day pace), EAK resulted in statistically significant increases in AK student learning ($n = 329$) over the traditional letter-a-week AK instruction (Jones and Reutzel 2012). EAK teachers in this study noted that fewer than seven instructional cycles were needed for most kindergarten students to master AK. Students who learn letter names and sounds more quickly make greater progress in reading (Blaiklock 2004), and these same kindergarten teachers also expressed that students were demonstrating greater reading ability than noted in previous years when using the traditional letter-a-week AK instruction with one instructional cycle of the alphabet (Jones and Reutzel 2012).

Flexible Distributed Instructional Cycles Based on AK Learning Advantages

EAK instruction builds on these two important components of effective instruction: (1) brief, explicit lessons, (2) taught through multiple distributed instructional cycles, which leads to a third benefit of EAK instruction. Multiple instructional cycles allow for flexible instruction to better meet the needs of students, with extra focus on letters that are problematic for students to learn often due to less frequent exposure or use in oral or written language. In traditional AK instruction, each alphabet letter receives equal instructional time. However, because some letters are more difficult to learn, it makes little sense to spend the same amount of instructional time teaching each of the alphabet letters (Treiman et al. 1998, 1994). Research has identified several factors that influence ease of learning AK including: (1) Letters located at the beginning and end of the alphabet are learned more easily than letters in the middle of the alphabet, (2) Letter names that when spoken contain the sound represented by the letter are learned earlier and with greater ease than letters where the sound that the letter represents is not spoken in naming the letter; (3) If a letter's shape or form is distinctive from other letter shapes or forms, then letter discrimination is easier for young students than when letter forms or shapes share similar distinctive features; (4) Differential rates of exposure to the letters, such as the letters found in a student's own name or alphabet letters that occur more frequently in children's books and in printed materials in the child's environment, can also render the acquisition of letter knowledge more or less difficult for young learners (Gibson and Levin 1975; Treiman et al. 1994).

Explicit AK instruction and repetitive practice is particularly important for the more difficult to learn letters, especially for students with substantial disadvantages in AK (Lonigan 2003). Multiple instructional cycles make it possible for the teacher to take note of the more difficult letters and adjust instruction through pacing and exposure frequency. In designing and teaching the multiple distributed cycles of EAK instruction, each cycle of instruction focuses on a research-based advantage of AK acquisition (e.g., Justice et al. 2006; Rohrer and Pashler 2010; Treiman et al. 2007b). Based on the AK learning advantages, we describe in what follows six EAK instructional cycles. An overview of the six EAK instructional cycles is shown in Table 2.

EAK Instructional Cycle One: Own Name Advantage

The first EAK instructional cycle builds on children's experiences with their own names. Research has shown

Table 2 Enhanced alphabet knowledge instructional cycles

Cycle	Advantage rationale	Organizational pattern of instruction	Additional considerations
Own name advantage	Learning advantage for initial letter in first name	Based on frequency of initial letters in class members' names	Highly motivating and responsive to young students' developmental needs for constructing self-identity
Alphabetical order advantage	Learning advantage for alphabet sequential order	Alphabetic order or beginning with the letter <i>a</i> and ending with the letter <i>z</i>	Possible serial effects leading to difficulty with letters in the middle of the alphabet
Letter name-letter sound relationship advantage	Learning advantage for letters that have the letter sound pronounced in the letter name and for letters that represent one sound	Begins with the letters easier to learn proceeding to the more difficult to learn letters	Instruction may proceed rapidly though the easier letters, allowing increased instructional time for more difficult letters
Letter-frequency advantage	Learning advantage based upon letter frequency in environmental print and other printed materials	Begins with the letters occurring less frequently in text proceeding to the more frequently occurring letters	Goal is to increase focus on the letters more difficult to learn due to the lack of frequency in text
Consonant phoneme acquisition order advantage	Learning advantage based upon normative, developmental order of consonant phoneme acquisition	Begins with letters more frequently articulated and acquired earlier proceeding to letters for which children have less experience producing the sound	Teachers can use the normative developmental pattern to identify potential reasons for difficulty with particular letters and focus on oral speech that uses the more difficult to learn letters
Distinctive visual features letter writing advantage	Learning advantage based upon the number of distinctive features in written letter forms	Letters with similar features presented in small clusters over several days or presentation of letters with fewer distinctive features over subsequent days	Emphasis is on the critical distinctive features between similar letters

that children learn earlier how to name and print the initial letter of their own first name than any other letter in the alphabet (Treiman and Broderick 1998). EAK instruction in early childhood classrooms that builds on this own-name advantage makes good sense as using students' names to teach AK is highly motivating and responsive to young students' developmental needs for constructing self-identity in the classroom (Nuttin 1985).

The order for teaching letters in this cycle is based on the frequency of initial letters in students' names. The teacher writes each student's name on an index card and places the index cards under the appropriate letter on the alphabet frieze. Following a whole class discussion to analyze the frequency of initial letters, a chart listing the letters from most frequent to least frequent is made for reference in this instructional cycle. By using the explicit lesson template to teach both uppercase and lowercase forms of each letter, this instructional cycle provides a fun way for students to learn to read and write their own names and class members' names. Producing the letter form in this cycle could easily include interactive writing of student names. Our experience with this instructional cycle also revealed that students enjoy discussing how many letters still need to be presented until each letter in their name has been taught. A useful classroom resource for this EAK instructional cycle is the book *Teaching with Kids' Names* by Krech (2000).

EAK Instructional Cycle Two: Alphabetical Order Advantage

The second EAK instructional cycle focuses upon alphabetic order or beginning with the letter *a* and ending with the letter *z*. This approach is the most common organization for teaching AK (Justice et al. 2006). Following the explicit lesson format, this instructional cycle of the alphabet teaches the 26 letters in alphabetical order in 26 days. Practice with letter name and sound identification, recognizing the letter in text, and producing the letter grapheme could incorporate singing, reading aloud, and playing games that present AK in alphabetical order. In addition to the traditional alphabet song, ABCDEFG..., other songs that can be used to reinforce AK can be found online at www.songsforteaching.com, www.rocknlearn.com, and www.jazzles.com. Children's books that present the letters in alphabetical order (over 23,000 on Amazon) are available on a multitude of topics such as: *Dr. Seuss's ABC* (great for letter names and sounds) (Geisel 1991), *Alphabet City* (Johnson 1995), and *Alphabet Under Construction* (both focus on the letter form) (Fleming 2006). AK sites with a variety of children's AK learning games include: www.internet4classrooms.com/kplus_alpha.htm, www.abcy.com/kindergarten_computers.htm, and www.playkidsgames.com/alphabetGames.htm.

Although alphabetical order is the prevalent organization for AK instruction, it is important that this not be the

only organizational patterns for teaching letters. When letters are consistently presented in alphabetical order, students exhibit an order effect with greater retention for the letters at the beginning and end of the alphabet than for the letters in the middle of the alphabet (the perennial LMNOP problem; McBride-Chang 1999). Therefore, each EAK instructional cycle offers teachers a research-based alternative organizational pattern for teaching letters.

EAK Instructional Cycle Three: Letter Name-Letter Sound Relationship Advantage

Young children use letter names to learn and remember letter sounds (Treiman et al. 1998). It is easier for children to learn the letters that have the letter sound pronounced in the letter name (for example: *b, p, f, m*) than to learn the letters that do not have a relationship between the letter name and sound (for example: *h, q, w, y*). Children also more easily learn a letter that represent one letter sound (such as the letter *m* representing the /m/ sound) than a letter that represents more than one sound (such as the letter *c* that represents two common sounds /k/ and /s/). When pronouncing a letter name, there are two orally articulated positions for the sound associated with the letter. The letter sounds associated with letter names such as *a, b, d, e, i, j, k, o, p, t, u, v, z* are found in the first position or onset of a consonant vowel (cv) syllable when the letter name is pronounced—the letter *b* for example: /b/ followed by a long /e/ sound. Letter sounds associated with letter names such as *f, l, m, n, r, s* are found in the second position or after the vowel sound in a vowel consonant (vc) syllable when the letter name is pronounced—the letter *m* for example: short /e/ followed by the /m/ sound. Research by Treiman and Broderick (1998) found that letter names with a cv pronunciation pattern are learned more easily than those letter names with a vc pronunciation pattern. On the other hand, letter names of both cv and vc pronunciation patterns are learned more easily than those letters that do not have a letter sound relationship or those letters with more than one sound. This letter name-letter sound relationship advantage provides another alternative for an EAK instructional cycle that begins with the letters easier to learn, proceeding to the more difficult letters.

This instructional cycle begins with the consonant letters that have the letter sound at the beginning of the letter name (*b, d, j, k, p, t, v, z*), followed by consonant letters that have the sound at the end of the letter's name (*f, l, m, n, r, x*). Consonants with no association between the letter name and its sound (*h, q, w, y*) and those with more than one sound (*c, g, s*) are likely to be most difficult for students to learn; accordingly, increased instructional time would be devoted to these letters through repeated lessons disbursed throughout the cycle. Since children are taught that the

vowels represent the letter name or sound, this simplifies learning of the vowel letters. Using this advantage to guide an EAK instructional cycle with a focus upon the easier letters first builds a sense of accomplishment in students and provides a foundation for learning the more difficult letters. In addition, instruction may proceed rapidly through the easier letters, allowing teachers additional instructional time to focus on the more difficult letters.

EAK Instructional Cycle Four: Letter-Frequency Advantage

Anyone who has played Hangman, Scrabble, or other letter-related games recognizes the advantage of letters that occur frequently in text. This same advantage impacts children's AK; letters to which students are exposed more frequently are learned earlier and more easily. The Letter-Frequency Advantage instructional cycle takes into consideration the potential difficulty of learning specific letters based upon the letter frequency in environmental print and other printed materials (Fry 2004; Hanna et al. 1971; Smythe et al. 1971). The consonant letters from most to least frequent are: *r, t, n, s, l, c, d, p, m, b, f, v, g, h, k, w, x, z, j, q, y*. The vowel letters from most to least frequent are: *i, a, e, o, u*.

The goal of this EAK instructional cycle is to increase focus on the letters more difficult to learn due to the lack of frequency in text. Interestingly, some of the letters identified as more difficult to learn because of the letter sound-letter name relationship also appear less frequently in printed language, such as the letters *q, w, and y*. Thus, some letters may have double or even triple deficits in ease of learning due to factors related to the letter, to the student, or to the instructional environment. While a "relatively small amount of instruction" is sufficient for the easier-to-learn letters, the same amount of instruction is insufficient for the more difficult-to-learn letters (Treiman et al. 1998, p. 1535).

The order of letter presentation in this EAK cycle begins with the letters occurring less frequently in text. Lessons emphasizing less-frequently occurring letters will focus students' attention on identifying, recognizing, and producing these letters. Instruction then proceeds to the more commonly-used letters. As students are likely familiar with the most frequently occurring letters, teachers might consider including several letters in a single review lesson during this instructional cycle. This instructional cycle helps teachers to plan targeted instruction for those letters likely to be more difficult for most students to learn because of frequency in print.

EAK Instructional Cycle Five: Consonant Phoneme Acquisition Order Advantage

When learning to speak, young children acquire some letter sounds before others. Research has shown that this order of

acquisition impacts learning of the alphabet, providing one more advantage to consider in EAK instruction. Acquisition of letter sounds follows a mostly invariant trajectory of development (Sander 1972; Stoel-Gammon 1987). Although vowel sounds are typically mastered by age one, acquisition of consonant sounds occurs more gradually, extending into the early elementary years. The normative, developmental order of consonant phoneme acquisition includes the consonant phonemes of *n, m, p, h, t, k, y, f, ng, b, d, g, w,* and *s* during the first 4 years of oral language development. The consonant phonemes acquired after age 4 include: *l, r, v, z, sh, ch, j, zh,* and *th* (voiced sound as in *that* and unvoiced sound as in *think*). The more frequent articulation of earlier-acquired sounds make those letters easier to learn than the letters for which children have less experience producing the sound (Justice et al. 2006). Thus, potentially troublesome letters to learn are for the consonant phonemes acquired after age four (*l, r, v, z, sh, ch, j, zh, th*). Knowledge of this *consonant phoneme order* provides teachers one more possible variation of EAK instruction.

EAK Instructional Cycle Six: Distinctive Visual Features Letter Writing Advantage

While the first EAK instructional cycle builds on the established correlation between writing one's own name and reading skills (Molfese et al. 2006), this instructional cycle focuses on the features of written letters. Letter forms are identified through detection of distinctive visual features which include: (1) terminations, (2) straight lines, (3) curved lines, (4) diagonal lines, and (5) intersections (Fiset et al. 2008; Gibson 1969; Townsend and Ashby 1982). The greater the number of distinctive features shared by letters, the more difficult it is for young learners to distinguish between the letters. For example, the letters *C* and *G* share three curves, differing only in the point of termination and the horizontal straight line in *G* (Fiset et al. 2008), while the letters *z* and *o* have no common features (Gibson 1969).

When teaching this cycle of EAK, teachers can emphasize the critical differences between similar letters. Letters that share several distinctive features include: *E/F, M/N/W, P/R, b/d/p/q, m/n/u* (Gibson and Levin 1975). During this instructional cycle, letters with similar features can be presented in small clusters over several days. For example, the letters *C* and *G* could be taught with emphasis on the features that distinguish the two letters. Verbal mnemonics of the motor sequence (to write a *t*, straight line down and line across the center) are helpful for letter production (Hayes 1982). Verbal mnemonics can be extended to emphasize the critical differences between similar letters (first we have an *O*, add a tail and it becomes a *Q*). Alternatively, teachers could present letters that have

fewer distinctive features in common over subsequent days (for example, *p* and *m*), which may decrease letter confusability as students have more time to integrate use of one letter before learning another letter with similar features.

Automatic letter writing is the single best predictor of quality and length of written composition for elementary students (Graham et al. 1997); thus, each EAK lesson includes teacher modeling and guided practice for: (1) identifying the letter name and sound, (2) recognizing the letter in text, and (3) producing the letter form. This instructional cycle provides teachers an additional opportunity to capitalize on the relationship between children's writing and understanding of letters.

Conclusion

Although AK instruction has traditionally followed a letter-a-week format with students participating in a variety of activities for each letter such as those described by Neuman (2006), our recent research has shown increased student learning from a reorganization of traditional instruction to Enhanced Alphabet Knowledge (EAK) instruction (Jones and Reutzel 2012). Importantly, EAK instruction provides teachers with several important benefits for teaching alphabet knowledge to young learners. First, EAK offers a three-step outline for lesson plans that explicitly and efficiently teach students to identify the letter name and sound, recognize the letter in text, and produce the letter form. This lesson format is easy to use and includes the essential components alphabet knowledge. The importance of using the language of teaching has been considered in the lesson design, and the lesson template included with this article provides specific explanatory language to aid teachers when planning and teaching EAK lessons. Second, EAK presents a research-based alternative for instructional pacing. Rather than the traditional letter-of-the-week pacing, EAK encourages teachers to consider the inherent differences between letters and potential ease of learning due to factors related to the letter, to the student, or to the instructional environment. Teachers can vary instructional pacing, with more time devoted to the letters students are having difficulty learning and less time to letters students already know. Teachers can also strategically revisit the more difficult to learn letters. A third benefit of EAK, and perhaps the most important, is that EAK provides teachers with multiple cycles of instruction that are based on recent research evidence (see Table 2 for overview of six cycles and research-based advantages) about acquisition of alphabet knowledge. These instructional cycles provide teachers with critical information about research-based advantages for instruction and possible organizational patterns for instruction. Teachers can flexibly use these

instructional cycles to tailor instruction to meet students' needs. During each instructional cycle, the teacher monitors student progress to identify which letters are more difficult for students. Then, using the six research-based acquisition advantages to analyze why the letters may be more difficult, the teacher can select an appropriate instructional cycle to use next in addressing students' needs. EAK instructional cycles can be used when teaching young students alphabet knowledge in whole class settings or in small groups. Multiple instructional cycles afford the teacher opportunity to continue instruction for those students still needing alphabet knowledge instruction and to discontinue alphabet instruction for students who have developed mastery of alphabet knowledge. This differentiation in instruction is made simpler because EAK lessons are relatively brief (~10 min); thus, the teacher can continue EAK lessons for some students while other students work in small groups or independently on other literacy skills.

In an alphabetic language, breaking the alphabetic code is essential for learning to read and write accurately and effortlessly (Snow et al. 1998); and students who learn letter names and sounds more quickly make greater progress in reading (Blaiklock 2004). It is our hope that Enhanced Alphabet Knowledge instruction will help teachers to place students firmly on the path of reading success. In summary, we suggest these practical guidelines for EAK instruction.

Guidelines for Enhanced Alphabet Knowledge (EAK) Instruction

1. EAK lessons are brief and explicitly teach letter names, sounds, and written symbol.
2. The 3 components of an EAK lesson are: (a) identifying the letter name and sound, (b) recognizing the letter in text, and (c) producing the letter form.
3. EAK lessons include teaching both the uppercase and lowercase form of the letter.
4. EAK instruction provides differential exposure to the alphabet letters as all letters are not created equal in ease-of-learning.
5. EAK instruction uses multiple, distributed instructional cycles (letter-a-day) rather than massed instruction with only one cycle of exposure to the alphabet (letter-a-week).
6. EAK instruction connects the research-based alphabet knowledge acquisition advantages to the distributed instructional cycles, providing alternatives and variety for alphabet instruction in whole class or small group settings.
7. During each EAK distributed instructional cycle, the teacher keeps record of which letters are more difficult for students to learn and applies knowledge of the research-based acquisition advantages to analyze student difficulties and flexibly adjusts pacing, exposure frequency, and focus to meet students' needs.

References

- Aram, D. (2005). Continuity in children's literacy achievements: A longitudinal perspective from kindergarten to school. *First Language, 25*, 259–289.
- Jones, C. D., & Reutzel, D. R. (2012). Enhanced alphabet knowledge instruction: Exploring a change of frequency, focus, and distributed cycles of review. *Reading Psychology: An International Journal, 33*(5), in press.
- Berninger, V. W., Rutberg, J. E., Abbott, R. D., Garcia, N., Anderson-Youngstrom, M., Brooks, A., et al. (2006). Tier 1 and tier 2 early intervention for handwriting and composing. *Journal of School Psychology, 44*, 3–30.
- Blaiklock, K. E. (2004). The importance of letter knowledge in the relationship between phonological awareness and reading. *Journal of Research in Reading, 27*, 36–57.
- Bowman, M., & Treiman, R. (2004). Stepping stones to reading. *Theory into Practice, 43*, 295–303.
- Cepeda, N. J., Coburn, N., Rohrer, D., Wixted, J. T., Mozer, M. C., & Pashler, H. (2009). Optimizing distributed practice: Theoretical analysis and practical implications. *Experimental Psychology, 56*, 236–246.
- Durrell, D., Nicholson, A., Olson, A. V., Gavel, S. R., & Linehan, E. B. (2008). Success in first-grade reading (reprinted from 1958). *Journal of Education, 189*, 1–21.
- Fiset, D., Blais, C., Ethier-Majcher, C., Arguin, M., Bulb, D., & Gosselin, F. (2008). Features for uppercase and lowercase letter identification. *Psychological Science, 19*, 1161–1168.
- Fry, E. (2004). Phonics: A large phoneme-grapheme frequency count revisited. *Journal of Literacy Research, 36*, 85–98.
- Gibson, E. J. (1969). *Principles of perceptual learning and development*. New York, NY: Prentice-Hall.
- Gibson, E. J., & Levin, H. (1975). *The psychology of reading*. Cambridge, MA: MIT Press.
- Graham, S., Berninger, V., Abbott, R., Abbott, S., & Whitaker, D. (1997). The role of mechanics in composing of elementary school students: A new methodological approach. *Journal of Educational Psychology, 89*, 170–182.
- Hanna, P. R., Hodges, R. E., & Hanna, J. S. (1971). *Spelling: Structure and strategies*. Boston, MA: Houghton-Mifflin.
- Hayes, D. (1982). Handwriting practice: The effects of perceptual prompts. *Journal of Educational Research, 75*, 169–172.
- Johnston, P. H. (2004). *Choice words*. Portland, ME: Stenhouse Publishers.
- Justice, L. M., Pence, K., Bowles, R. B., & Wiggins, A. (2006). An investigation of four hypotheses concerning the order by which 4-year-old children learn the alphabet letters. *Early Childhood Research Quarterly, 21*, 374–389.
- Krech, B. (2000). *Teaching with kids' names*. New York, NY: Scholastic.
- Longcamp, M., Zerbato-Poudou, M., & Velay, J. (2005). The influence of writing practice on letter recognition in preschool children: A comparison between handwriting and typing. *Acta Psychologica, 119*, 67–79.

- Lonigan, C. J. (2003). Development and promotion of emergent literacy skills in children at-risk of reading difficulties. In B. R. Foorman (Ed.), *Preventing and remediating reading difficulties* (pp. 25–50). Baltimore, MD: York.
- McBride-Chang, C. (1999). The ABCs of the ABCs: The development of letter-name and letter-sound knowledge. *Merrill-Palmer Quarterly*, *45*, 285–308.
- Molfese, V. J., Beswick, J., Molnar, A., & Jacobi-Vessels, J. (2006). Alphabetic skills in preschool: A preliminary study of letter naming and letter writing. *Developmental Neuropsychology*, *29*, 5–19.
- National Early Literacy Panel (NELP). (2008). *Developing early literacy: Report of the national early literacy panel*. Washington, DC: National Institute for Literacy.
- Neuman, S. B. (2006). N is for nonsensical: Low-income preschool children need content-rich instruction, not drill in procedural skills. *Educational Leadership*, *64*, 28–31.
- Nuttin, J. M. (1985). Narcissism beyond Gestalt and awareness: The name letter effect. *European Journal of Social Psychology*, *15*, 353–361.
- Piasta, S. B., & Wagner, R. K. (2010). Developing early literacy skills: A meta-analysis of alphabet learning and instruction. *Reading Research Quarterly*, *45*, 8–38.
- Rohrer, D., & Pashler, H. (2010). Recent research on human learning challenges conventional instructional strategies. *Educational Researcher*, *39*, 406–412.
- Sander, E. K. (1972). When are speech sounds learned? *Journal of Speech and Hearing Disorders*, *73*, 55–63.
- Smythe, P. C., Stennett, R. G., Hardy, M., & Wilson, H. R. (1971). Developmental patterns in elemental skills: Knowledge of uppercase and lower-case letter names. *Journal of Reading Behavior*, *3*, 24–33.
- Snow, C. E., Burns, M. S., & Griffin, P. (1998). *Preventing reading difficulties in young children*. Washington, DC: National Academy Press.
- Stoel-Gammon, C. (1987). Phonological skills of 2 year olds. *Language, Speech, and Hearing Services in the Schools*, *18*, 323–329.
- Townsend, J. T., & Ashby, F. G. (1982). Experimental test of contemporary mathematical models of visual letter recognition. *Journal of Experimental Psychology*, *8*, 834–864.
- Treiman, R., & Broderick, V. (1998). What's in a name: Children's knowledge about the letters in their own names. *Journal of Experimental Child Psychology*, *70*, 97–116.
- Treiman, R., Cohen, J., Mulqueeny, K., Kessler, B., & Schechtman, S. (2007a). Young children's knowledge about printed names. *Child Development*, *78*, 1458–1471.
- Treiman, R., Levin, I., & Kessler, B. (2007b). Learning of letter names follows similar principles across languages: Evidence from Hebrew. *Journal of Experimental Child Psychology*, *96*, 87–106.
- Treiman, R., Tincoff, R., Rodriguez, K., Mouzaki, A., & Francis, D. J. (1998). The foundations of literacy: Learning the sounds of letters. *Child Development*, *69*, 1524–1540.
- Treiman, R., Weatherston, S., & Berch, D. (1994). The role of letter names in children's learning of phoneme-grapheme relations. *Applied Psycholinguistics*, *15*, 97–122.
- Turnbull, K. L. P., Bowles, R. P., Skibbe, L. E., Justice, L. M., & Wiggins, A. K. (2010). Theoretical explanations for preschoolers' lowercase alphabet knowledge. *Journal of Speech, Language, and Hearing Research*, *53*, 1757–1768.
- Worden, P. E., & Boettcher, W. (1990). Young children's acquisition of alphabet knowledge. *Journal of Reading Behavior*, *22*, 277–295.

Children's Literature Cited

- Fleming, D. (2006). *Alphabet under construction*. New York, NY: Henry Holt and Co.
- Geisel, T. S. (1991). *Dr. Seuss's ABC*. New York, NY: Random House.
- Johnson, S. (1995). *Alphabet city*. New York, NY: Puffin Books.