The Role of Educator Preparation Programs in Preparing Teachers in

THE SCIENCE OF READING

75TH Anniversary | AACTE

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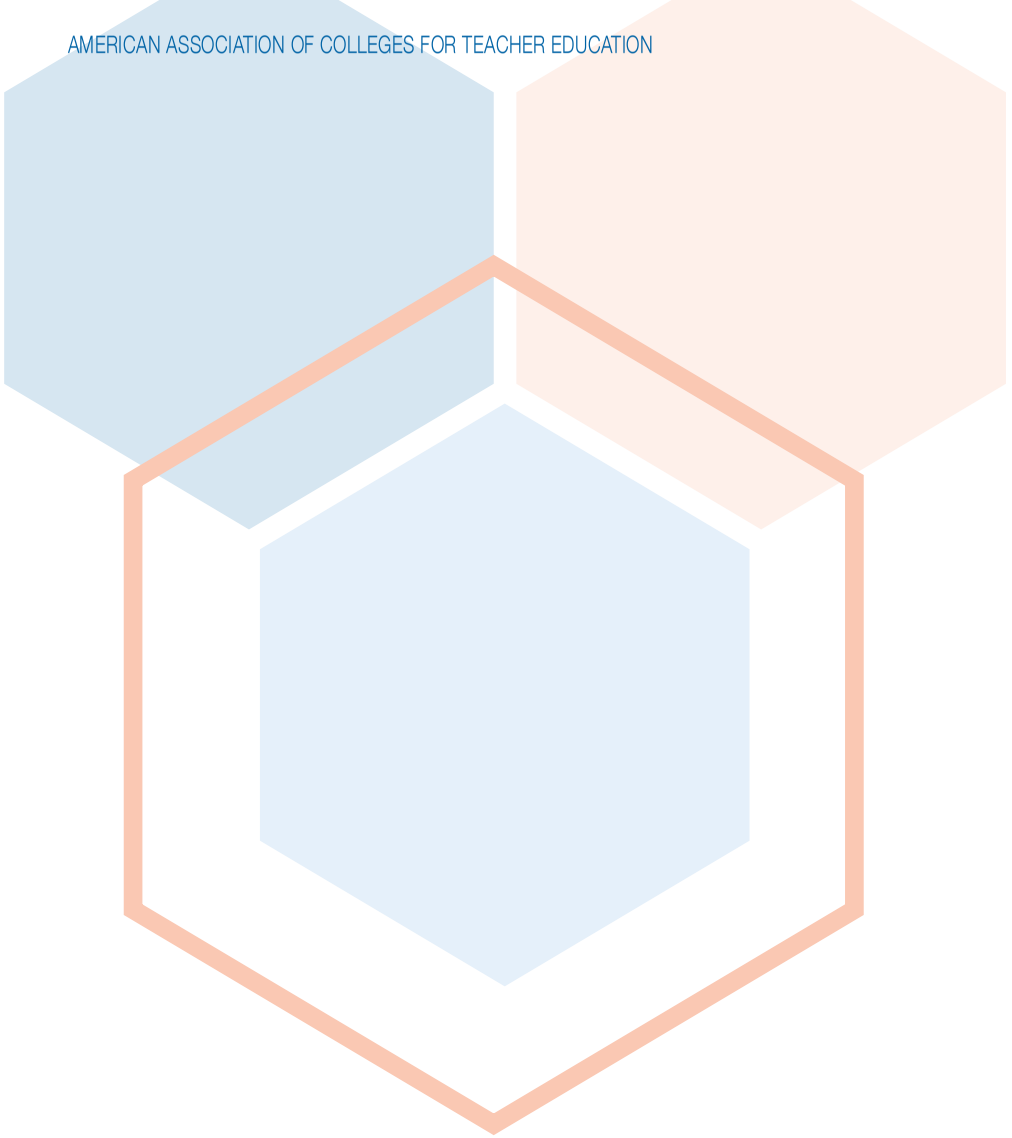

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INTRODUCTION

The "science of reading" has garnered enormous attention among educators and the general public over the past few years. Numerous articles, podcasts, and other popular media posit that too many kids are failing to learn to read proficiently and that too many teachers lack the knowledge and skills to teach reading effectively.

Recent National Assessment of Educational Progress scores reveal that only 33% of our nation's 4th-grade students read proficiently (NCES, 2022). The reading curricula and methods of instruction most commonly used in schools are based on a 'balanced literacy' approach. Most of the programs adopted by districts have little or no empirical support, so these methods have received much of the blame for dismal student outcomes, along with the assertion that teachers are inadequately prepared to provide effective reading instruction.

In the fall of 2022, a six-part podcast by journalist Emily Hanford targeted the criticism on these methods of beginning reading instruction that are widely adopted in the United States and commonly taught in colleges of education. The podcast, "Sold a Story," includes commentary from numerous teachers lamenting the poor quality of their preparation to teach reading. Although this podcast focused on methods for beginning reading instruction, instruction for older students has also been criticized. The blame for the lack of teacher expertise in effective strategies for teaching reading has fallen squarely on the shoulders of educator preparation programs.

Through the power of social media, the message has spread far and wide that colleges of education in the United States have failed miserably in their preparation of reading teachers. In fact, one Facebook group called "Science of Reading-What I Should Have Learned in College" has approximately 200,000 members. This group has spawned smaller, local versions in all 50 states, along with several more specialized groups focusing on specific grade levels or areas of instruction. In the aftermath of the "Sold a Story" podcast, several opinion pieces were published as letters from concerned parties—both for and against Hanford's assertions. In addition, "open letters" have been sent to college deans, demanding either refunds for inadequate preparation or evidence of change for the sake of future generations of teachers (see, for example, Pondiscio, 2018). Colleges of education feel pressured, and many programs have begun to examine their coursework and field experiences to determine whether or to what extent the criticisms are warranted.

What is purported to be missing from teacher preparation programs is course content and practical experience in the "science of reading." That term alone has generated much controversy and misunderstanding, along with many opinions about what it means (NEPC, 2020; The Reading League, 2022). So, it is essential to consider the question, "what *is* the science of reading?"

WHAT IS THE SCIENCE OF READING?

There are many misconceptions about what the science of reading is. Most of those are assumptions that it is a particular approach to or method of instruction. Many educators erroneously equate the science of reading with phonics instruction. Although scientific evidence certainly supports the use of explicit, systematic phonics instruction, the claim that it is *only* phonics is usually employed as a specious argument by those who are opposed to the use of rigorous research standards.

In its most widely accepted interpretation, the science of reading can be defined as the accumulated evidence from a range of scholarly fields that contributes to our understanding of reading process, reading development, and reading pedagogy. The fields of research most often mentioned as contributors include psychology, linguistics, neuroscience, and of course, education.

- **Psychology.** Research from cognitive, developmental, and school psychology has contributed to the understanding of neural networks and learning processes, along with the role of specific conditions for optimizing learning. This research has demonstrated that mental processes such as attention, memory, perception, and problem-solving, are all important in reading. Psychology research has shown, for example, practicing related skills, such as the correspondences between sounds and letters, interleaved practice, distributed over time, promotes better retention than blocked or massed practice (Brunmair & Richter, 2019; Jones & Reutzel, 2012).
- **Linguistics.** Research from the field of linguistics has added to the understanding of the elements of language that contribute to proficient reading, including phonology and phonetics, orthography, morphology, semantics, and syntax. The findings from linguistics research have demonstrated which linguistic knowledge and skills are necessary for reading. This research has also helped define factors that need consideration in developing a sequence of instruction. Linguistics research has shown, for example, the skill in segmenting phonemes—the smallest units of spoken language—is necessary for developing decoding and encoding skills (Gleitman & Rozin, 1977).
- **Neuroscience.** Brain research has revealed much in recent decades about what is happening in the brains of readers, including both typically developing and dyslexic brains. Although these findings have few direct implications for teaching, knowledge about how the brain processes written language is thought to be foundational for reading teachers. Neuroscience research has shown, for example, that reading acquisition brings about observable changes in the functions of core brain systems (Dehaene et al., 2014).
- **Education.** The role of education research has been to expand understanding of instructional methods and systems for organizing, delivering, and managing assessment and instruction. This body of research has included such topics as the effects of explicit instruction, homogeneous grouping, and multi-tiered systems of support. Education researchers have also explored social issues that affect students, teachers, and their relationships, such as poverty and cultural and implicit bias.

To generate consensus in the field, The Reading League organized a coalition of researchers and practitioners to generate a definition:

> The science of reading is a vast, interdisciplinary body of scientifically-based research about reading and issues related to reading and writing. This research has been conducted over the last five decades across the world, and it is derived from thousands of studies conducted in multiple languages. The science of reading has culminated in a preponderance of evidence to inform how proficient reading and writing develop; why some have difficulty; and how we can most effectively assess and teach and, therefore, improve student outcomes through prevention of and intervention for reading difficulties (The Reading League, 2022, p. 6).

Although this conceptualization of the science of reading is widespread among advocates, many other characterizations exist, as well as outright rejection of the notion of scientific consensus related to reading. For example, in an interview with Emily Hanford, Kenneth Goodman dismissed concepts such as the existence of dyslexia or scientific evidence to support it, famously saying, "My science is different." Similarly, Lucy Calkins, whose programs were highlighted in "Sold a Story," wrote a piece entitled "No One Gets to Own the Term 'The Science of Reading.'"

Much of the initial attention to the science of reading was spurred on by advocacy, especially by parents concerned about the quality of the reading instruction and intervention their children were receiving. One grassroots group, Decoding Dyslexia, has been particularly influential. Decoding Dyslexia started with a small group of parents and grew to a loosely organized network of chapters in every state. The focus of this group and others has been on improving reading instruction and intervention through national, state, and local policy (Youman & Mather, 2018).

Much of the resulting legislation and policy focuses on teachers' preparation and practices in reading instruction and intervention. For example, the Colorado Reading to Ensure Academic Development (READ) Act provides detailed requirements for the preparation of teachers. In Kentucky, House Bill 187 (2018) states that teachers should be able to recognize characteristics of dyslexia and "use structured, multisensory approaches to teach and assist students to develop language and reading skills." Legislation in Florida requires teacher preparation programs to include "explicit, systematic, and sequential approaches to teaching phonemic awareness, phonics, vocabulary, fluency, text comprehension, and multisensory strategies" (SS 1004.04 (2)(b)(3)). Some states have gone so far as to require specific training or instructional approaches, such as Orton-Gillingham (Stevens et al., 2021). Requirements such as these have made it imperative for teacher educators to be knowledgeable about national, state, and local policies related to reading instruction.

EFFECTIVE READING INSTRUCTION

Reading is perhaps the most essential skill children learn in school. A child's reading proficiency level in early grades is predictive of later academic, social, and economic outcomes. The long-term effects of reading difficulties can be devastating, as reading failure often leads to negative consequences, including grade retention, dropout, and limited employment opportunities (Sabatini, 2015). Therefore, preparing teachers with effective methods of reading instruction and intervention for struggling students is essential. When it comes to preparing teachers for reading instruction, we need to consider what children need to learn and what teachers need to be prepared to teach.

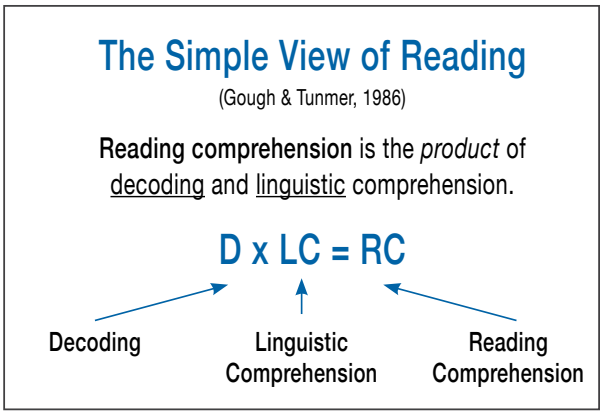

Figure 1: The Simple View of Reading (Gough & Tunmer, 1986)

The simple view of reading (Gough & Tunmer, 1986; Hoover & Gough, 1990; Hoover & Tunmer, 2018) posits that reading comprehension is the product of decoding and linguistic comprehension. The theory is depicted as a mathematical formula to illustrate the importance of each factor. In this formula, both elements are necessary and equally important for reading comprehension. Each value can range from 0 (no skill) to 1 (perfect skill). This means that no matter how well an individual understands and uses spoken language, the capacity to read words accurately and automatically is essential for overall reading proficiency. Similarly, a proficient decoder cannot achieve reading comprehension without adequately understanding spoken language. The simple view of reading has been found to explain almost all of the variance in reading comprehension (Catts et al., 2006; Lonigan et al., 2018).

Scarborough (2001) elaborated on this basic concept through her rope metaphor by suggesting that word recognition comprises three specific "strands": phonological awareness, decoding, and sight recognition. In Scarborough's rope metaphor, as these word recognition strands develop, they become increasingly automatic. On the language comprehension side of the rope metaphor, Scarborough explains the importance of background knowledge, vocabulary, knowledge of language structures, verbal reasoning, and literacy knowledge. As these strands of language comprehension develop, they become increasingly strategic. The result of the effective development of all the strands is skilled reading.

These related conceptual frameworks are helpful for teachers to understand the reading process and for teacher educators to organize the content and implementation of preparation programs. There have been countless studies of what constitutes effective reading instruction. Rather than attempting to fully synthesize this body of research, we will simply identify key content teachers need to understand and the role of educator preparation programs in equipping teachers with the necessary knowledge and skills to teach reading. We have organized this content into two main sections: what to teach and how to teach.

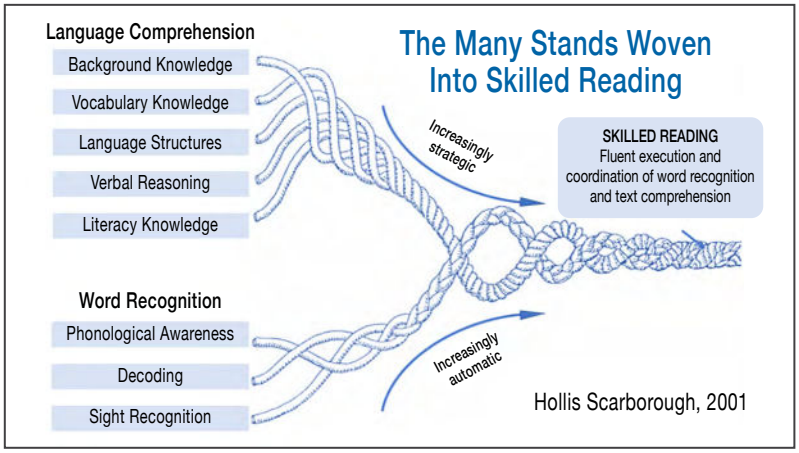

Figure 2: Reading Rope (Scarborough, 2001)

WHAT TO TEACH

The research on the essential elements of reading instruction is vast (Castles et al., 2018; National Reading Panel, 2000). Although there is some disagreement, the vast majority of researchers agree that a strong foundation in the alphabetic code and a well-developed understanding of spoken language are essential. When it comes to what to teach in elementary reading instruction, the following specific areas are considered particularly significant.

Oral language and vocabulary. Understanding spoken language forms the foundation for understanding written language. Vocabulary knowledge has long been recognized as an excellent predictor of both later reading comprehension (Davis, 1972; Thorndike, 1917) and overall school achievement (Beck et al., 2008). A child's command of English syntax and semantics will contribute directly to reading comprehension (Hagtvet, 2003). Vocabulary can be most effectively developed through explicit instruction (Beck et al., 2008), but promoting incidental learning of word meanings is also vital for optimal vocabulary growth (Lane & Arriaza-Allen, 2010).

Letters and sounds. Literacy requires one to access messages conveyed via print, requiring coordination of knowledge, skills, and processes. This includes awareness of letters, sounds, and the skills necessary to connect these. A child must develop an understanding of the alphabet, which includes familiarity with letter shapes, names, and sounds, as measured by recognition and production tasks (Piasta & Wagner, 2010). Children also must develop an awareness of phonemes, the smallest unit of sound in spoken language, and the physical act used to produce those sounds.

Decoding and encoding. To learn to read an alphabetic language such as English, one must develop an understanding of the alphabetic principle—that fundamental insight that letters and sounds work together in systematic ways to form words (Adams, 1990; Snow et al., 1998). Most children need explicit phonics instruction to facilitate their ability to break the alphabetic code (Beck & Juel, 1995; Ehri, 2020, 2022). Word study goes beyond teaching basic letter-sound correspondences. Instruction in encoding has been shown to improve both encoding and decoding skills (Moats, 2006; Weiser & Mathes, 2011). To assist in decoding and encoding multisyllabic words, it may be beneficial to understand syllable types and syllable division patterns (Carreker, 2011a). Morphemic analysis supports the advancement of students' decoding and encoding skills from one-syllable base words to bases with affixes to other derivatives and multisyllabic words (Carreker, 2011a, 2011b). Knowing the etymology or origin of English words also helps with both decoding skill and vocabulary development (Henry, 2011). Instruction in these elements facilitates a mental process called orthographic mapping, which is the "formation of letter-sound connections to bond the spellings, pronunciations, and meanings of specific words in memory" (Ehri, 2014).

Fluency. Reading fluency, defined as a combination of word reading accuracy, automaticity, and prosody, is vital to reading proficiency (Hudson et al., 2005) because there is a very strong correlation between fluency and comprehension (e.g., Rasinski et al., 2011). Word-level automaticity, or effortless recognition of individual words, is essential for reading proficiency (Ehri, 2014, 2020). Text-level automaticity, or oral reading fluency, is most effectively developed through extensive practice with connected text (Hudson et al., 2020). Prosodic reading is both an indicator of and an aid to comprehension (Kuhn & Schwanenflugel, 2019).

Comprehension. As previously mentioned, the simple view of reading suggests that reading comprehension is the result of being able to both read and understand words and text. Related factors include the reader's background knowledge of the text's content (Wexler, 2020), understanding of the text's structure (Kendeou & van den Broek, 2007), and motivation (Wigfield et al., 2016). Improving comprehension requires developing knowledge, vocabulary, and proficiency in inference generation and comprehension monitoring (Elleman & Oslund, 2019).

HOW TO TEACH

Teaching reading requires carefully introducing concepts and applying those concepts in connected text. Development of the knowledge and skills needed for proficient reading requires effective instruction. Several key elements of instruction are considered especially important to promote efficient learning.

Effective reading instruction is explicit and systematic (McLeskey et al., 2017). Explicit instruction is clear and direct, unambiguous, never assuming mastery and never leaving learning to chance (Archer & Hughes, 2011). Systematic instruction is logically sequenced to build on prior knowledge, ensuring prerequisite skills are acquired before new skills are introduced, always connecting the new to the known, and moving from easier to more challenging skills and strategies (Earle & Sayeski, 2017).

Effective reading instruction should also include several critical instructional strategies that increase the likelihood of student success, such as: (a) providing ample opportunities to respond (MacSuga-Gage & Gage, 2015; Sutherland & Wehby, 2001), (b) reinforcement of correct responses with behavior-specific praise (Royer et al., 2019), and (c) correction of incorrect responses with immediate and specific feedback (Archer & Hughes, 2011; Black & Wiliam, 1998).

For struggling readers, instruction should also be more intensive (Mellard et al., 2010). Intensive instruction is generally delivered in small groups, but it can be delivered individually. When increasing intensity, the most important goal is increasing the amount of practice or opportunities to respond.

EFFECTIVE TEACHER PREPARATION IN READING

Enhanced teacher education has been identified as a crucial strategy for improving students' reading instruction and reading outcomes (Hoffman et al., 2005; Snow et al., 1998). In addition to in-depth understanding of reading and the reading process, improved reading instruction also depends on teachers' knowledge of evidence-based instructional practices that support the delivery of effective teaching. Teacher knowledge and instructional expertise strongly impact student reading achievement (Lyon & Weiser, 2009).

Although studies comparing traditional and alternative programs have yielded mixed results overall, novice teachers who participated in traditional teacher preparation programs within institutions of higher education (IHE) have exhibited a higher self-efficacy in reading than teachers who have non-IHE alternative forms of preparation (Raymond-West & Rangel, 2020). In a study of reading teacher preparation, Hoffman and colleagues (2005) found that participation in a high-quality teacher preparation program positively influenced teachers' adoption of effective teaching practices. After completing teacher preparation programs, teacher candidates should be able to generalize teaching skills across time and settings to meet the needs of all learners (Gersten et al., 1995; Scheeler, 2008; Vaughn et al., 2000).

Snow and colleagues (2005) conceptualized a progressive differentiation model of teacher knowledge that consists of five levels: (1) declarative knowledge, (2) situated, can-do procedural knowledge, (3) stable procedural knowledge, (4) expert, adaptive knowledge, and (5) reflective, organized, analyzed knowledge. This model assumes that teacher knowledge constantly evolves and adapts to changes in experience and contexts.

Conceptualizing teacher knowledge from a developmental perspective aligns with views of knowledge in other professions, such as medicine. Preservice teachers rely more upon declarative knowledge than novice or master teachers. The authors caution that these levels "should not be thought of as 'stages' separated from one another by sharp discontinuities" (p. 9). Instead, the various levels are more likely to be present at different points in a teacher's development.

The role of initial teacher preparation in literacy is to develop solid declarative knowledge through coursework and guide candidates in their development of situated, can-do procedural knowledge during field experiences. Teacher preparation should provide learning experiences that support teacher candidates' knowledge-building within different instructional contexts. To become effective reading teachers, teacher candidates need a foundation of literacy development's theoretical and scientific underpinnings, instruction in reading content, and practicum experiences teaching reading (Brady & Moats, 1997). Teachers acquire and maintain new practices most successfully when they are provided with systematic instruction, multiple opportunities to practice (Ericsson et al., 1993; Willingham, 2004), and feedback that is immediate, positive, corrective, and specific (Scheeler et al., 2004).

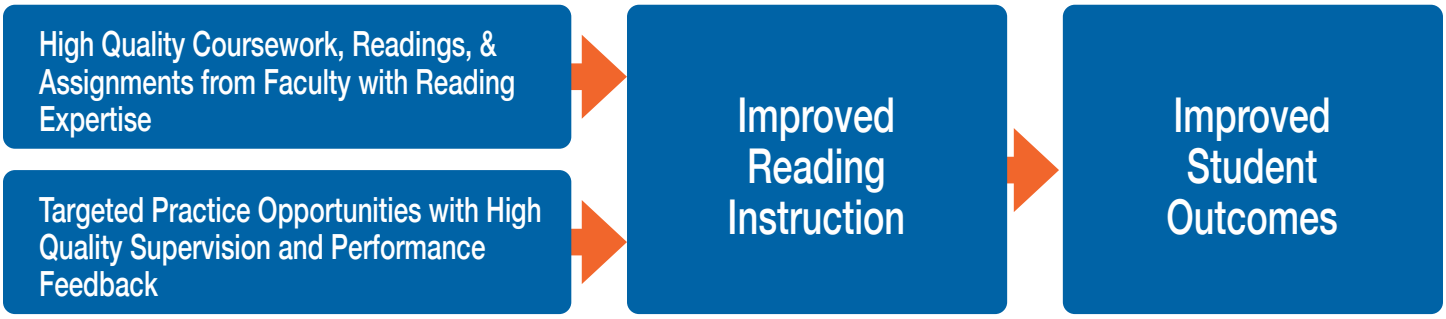

Figure 3: Theory of Change for Improved Student Reading Outcomes

VOICES FROM THE FIELD

To learn about the preparation that teachers receive in the educator preparation programs to provide reading instruction, we sought the perspectives of current reading teacher educators. We conducted a virtual focus group with 15 faculty teacher educators from the United States and Canada. Participants were recruited through an announcement posted on AACTE's EdPrep Matters Blog, and they represented a wide range of public and private colleges and universities. Their institutions varied in size, level of preparation (i.e., undergraduate and graduate), and geographical locations.

We asked participants to share their definitions of the science of reading and to rate their own knowledge of the science. Additionally, we asked them to rate their institution's interest in and support of teacher knowledge about the science of reading and to share what they could about the discussions on the topic in their states or at their institutions. Finally, we asked them to describe their program's approach to teacher preparation in reading, including both coursework and field experiences. Their responses centered around three main themes: context, developing expertise, and refining programs.

Context. The context in which these teacher educators worked profoundly influenced their responses. For example, in some settings, state legislation and local policies prompted and shaped the conversation about the science of reading. In other settings, the impetus for the discussion came from within the institution or from their graduates. In still others, the focus began with parents or advocacy groups dissatisfied with the instruction children received.

Some participants were operating in settings with a sense of urgency about attending to the science of reading. One participant characterized this urgency as "hysteria," while others saw it necessary to propel programs forward. For some, state requirements had their programs "scrambling" to redesign coursework. Others were in settings where attention to the science of reading had been largely ignored or, in some cases, actively opposed. Some opposition came from colleagues within participants' institutions, while others, came from local districts or state-level teacher organizations.

Several participants expressed concern about the language they and others used to communicate about the science of reading. They suggested that they tread carefully and use respectful language: "we can't shove it down people's throats." For some, the term "science of reading" was problematic due to all the controversy and misconceptions associated with it. One participant avoided using the term "because if we want to make true impacting change in our state, we can't shove it down people's throats. Instead, we have to think about the stages of behavioral change and how it takes time for people. Everyone might be at a different stage, and so we're actually encouraging and welcoming debate." Several agreed that using the term "evidence-based practices" was more palatable to people in their area.

Developing expertise. For several participants, challenges had arisen based on their own need for developing expertise in the science of reading. A common thread among several participants was that their preparation as reading teachers did not align with the science of reading. One participant shared, "as a balanced literacy person, I taught phonics incidentally, and I think the idea of teaching it in a really systematic and sequential way is the critical piece that I was missing as a teacher and that I think many of our classroom teachers are missing."

So, despite their efforts to develop knowledge to impart to their teacher candidates, their lack of experience with evidence-based practices made it difficult to guide novices. Participants from small teacher preparation programs agreed that challenges based on their own lack of expertise were compounded because so much of the responsibility for program changes rested on their shoulders: "I kind of feel like I'm by myself with it, especially redesigning courses and trying to figure things out—and I'm definitely not an expert yet."

Several participants expressed concern about the expertise—or lack thereof—among their colleagues. This was a particularly pressing concern at institutions that relied heavily on adjunct faculty or graduate assistants to teach courses. As one participant expressed, "we try to meet and talk and have some standardization. I think most people are on board, but I would say there's still quite a mix in terms of even who's teaching the literacy classes." This concern was echoed by participants whose institutions are located in areas where the local schools have not adopted evidence-based practices. The expertise of teachers and field supervisors was noted as a particularly pressing issue. One participant emphasized the importance of having "cooperating teachers, reading specialists, field supervisors, that can really have triangulated discussions around best practice in the area of literacy instruction."

Refining programs. As participants described the modifications and refinements being made to their teacher preparation programs, the conversation centered on redesigning coursework and aligning field experiences. The key elements they noted needing improvement were updating course content, alignment with standards, content delivery consistency, and reading instruction quality in field placements. Some expressed concern that, although changes were being made, there wasn't sufficient "evaluation of the current status of reading instruction ... to determine the extent to which teachers are following this framework of science of reading and how well that's happening."

New or refined coursework is being developed, implemented, and evaluated in many programs. Systematic evaluation of new coursework is essential because "teacher prep programs have to prove that they are teaching the science of reading." One participant explained, "we piloted [the course] in the fall and we did another pilot in the spring, and then we're going to reconvene and talk about where our students are, what their reactions were to it."

Participants discussed the content of newly developed coursework that included a heavier emphasis on phonological awareness and phonics and a new focus on language structures, fluency, vocabulary, and comprehension. Several participants reported including content related to neuroscience and how the brain learns to read. Finally, participants discussed the importance of effective instructional practices.

Consistent delivery of new content is a challenge experienced by many programs. Much of this was related to the widely varying degrees of expertise among faculty and adjuncts. Still, as one participant stressed, "standardizing, building a common language amongst faculty is so important, to kind of make sure we're delivering that consistent message." Online course delivery has contributed to the consistency within some programs. Inherent problems associated with hiring adjuncts are minimized when faculty members with substantial expertise design the online content.

Several participants expressed concern about the practices teacher candidates encounter during field experiences, specifically field experiences where evidence-based practices were not being used in the classroom. For some, despite their best efforts to demonstrate effective practices in coursework, "when they went out in schools, they couldn't see it." For others, evidence-based practices are becoming more common. As one participant shared, "there's been a definite shift in thinking, a shift in what I'm seeing in the classroom." Another explained, "When I first started teaching college courses in literacy, about 15 years ago, there was definitely a mismatch from what I was telling them and what they were experiencing in the field, and now it's starting to align more."

Relying on the program's own graduates to serve as mentor teachers has been a successful strategy at some institutions, where "many of the teachers that are at that school have come through our program" and "graduates are there and they are doing the kinds of best practices that we have taught them to do." Participants suggested that "knowing that those individuals have had the kind of instruction that allows for solid reading and writing instruction" ensures that teacher candidates have strong field experiences.

RECOMMENDATIONS FOR EDUCATOR PREPARATION PROGRAMS

The research literature about effective reading instruction and intervention and effective teacher preparation can inform teacher education practices. Using this knowledge base and input from teacher educators, we have generated four recommendations for educator preparation programs on the preparation of teachers to deliver effective reading instruction.

RECOMMENDATION 1: ENSURE TEACHER PREPARATION FACULTY HAVE UP-TO-DATE EXPERTISE IN READING DEVELOPMENT AND INSTRUCTION.

Quality teacher education relies on knowledgeable and skilled teacher educators, yet teacher educators often feel unprepared for their role (Goodwin et al., 2014). Although some education faculty may have a strong foundation in theory or research, bridging the gap between theory and practice remains challenging for many (Loughran, 2011, 2014). Teacher knowledge is significantly related to student outcomes (Lane et al., 2009; Piasta et al., 2009). However, results of surveys of teachers' knowledge about reading have shown significant weaknesses (Bos et al., 2001; McCutchen et al., 2009; Moats, 1994; Spear-Swerling & Brucker, 2004), and poor teacher preparation has been suggested as a major cause (Brady & Moats, 1997). Performance patterns in assessing teacher educators' reading knowledge have been found to mirror those of their respective teacher candidates (Binks-Cantrell et al., 2012).

Ensuring teacher educators (i.e., full-time faculty, adjunct faculty, and graduate assistants) who teach reading courses and supervise reading-focused field experiences hold sufficient expertise in reading seems to be a matter of common sense. One cannot develop expertise in others if one does not possess that expertise. Fortunately, teacher preparation programs significantly impact the development of reading expertise, and programs, where candidates apply their knowledge and skills under expert guidance, produced the largest gains (Hudson et al., 2021).

RECOMMENDATION 2: ENSURE TEACHER CANDIDATES DEVELOP READING CONTENT KNOWLEDGE.

Shulman (1986) characterized content knowledge as the "missing paradigm" of teacher education. He argued that high-quality instruction entails advanced professional knowledge plus general teaching strategies, and that teachers with advanced content knowledge can transform that knowledge into their instructional practices. Teacher educators should develop teacher candidates' declarative knowledge in reading. For example, a teacher with declarative knowledge knows that phonemic awareness is the most sophisticated subcategory of phonological awareness. This declarative reading content knowledge is developed through carefully designed coursework.

Teacher candidates should be presented with learning experiences that develop reading content knowledge through class lectures and discussions, readings, and assignments that allow them to engage with specific concepts. Teacher candidates should also be presented with tools that support their learning throughout a course, including guided notes for class lectures, teaching examples (through live demonstrations or videos), and ongoing learning checks.

RECOMMENDATION 3: ENSURE TEACHER CANDIDATES DEVELOP PEDAGOGICAL CONTENT KNOWLEDGE.

Teacher educators should also develop teacher candidates' situated, can-do procedural knowledge. Teachers with this ability level know how to enact declarative knowledge in extremely simple or scaffolded situations. Creating this type of procedural knowledge can be accomplished through coursework assignments that target the application of declarative knowledge.

Teacher candidates should be presented with learning experiences that target the application of knowledge in the area of reading instruction through microteaching opportunities that focus on specific teaching behaviors (Brownell et al., 2019). These microteaching opportunities could occur synchronously during in-person or virtual course meetings, as well as asynchronously using video observation and annotation platforms (e.g., GoReact, Edthena). Asynchronous microteaching opportunities allow for targeted peer feedback and self-reflection activities. Teacher candidates should also be presented with learning experiences that target the application of knowledge in the area of reading assessment, such as practice scoring assessments based on previously recorded videos or practice analyzing and interpreting assessment data.

RECOMMENDATION 4: ENSURE TEACHER CANDIDATES HAVE OPPORTUNITIES TO IMPLEMENT INSTRUCTIONAL PRACTICES WHILE RECEIVING ONGOING FEEDBACK AND SUPPORT.

Quality clinical experiences have been identified as one of the three aspects with the most potential to impact student outcomes positively (National Research Council, 2010). Clinical experiences allow teacher candidates multiple opportunities to practice implementing instructional practices they have been taught in authentic classroom settings (AACTE, 2018; Darling-Hammond & Sykes, 2003). Preservice teachers' opportunities to learn about instruction are greatly enhanced by supervision and feedback during practicum experiences (Dieker et al., 2014). Veteran mentor teachers or university supervisors must support preservice teachers during practicum experiences to help enhance their skills and develop effective teaching practices (Brownell et al., 2005).

While in the field, teacher candidates should be provided with coursework-aligned, practice-based opportunities that target the application of knowledge and skills, such as providing reading instruction in one-on-one, small-group, and whole-group settings. Teacher candidates should also practice administering, analyzing, and interpreting reading assessment data for students with which they are working. Additionally, teacher candidates should be offerred support that enhances their field learning, including structured lesson plan templates and structured video analysis protocols. Throughout clinical experiences, teacher candidates should have supervision and feedback that is immediate, positive, corrective, and specific (Scheeler et al., 2004). Teacher candidates should also have access to the reading professional learning opportunities provided in the districts where they are placed, including support from literacy coaches.

RECOMMENDATION 5: ENSURE TEACHER EDUCATORS AND CANDIDATES KNOW THE NATIONAL, STATE, AND LOCAL POLICIES ON READING ASSESSMENT, INSTRUCTION, AND INTERVENTION.

Given the numerous policy shifts in recent years, teacher educators must stay abreast of how these shifts affect their programs and their candidates. Up-to-date knowledge about state and local policies is vital for teacher educators and candidates. Many professional organizations, including AACTE, provide resources and activities to support learning about policy. Teacher preparation programs should include mechanisms to enhance teacher candidates' knowledge and application of policy.

One of the most relevant policy issues is developing and refining state standards for teacher preparation and licensure in reading. These may include requirements for initial teacher preparation, recertification, reading interventionist preparation, literacy coach preparation, school leader preparation, and teacher preparation program accreditation.

In addition to staying well-informed about current policies, teacher educators and teacher candidates should know how to advocate for adopting sound, evidence-based policies about reading instruction. This may include learning strategies for effective communication with local school boards, state legislators, or the state department of education about issues that affect reading teachers and their students. It may also include strategies for mobilizing educators to advocate for sound policy.

RESOURCES FOR EDUCATOR PREPARATION PROGRAMS

The resources listed here can provide teacher educators and educator preparation programs with guidance, examples, and tools to use in their program design and refinement efforts.

CEEDAR Innovation Configuration and Course Enhancement Modules

https://ceedar.education.ufl.edu/

The Collaboration for Effective Educator Development, Accountability, and Reform (CEEDAR) Center is funded by the US Department of Education to provide guidance to states in their preparation of teachers. CEEDAR has multiple resources to support teacher educators in their development of programs and syllabi in reading. Check out the "Resources and Tools" section of their web site.

The Center for Reading Science at Mount St. Joseph University

https://www.readingscience.org/implementing/

The Center for Reading Science provides program planning tools and sample syllabi that teacher educators can use as they develop or enhance their programs.

IDA Knowledge and Practice Standards for Teachers of Reading

https://dyslexiaida.org/kps-for-teachers-of-reading/

The International Dyslexia Association created Knowledge and Practice standards to apply to the preparation of all teachers of reading, not just those working with students who have dyslexia.

National Center on Improving Literacy (NCIL)

https://improvingliteracy.org/

The National Center on Improving Literacy (NCIL) hosts a wealth of resources on their web site, include many that can be used to develop and implement teacher preparation programs.

The Reading League

https://www.thereadingleague.org/

The Reading League is a national education nonprofit dedicated to increasing knowledge of science-based approaches to teach reading. The Reading League provides training and support to educators and school leaders.

Regional Education Laboratory-Southeast

https://ies.ed.gov/ncee/edlabs/regions/southeast/pdf/REL_2021060.pdf

Integrating Reading Foundations: A Tool for College Instructors of Pre service Teachers is a tool designed to support teacher preparation programs in building pre-service teachers' knowledge of evidence-based strategies for teaching reading in grades K-3. The tool includes guidance and resources (e.g., videos of effective practices).

Rhode Island DOE Resources

The Rhode Island Department of Education developed guidance documents for educator preparation programs to assist them in refining their instruction around the science of reading. These documents were designed for Rhode Island programs, but they are applicable for teacher educators anywhere.

Right to Read Act Guidelines for Educator Preparation Providers

https://www.ride.ri.gov/Portals/0/Uploads/Documents/Teachers-and-Administrators-Excellent-Educators/Educator-Certification/PrepRI/EPP_R2RAct_Guidelines.pdf

Rhode Island Science of Reading and Structured Literacy: Resource Bank for Syllabi Refinement

https://ceedar.education.ufl.edu/wp-content/uploads/2022/01/Rhode-Island-Science-of-Reading-and-Structured-Literacy-Resource-Bank.pdf

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