Rationale & Research

Word Warm-ups is a supplemental reading program intended for learners who need additional instruction and practice in phonics and support in fluency. Research-based findings in reading instruction and instructional design components provide the foundation for this program.

Reading Instruction Research

The Word Warm-ups program is designed to align with the reading research supporting:

- the essential role of phonemic awareness
- the effectiveness of explicit, systematic phonics-based instruction
- the need for explicit instruction in decoding multisyllabic words
- the importance of building automatic decoding skills[1]

Phonemic Awareness

Phonological awareness is the conceptual understanding of the units of oral language: individual sounds, onsets and rimes, syllables, and words. Phonemic awareness is a critical component of phonological awareness and represents the understanding that spoken words are made up of the smallest units of sound in a language, known as phonemes.

Research has found that phonemic awareness:

- is a strong predictor of future reading achievement[2]
- has a causal influence on the development of early literacy skills[3]
- does not develop naturally without modeling[4]

Additionally, research has found that early, code-focused reading intervention:

- significantly and positively impacts the development of phonemic awareness[5]
- does not require pre-existing knowledge or skill to be effective[6]
- does not vary in effectiveness at any point along a continuum of age or development[7]

It is therefore crucial that educators provide direct teaching of phonemic skills during early reading instruction and as part of any remedial teaching given to children with dyslexia, in addition to training letter-sound knowledge.

The Word Warm-ups intervention program teaches, reinforces, and provides practice with the phonemes of English in conjunction with instruction in the alphabetic code. This instruction is built into the program lessons and is also a part of the Phontastic practice activities in Word Warm-ups Live. For more comprehensive instruction that includes higher-order phonemic skills, see Read Naturally's supplemental programs, Funēmics and GATE: Reading Intervention for Small Groups.

Phonics

Phonics is "a system of teaching reading that builds on the alphabetic principle, a system of which a central component is the teaching of correspondences between individual letters and groups of letters and their pronunciations."[8] Decades of analyses and reports of current evidence for effective early reading instruction have universally found that early explicit, systematic phonics and phonological-awareness instruction prevents and remediates reading difficulties.[9] The report of the National Reading Panel from 2000 is the most influential exploration of the effectiveness of phonics instruction.[10] However, more recent analyses of rigorous studies have since confirmed that phonics instruction is an effective intervention for poor readers.[11]

Alphabet Knowledge

One outcome of early reading instruction is the development of readers' knowledge of the alphabet, including letter names and letter sounds. The insight that the sounds of English are represented by letter symbols is known as the alphabetic principle. Research has shown that this fundamental insight does not typically develop without explicit teaching.[12] However, meta-analyses find that domains of alphabet knowledge can be developed through specific instruction. The study of phonemes and graphemes is mutually beneficial, and findings suggest that instruction often yields greater effects when alphabet and phonological awareness are taught in tandem.[13] For this reason, Word Warm-ups provides explicit instruction, modeling, and practice with a combined emphasis on both sounds and letters/patterns throughout the program.

Systematic and Explicit Phonics Instruction

After completing a thorough meta-analysis of many well-designed studies, the National Reading Panel found "solid support for the conclusion that systematic phonics instruction makes a bigger contribution to children's growth in reading than alternative programs providing unsystematic or no phonics instruction."[14] The National Reading Panel also stated that "the hallmark of systematic phonics programs is that they delineate a planned, sequential set of phonic elements, and they teach these elements, explicitly and systematically."[15]

Word Warm-ups is a systematic program that explicitly teaches and applies phonics skills based on a combination of usefulness and difficulty. Word Warm-ups 1 reviews letter-sound correspondences and provides direct instruction in the blending of sounds to form one-syllable words. Word Warm-ups 2 continues sequential phonics instruction by providing more practice in applying phonics skills to decode two-syllable words. Word Warm-ups 3 reinforces phonics instruction by providing continuing practice in applying phonetic skills to read syllables in longer words.

Decoding Multisyllabic Words

The ability to decode single-syllable words does not necessarily transfer to reading multisyllabic words.[16] Yet students in grades five and above encounter thousands of unknown words each year,[17] and a large number of those words are multisyllabic.[18] Awareness of syllable patterns and the ability to break words into decodable parts (including prefixes and suffixes) have been shown to help students read unfamiliar multisyllabic words more easily.[19] Consequently, systematic and explicit instruction in decoding multisyllabic words is important.[20]

The lessons in Word Warm-ups 2 introduce the most common syllable patterns, prefixes, and suffixes in the English language. The lessons in Word Warm-ups 3 teach the pronunciation of 30 prefixes and 40 suffixes, a strategy for decoding open and closed syllables, and the schwa (/ə/) sound in multisyllabic words. In both levels, students apply phonics skills to decode each syllable. They hear how each part of a word is phonetically pronounced and then how the word is correctly pronounced when the parts are combined.

Fluency

Fluency is the ability to read with accuracy, at an appropriate speed, and using proper expression when reading aloud. Fluency is essential to reading because the ability to decode automatically allows students to focus on the meaning of the text.[21] Research evidence supports the following findings:

- Fluency highly correlates with reading comprehension.[22]
- Fluency strongly predicts later reading achievement.[23]
- Fluency causally contributes to improved comprehension.[24]

Automatic Decoding

To read text fluently, a student must be able to decode words accurately and automatically. Most phonics programs teach students to decode accurately; however, learning phonics does not guarantee that students are able to decode words automatically. Often students who can decode words accurately sound them out slowly. This slow decoding prevents them from reading fluently. In order to become fluent readers, students need to learn to decode unknown words automatically.

Orthographic Mapping

Along with gaining automaticity with phonological decoding, contemporary models of proficient reading also identify the importance of developing a direct pathway from print to meaning.[25] Given multiple exposures to a word, a reader maps a word's spelling onto its meaning(s) through a process called orthographic mapping.[26] These learned words become sight words and allow the efficient word recognition necessary for fluent reading.

In Word Warm-ups, students practice decoding words with the featured phonics or syllable patterns until they can recognize them easily and read the words rapidly. Then, to apply their automatic decoding skills, the students read a list of challenge words that contain the featured patterns, as well as a story that uses several words with the featured patterns.

Instructional Design Research

In order to determine which strategies increase the achievement of students with diverse learning needs, researchers have studied the power of goals and motivation. Researchers have also studied intervention methods and the effectiveness of their various instructional components.

Goals and Motivation

By communicating goals and expectations, an instructor can increase students' academic achievement.[27] In addition, providing students with feedback on their progress toward short- and long-term goals has been shown to increase student performance.[28] When students are given specific goals, they demonstrate significantly higher self-efficacy.[29]

In Word Warm-ups, students know their goals. They must decode words or read stories with the featured phonics or syllable pattern. They must perform these tasks accurately and rapidly enough to meet a goal rate. While working in the program, students graph their progress on each exercise and use those graphs to track their own personal improvement.

Instructional Components

Swanson and colleagues conducted an extensive meta-analysis of 180 intervention studies and identified several instructional components that demonstrated effectiveness with students.[30] The lessons in Word Warm-ups incorporate many of these instructional components, including the following:

- attention to sequencing
- segmentation
- control of task difficulty
- modeling
- practice and repetition
- review

Attention to Sequencing

Instruction that includes breaking down tasks and sequencing short activities positively affects student outcomes.[31] Therefore, it is important to teach students how to read words beginning with the sounds of the letters and then teach them how to blend those letters into words.[32]

In Word Warm-ups, skills are taught in a series of short, carefully sequenced activities. The process of decoding words is broken down into specific tasks. First, students are told to look at the word and listen for the sounds of the letters and letter combinations that form the featured phonics or syllable pattern. This task promotes phonemic awareness and raises the students' awareness of the pattern. Next, through explanation and modeling, students are taught how to use the phonics or syllable patterns to blend words. Then, they read the words independently until they are able to read them well.

Segmentation

Segmentation of skills improves student achievement.[33] Segmentation is breaking apart the targeted skill into small units and then synthesizing the units back into the targeted skill. One example of segmentation in the teaching of reading is breaking the code into its phonological and alphabetic parts and then connecting these parts to reading words and text.[34]

In Word Warm-ups, students learn to read words that feature the letters, sounds, and syllables they are taught. Then, they apply their newly acquired pre-requisite skills to the act of reading word lists with increasing automaticity. Finally, they read stories containing words with the featured patterns.

Control of Task Difficulty

Controlling the difficulty of tasks—that is, beginning with simple tasks and then moving on to more complex ones—supports students during initial learning phases and promotes independence as students become more capable.[35] The use of cues and prompts in diminishing frequency provides the support students need as they acquire difficult skills.

Word Warm-ups is designed with great attention to controlling difficulty. Word Warm-ups 1 and 2, for example, provide picture cues when concepts are introduced but then omit the pictures for later tasks when the students are more proficient. Similarly, students first practice reading the word lists down the columns, because the columns consist of words with similar sounds and/or syllable patterns to help students decode more easily. Students then practice reading the words across the rows, which provides the opportunity to decode the words without the support of patterns. Additionally, in Word Warm-ups 2, the syllables are separated by spaces in the exercises that teach the patterns, but those spaces are eliminated in subsequent exercises.

Modeling

Modeling, along with carefully explaining the steps required to do a task, helps students correctly perform the task. It also increases the likelihood that students will perform the task independently later.[36] When teaching students to read, the steps for reading words must be made conspicuous by modeling the strategy before students practice on their own.[37]

In Word Warm-ups, the audio for each lesson exercise carefully explains the featured pattern for the exercise. Then the audio slowly models the sounds of the pattern and then demonstrates how to blend the sounds or syllables to read example words. Later, the audio models the blending of each word in the lesson to ensure that the students will read and practice the words correctly.

Practice and Repetition

Intuitively, we know that practice helps us become better at many things we do. Research supports this notion, indicating that repeated practice is an effective and efficient way of achieving word reading skills both in and out of connected text reading.[38]

In Word Warm-ups, students practice decoding words with the featured phonics or syllable patterns until they are able to recognize the patterns easily and read the words rapidly. The students then practice reading a story that contains several words with the featured patterns in order to build reading fluency. In both the word list exercises and story exercises, students practice repeatedly until they reach their goal rate. This process increases their efficiency at the new skill.

Review

Regularly reviewing skills is an effective instructional tool.[39] However, review should be more than just rote rehearsal. Reviews that are designed to combine newly acquired skills with skills taught less recently extend the reader's understanding.[40]

Word Warm-ups includes regular reviews of skills after each section of new skills is introduced and practiced. In addition, challenge exercises at the end of each section require students to apply their newly acquired skills while reviewing skills previously mastered. They must read unfamiliar words that contain both new and mastered phonics or syllable patterns.

Endnotes

1 Foorman et al., 2016.

2 Share, Jorm, Maclean, and Matthews (1984) found that student achievement on a phoneme-segmentation measure at the beginning of kindergarten was the best predictor of end of kindergarten (0.66) and end of first grade (0.62) reading achievement among many factors analyzed. Melby-Lervåg, Lyster, and Hulme (2012) found phonemic awareness to be a better predictor of future word reading than phonological measures of rime awareness and verbal short-term memory.

3 Hulme, Bowyer-Crane, Carroll, Duff, & Snowling, 2012.

4 Unlike learning to speak, which is a developmental process that occurs naturally through exposure, reading requires explicit instruction. Phonemic awareness is, perhaps, the earliest threshold ability that must be taught. Morais and colleagues' study of illiterate adults found that they were able to discriminate speech sounds, play with syllables and rhymes, and recognize words as having the same endings; however, they did not perceive and could not identify or manipulate the smallest units of sound because they had never been taught (Morais, Bertelson, Cary, & Alegria, 1986; Morais, Cary, Alegria, & Bertelson, 1979).

5 The National Early Literacy Panel analysis of 83 high-quality intervention studies with children in preschool and kindergarten found that code-focused interventions demonstrate "strong, positive, and statistically significant impacts…on children's skills in the domains of [phonemic awareness, alphabet knowledge,] oral language, reading, and spelling" (2008, p. 112).

6 National Early Literacy Panel, 2008, p. 118.

7 National Early Literacy Panel, 2008, p. 119.

8 Adams, 1990, p. 50.

9 Adams, 1990; Anderson, Hiebert, Scott, & Wilkinson, 1985; National Early Literacy Panel, 2008; National Institute of Child Health and Human Development, 2000; Snow, Burns, & Griffin, 1998.

10 National Institute of Child Health and Human Development, 2000.

11 Galuschka, Ise, Krick, and Schulte-Körne's study (2014) analyzed treatment approaches for students with disabilities and found that "phonics instruction is not only the most frequently investigated treatment approach, but also the only approach whose efficacy on reading and spelling performance in children and adolescents with reading disabilities is statistically confirmed." See also McArthur et al., 2018.

12 Castles, Rastle, & Nation, 2018.

13 Piasta & Wagner, 2010.

14 National Institute of Child Health and Human Development, 2000, p. 2-92.

15 National Institute of Child Health and Human Development, 2000, p. 2-99.

16 Just & Carpenter, 1987.

17 Nagy & Anderson, 1984.

18 Cunningham, 1998.

19 Bhattacharya & Ehri, 2004; Shefelbine, 1990.

20 Kirby & Bowers, 2017.

21 LaBerge & Samuels, 1974.

22 L. Fuchs, D. Fuchs, Hosp, and Jenkins (2001) summarize research that found oral reading fluency correlates (.91) to comprehension even more highly than more direct comprehension measures (i.e., question answering, .82; recall, .70; cloze, .72).

23 Reschly, Busch, Betts, Deno, and Long's meta-analysis (2009) of correlational evidence from 41 studies found significant, strong overall correlation (.67) among measures of fluency and prediction on state-specific and national tests. These findings were consistent across grades 1–5 and when tests were administered individually or by group.

24 For example, Price, Meisinger, Louwerse, and D'Mello (2015) found text reading fluency (oral and silent) to account for 47% of variance in fourth-grade students' comprehension.

25 For more information on models of reading, see Stai, 2020.

26 Ehri, 2014.

27 Morgan, Sideridis, and Hua's meta-analysis (2011) of 44 studies identified that students participating in interventions with goal-setting and feedback had higher levels of fluency (measured in words correct per minute) than students receiving any of the other six interventions analyzed.

28 Morgan et al., 2011. See also Conte and Hintze, 2000.

29 Schunk & Rice, 1988.

30 Swanson, Hoskyn, & Lee, 1999.

31 Swanson et al., 1999.

32 Kame'enui, Carnine, Dixon, Simmons, & Coyne, 2002.

33 Swanson et al., 1999.

34 Kame'enui et al., 2002.

35 Kame'enui et al., 2002; Swanson et al., 1999.

36 Swanson et al., 1999.

37 Kame'enui et al., 2002.

38 Swanson et al., 1999.

39 Swanson et al., 1999.

40 Kame'enui et al., 2002.

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