National Council on Teacher Quality

TEACHER PREP REVIEW

Reading Foundations

Technical Report

January 2023

Contents

Introduction

Teacher preparation programs must provide elementary teacher candidates with opportunities to gain the content and pedagogical knowledge necessary to effectively teach reading. The National Council on Teacher Quality (NCTQ) recognizes institutions can follow many paths to provide these opportunities, but ultimately, programs must ensure that candidates attain the essential knowledge and skills of scientifically based reading instruction.

Programs establish requirements for all enrolled candidates seeking an initial elementary teaching license,[1] which typically include prescribed and elective coursework as well as supervised practice. Successful completion of program requirements should serve as evidence that candidates have demonstrated at least minimal mastery of a body of knowledge and skills.

By evaluating the programs that produce the majority of traditionally prepared elementary teachers,[2] NCTQ aims to assess the extent to which programs address the key content aligned to scientifically based reading instruction, assess their candidates on this knowledge, and provide opportunities to practice or apply this knowledge. (See Appendix A for a discussion of the research rationale for the Reading Foundations standard.) NCTQ recognizes that given the availability of evidence, we cannot directly measure the mastery of the content and pedagogical knowledge candidates obtain (this is a function typically reserved for state-adopted licensure assessments) or the application to teaching (a function typically reserved for teacher evaluation processes).

Up until 2020, NAEP reading scores had increased only slightly since the early 1990s with large achievement gaps for students of color and students living in poverty. Modest gains in fourth grade reading proficiency since 1992 were erased during the pandemic.[3] The insufficient progress in reading even before the pandemic suggests that teachers need more and better instruction in how to teach reading. In response, NCTQ revised its *Teacher Prep Review* Reading Foundations standard (formerly known as the Early Reading standard) to address the following:

- **Advances in research.** The prior standard had been in effect for nearly a decade, and ongoing research on scientifically based reading instruction, including how to support a range of learners, merited revisiting this standard.
- **Rigor.** Experts in the field indicated that the prior version of the standard was not rigorous enough, and this view was confirmed by a survey of the field that NCTQ conducted (described in more detail later in this document).

For these reasons, this revised standard seeks to better reflect the field's expectations for preparation programs in teaching aspiring teachers how to teach reading, better identifying those programs that excel in preparing aspiring teachers in this area, and clearly indicating the areas of improvement needed by teacher preparation programs to improve teacher efficacy in teaching reading.

The revision of the NCTQ Reading Foundations standard also updates the indicators of what programs are teaching (referred to as instructional approaches)—***Instructional Hours***, ***Objective Measures of Knowledge***, ***Practice/Application***, and ***Background Materials***. Each instructional approach reflects a facet of preparation that can be determined from available syllabi for courses required of all elementary teacher candidates.

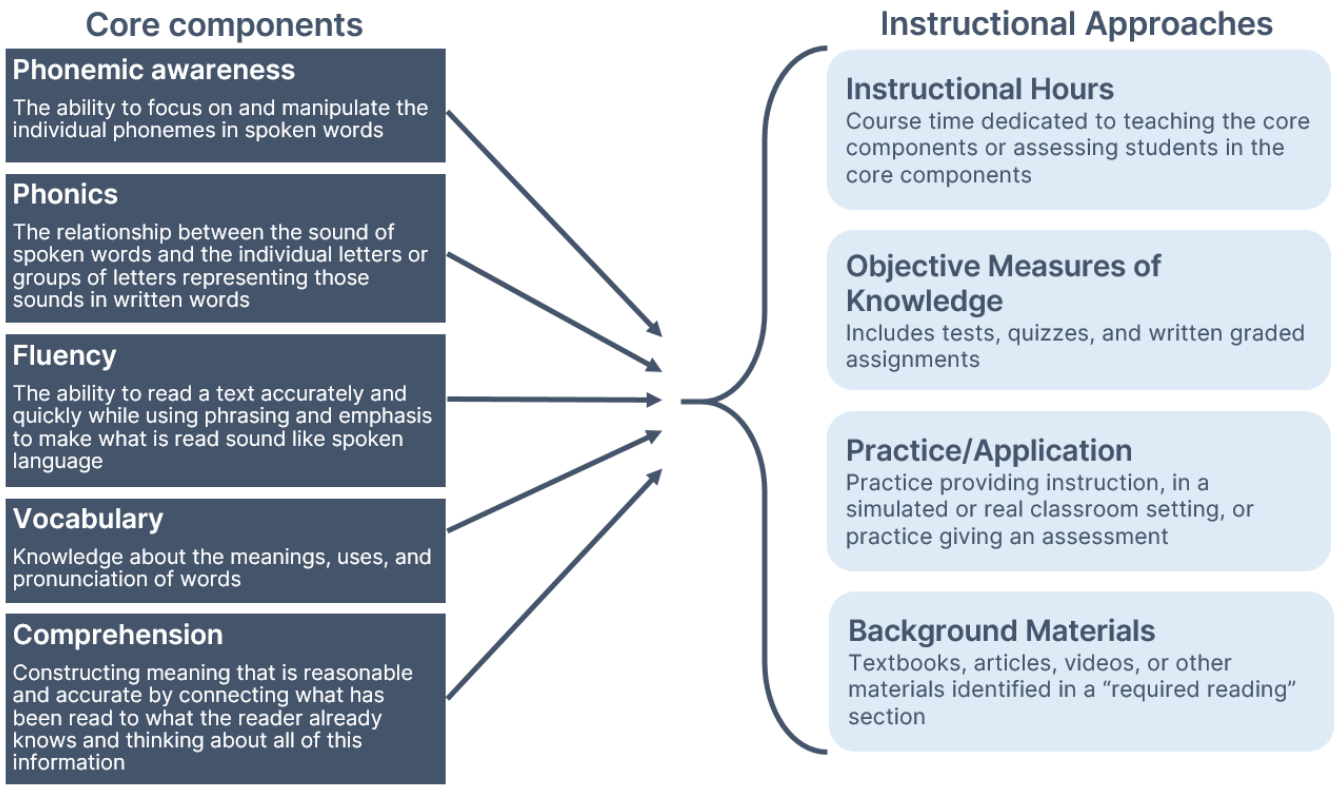
NCTQ revised the Reading Foundations standard to reflect current research on scientifically based reading instruction and on the knowledge and skills needed by teachers. In examining teacher preparation programs, NCTQ gathered program requirements and course materials as evidence to support the following claim:

> ***Educator preparation programs provide elementary teacher candidates with the evidence-based content and pedagogical knowledge in reading that underlies effective and equitable reading instruction.***

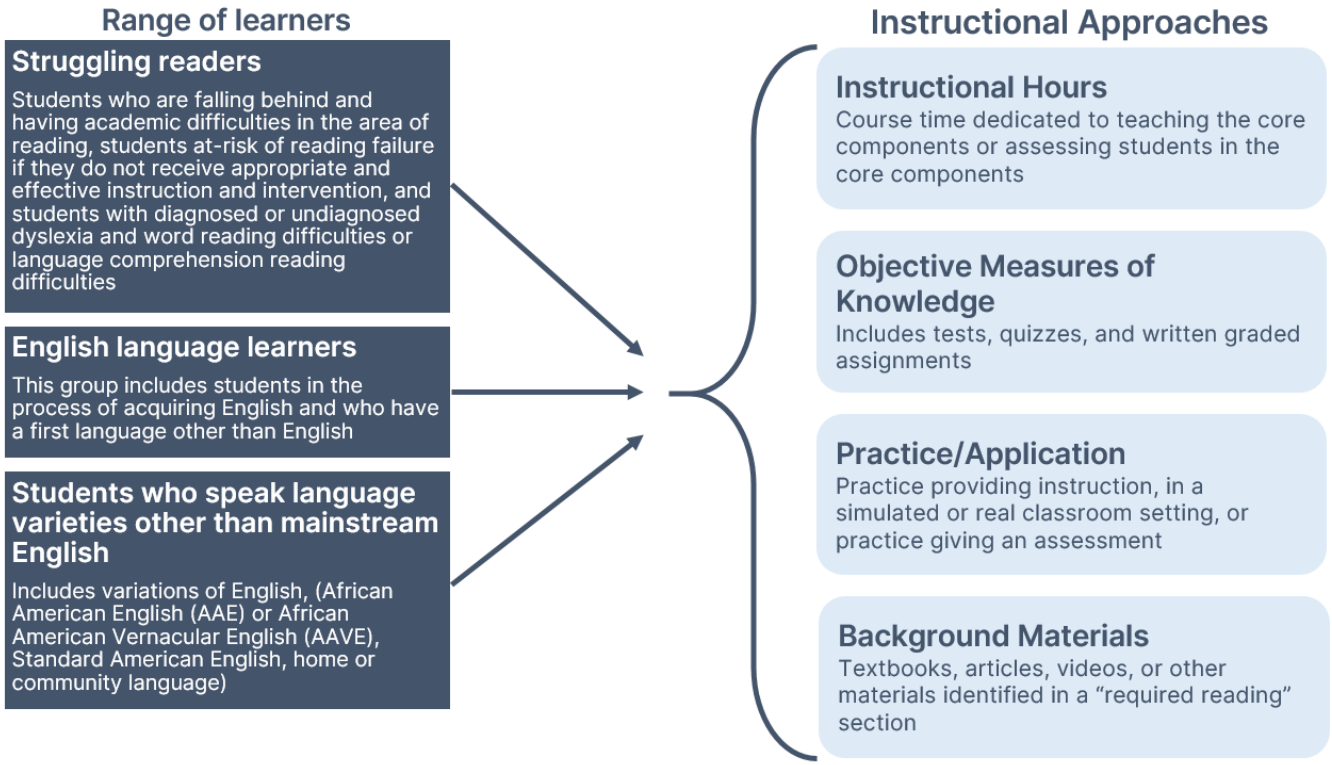
Brief overview of the Reading Foundations standard

The Reading Foundations standard has two parts:

Part one (graded): This part of the standard evaluates programs' attention to the core components of scientifically based reading: instruction in phonemic awareness, phonics, fluency, vocabulary, and comprehension; it also identifies whether programs are devoting attention to content contrary to research-based practices. Programs are evaluated based on their attention to each of the five components in four instructional approaches: Instructional Hours, Objective Measures of Knowledge, Practice/Application, and Background Materials.



Part two (ungraded): This part of the standard evaluates whether programs are providing instruction in how to support a range of learners, including struggling readers, English language learners, and students who speak language varieties other than mainstream English. Programs are evaluated based on their attention to specific student groups in four instructional approaches: Instructional Hours, Objective Measures of Knowledge, Practice/Application, and Background Materials.



Defining scientifically based reading instruction

Scientifically based reading instruction (which is grounded in the "science of reading" and in the research on how students learn to read) builds off the 2000 National Reading Panel (NRP) report[4] that stressed the importance of alphabetics (***phonemic awareness*** and ***phonics***), ***fluency***, and comprehension (including both ***vocabulary*** and ***comprehension***). The extensive review of literature underlying the NRP report and the subsequent two decades of research on effective teaching of reading support the focus of elementary instruction on these five core components. A 2016 report by the Institute of Education Sciences[5] confirmed the NRP findings.

The Simple View of Reading (SVR) model[6] and more recent Active View of Reading (AVR) model[7] incorporate the five core components of reading highlighted in the seminal NRP report. Expanding on SVR, the AVR stresses how critical word recognition (including ***phonological awareness*** and ***phonics***), bridging processes (including ***fluency*** and ***vocabulary***), and language ***comprehension*** are to skilled reading and effective reading instruction.

NCTQ is building on NCTQ's earlier work on the preparation of elementary teachers to effectively teach reading by refining the review of teacher preparation's reading instruction focused on phonemic awareness,[8] phonics, fluency, vocabulary, and comprehension. The revision of the NCTQ Reading Foundations standard increases the expectation for the time and attention programs devote to these components; the standard also accounts for the presence of flawed reading practices (e.g., three-cueing system, running records, balanced literacy, and guided reading) that unfortunately still survive in some teacher preparation programs. Research has also demonstrated the relationship of other components, in particular writing, to young readers' proficiency; however, NCTQ is focusing its review on the core components referenced in the NRP report.

Process to revise the Reading Foundations standard

To revise the Reading Foundations standard, NCTQ relied heavily on input from experts and the broader education field. The revision process included multiple points of external engagement, all described below. NCTQ solicited evidence from a panel of reading experts (Expert Advisory Panel) focused on the content of the standard, and a panel of technical experts (Technical Advisory Group) focused on the methodology of the standard. NCTQ also invited public comment for the first time from faculty preparing elementary teacher candidates, state and district education leaders, and other stakeholders via an Open Comment Survey.[9] Additionally, NCTQ examined available information on several teacher licensure assessments to support recommendations.

The purpose of the Reading Foundations standard revision process was to

a. Update the research basis underlying the standard,
b. Revisit the depth of instruction that is needed to prepare effective teachers,
c. Make the standard a more holistic view of the preparation program (i.e., combining information across all relevant required courses),
d. Recognize damage incurred to students by content that is contrary to research-based practices,
e. Highlight practices to support struggling readers, English language learners, and students who speak language varieties other than mainstream English,[10] and
f. Provide more in-depth and explicit feedback to elementary teacher preparation programs about their strengths in reading instruction and their areas for improvement.

This revision sought to keep pace with changes in the field, to recognize that children's reading proficiency continues to fall short, and to facilitate a transparent process that is more inclusive of feedback from external stakeholders. The results from the revised standard are intended to shed light on the current state of teacher preparation and to be a resource for teacher preparation programs' continual improvement.

Expert Advisory Panel

NCTQ gathered input on the content of the Reading Foundations standard and sources of evidence from reading experts and leaders from teacher preparation programs. In 2022, literacy expert Linda Diamond joined NCTQ's Reading Foundations team to serve as a lead literacy expert and advisor, and NCTQ expanded the expert panel to include experts specializing in the range of learners addressed by the revised standard—struggling readers, English language learners, and speakers of English language varieties other than mainstream English.

The expert panel met three times prior to finalizing methodology decisions:

- **Launch, 2021:** The expert panel first convened to review results from the previous *Early Reading* standard and examples of exemplary materials, resulting in an updated plan for the *Reading Foundations* methodology and scoring protocols. Critical changes included (a) the creation of Part 2 of the standard (focused on programs' instruction on supporting a range of learners), (b) the separation of the instructional approach of *Practice/Application* from *Objective Measures of Knowledge*, and (c) initial recommendations for increasing the number of Instructional Hours required for each component.
- **Meeting on part 1 of the standard (core components of reading instruction), 2022:** Expert advisors reviewed results from an analysis of a sample of programs, advising NCTQ on how to finalize changes to the methodology and revise thresholds for programs to meet acceptable coverage for each component of scientifically based reading instruction.
- **Meeting on part 2 of the standard (supporting a range of learners), 2022:** Expert advisors reviewed results from an analysis of a sample of programs regarding how to support a range of learners. The group provided feedback on *whether* to set a threshold of points programs must earn for each student group to be considered adequately addressing how to support that group, advised on *how* to set a threshold for acceptable coverage for each learner group, and discussed strategies for communicating results to increase attention to this part of the standard. The group also provided input on how to most appropriately respond (e.g., reduce programs' grades) to instruction on practices contrary to research.

Figure 1: Expert Advisory Panel members and attendance

	Role	Organization	Launch (2021)	Part 1 (2022)	Part 2 (2022)
Linda Diamond (Lead Advisor)	Literacy Expert	Teaching Reading Sourcebook		x	x
Louisa Moats	Literacy Expert	Author of LETRS	x		x
Antonio Fierro	Literacy Expert	LETRS Instructor	x		
Emily Solari	Professor	University of Virginia	x	x	
Amy Murdoch	Assistant Professor	Mount St. Joseph University	x	x	x
Brandy Gatlin-Nash	Assistant Professor	University of Virginia	x	x	
Lakeisha Johnson	Assistant Professor	Florida Center for Reading Research			x
Claude Goldenberg	Professor Emeritus	Stanford University		x	x
Kymyona Burk	Senior Policy Fellow	ExcelinEd		x	x

Technical Advisory Group

NCTQ sought advice on the analysis and scoring process from education policy, statistics, and psychometric experts. The Technical Advisory Group met several times during the standard revision process, including to examine early pilot data and later to examine scoring on a larger sample of program analysis, exploring questions related to reliability and scoring thresholds, among other topics.

Figure 2*:* Technical Advisory Group members and attendance

	Role	Organization	Pilot study (Jan 2022)	Preliminary results (Sept 2022)
Amber Willis	Program Director	Deans for Impact	x	
William Schmidt	University Distinguished Professor and Founder and Director of the Center for the Study of Curriculum Policy	Michigan State University	x	
Ed Crowe	Chief Executive Officer	TPI-US	x	x
Cory Koedel	Professor of Economics and Public Policy	University of Missouri	x	x
Jason Schweid	President	Continuous Measurement		x
Kristen Huff	Vice President Assessment and Research	Curriculum Associates	x	

Open Comment Survey

In addition to results and feedback from earlier T*eacher Prep Reviews* and the recommendations by the Expert Advisory Panel, NCTQ conducted an Open Comment Survey[11] of subject-matter experts and stakeholders. Almost 240 educators (69% working in teacher preparation programs, 8% working in state education agencies, 7% working as teachers or other positions in school districts, and 6% working as educational researchers or faculty not working directly in teacher preparation) responded to a range of questions regarding the preparation of teacher candidates to teach reading. More information about this feedback is below.

Licensure assessments

In addition to licensure assessments covering the core subjects taught by elementary teachers, NCTQ examined two assessments specifically addressing the teaching of reading that are used in more than 10 states—MTEL Foundations of Reading (MTEL FOR) and Praxis Teaching Reading: Elementary (Praxis TR:E 5205). NCTQ reviewed specifications for these assessments (as well job analysis information from Praxis) as supporting evidence for the revised Reading Foundations standard.

Feedback from the field on revisions to the Reading Foundations standard

Feedback on sources of evidence for the standard

As described above, NCTQ conducted an open comment survey of stakeholders to gather feedback on the draft Reading Foundations standard.[12] Of the almost 240 respondents, nearly all (89%) agreed or strongly agreed that it is important for teacher preparation programs to meet the NCTQ claim.[13]

To examine the extent to which teacher preparation programs address the core components of reading, NCTQ relies on course syllabi for required coursework as the main body of evidence. As recommended by the Expert Advisory Panel, the revised Reading Foundations standard considers four instructional approaches to capture the breadth and depth of attention a program dedicates to the core components—instructional time, Objective Measures of Knowledge, Practice/Application, and Background Materials—all equally weighted as indices of a programs' instruction in the five core components of scientifically based reading instruction.

The open comment survey asked if the process NCTQ had designed, examining syllabi and Background Materials for required reading and reading-related courses for evidence of the instructional approaches, would provide useful insights into the quality of teacher preparation programs. Approximately 86% of respondents agreed or strongly agreed (of the 206 who responded to this item).

When asked if common elements of course syllabi would provide useful information to evaluate teacher preparation programs, all instructional approaches identified by NCTQ for the revised process were viewed positively (see Table 1).

Table 1. Support for syllabus elements

Syllabus element	Percent agree or strongly agree that this element of a course syllabus would provide useful information to evaluate teacher prep programs
Class time (e.g., lecture topics)	88%
Textbooks	88%
Other background reading (e.g., journal articles)	89%
Objective Measures of Knowledge (e.g., tests, quizzes, written assignments)	88%
Applications (e.g., teaching a sample lesson) and practicum (teaching elementary students)	93%

These survey responses support the process of evaluating programs based on the information available in their syllabi. NCTQ also gives programs multiple opportunities to provide additional information: NCTQ contacts programs if a reading analyst finds a syllabus misses critical information, such as detailed assignment information, and programs have the opportunity to provide additional documentation when they receive their preliminary results if they believe their syllabi omit important information.

To explore the Expert Advisory Panel's recommendation to separately score *Objective Measures of Knowledge* and *Practice/Application*, the survey asked respondents if preparation programs should require candidates to demonstrate knowledge through:

- *only* an objective measure of knowledge (e.g., a test or assignment),
- *only* an application of knowledge (e.g., a practice opportunity like teaching a sample lesson),
- the option to complete *either* an objective measure of knowledge or an application of knowledge,
- the requirement that candidates should complete *both* an objective measure of knowledge or an application of knowledge, or
- *neither* of these demonstrations of knowledge.

A full 80% of respondents believe that programs should require candidates to demonstrate knowledge through *both* an objective measure of knowledge *and* an application of knowledge, offering clear support from the field for the Expert Advisory Panel's recommendation.

Based on the recommendation of the Expert Advisory Panel and input from the open comment survey, the revised standard considers *Objective Measures of Knowledge* and *Practice/Application* as separate instructional approaches when evaluating teacher preparation programs. Previous iterations of the standard combined these two instructional approaches. The increased emphasis on *Practice/Application* reflects the importance of ensuring candidates both learn **and** practice teaching the key components of reading instruction.

Feedback on Instructional Hours

Another significant change is the revised standard now expects more instructional time devoted to each component, with the amount of time varying by component. In the prior Early Reading standard, analysts looked for evidence that two class sessions were devoted to each component.

In fall of 2020, the Expert Advisory Panel made initial recommendations for Instructional Hours based on their experiences with teaching early reading instruction and on their analysis of preparation programs they considered to be strong (23 courses across 11 programs). The resulting recommendations from the expert panel were slightly lower than the averages they saw in these strong programs (e.g., 7.6 hours dedicated to phonemic awareness was rounded down to a recommendation of 7 hours).

To further explore this recommendation from the Expert Advisory Panel, during the open comment survey, NCTQ collected respondents' views on the number of Instructional Hours that programs should devote to phonemic awareness, phonics, fluency, vocabulary, and comprehension to adequately prepare teacher candidates to teach reading. On average, respondents recommended approximately 32 Instructional Hours, or approximately two semester credit hours, devoted to the five core components across required reading and reading-related courses. The breakdown by component is presented in Table 2. The average recommended Instructional Hours is presented (and the modal recommendation is highlighted) to inform the decision on the final thresholds of Instructional Hours needed to adequately teach each component and to earn full points (for grading purposes) for Instructional Hours for that component. The distribution of hours across components is also presented.

Table 2. Summary of subject-matter experts' judgments in open comment survey: Instructional Hours

	Phonemic awareness	Phonics	Fluency	Vocabulary	Comprehension
No course time	2	2	2	2	2
Less than 2 hours	4	3	6	3	2
2 to 3 hours	17	9	31	14	9
4 to 5 hours	44	34	60	32	22
6 to 7 hours	44	26	48	66	31
8 to 9 hours	40	62	24	39	57
10 or more hours	37	52	17	32	65
Average[a]	~6.2 hours	~7.1 hours	~5.1 hours	~6.3 hours	~7.4 hours
% of total	19.3%	22.0%	15.9%	19.6%	23.2%

[a] The average is based on the lower bound of the judgment category (e.g., "2 to 3 hours" equals "2", "10 or more hours" equals "10").
Highlighting indicates the modal response(s).

During the September 2022 Expert Advisory Panel meeting, the group revisited these recommendations, reviewing feedback from the open comment survey as well as the results from an analysis of approximately 130 programs. They voted again on what the hours should be, and the votes were largely in keeping with the initial recommendations. The expectations for Instructional Hours align with the Expert Advisory Panel recommendations in the table below.

Figure 3: Recommended Instructional Hours by component

	Phonemic awareness	Phonics	Fluency	Vocabulary	Comprehension
Expert panel	7 hours	8 hours	4 hours	6 hours	9 hours
Survey (average)	6.2 hours	7.1 hours	5.1 hours	6.3 hours	7.4 hours
Survey (modal response)	4 to 5; 6 to 7 hours	8 to 9 hours	4 to 5 hours	6 to 7 hours	10 or more hours
Hours threshold used in the updated Reading Foundations standard	**7 hours**	**8 hours**	**4 hours**	**6 hours**	**9 hours**

Instructional Hours input: National licensure assessments

To compare the revised standard against other assessments used in the field, NCTQ examined how two common early reading licensure tests address the five core components of reading. The redesign of the Praxis Teaching Reading: Elementary[14] (5205) test was supported by a survey ETS conducted of more than 100 educators—elementary teachers, reading specialists, and college faculty who prepare teacher candidates to teach reading—to determine the relevant and important knowledge and skills required to teach reading. These subject-matter experts overwhelmingly agreed (75% or more judged as important or very important) that knowledge of phonemic awareness (and related skills), phonics (and decoding), fluency, vocabulary, and comprehension was critical for beginning elementary teachers. (Experts also agreed that writing and assessment were critical for teaching reading.) The judgments of the relative importance of the five core components for beginning teachers (factoring out writing and assessment) are summarized in Table 3.

Based on the published test design and conversations with the test publishers for the Praxis Teaching Reading: Elementary and the MTEL Foundations of Reading,[15] it was determined that approximately 62% of both tests measure the core components of reading using multiple-choice items.[16] The

distribution of the items across the five core components, when factoring out other topics measured by the two licensure tests, is summarized in Table 3.

Table 3. Supporting evidence from licensure tests for proportion of assessment dedicated to teaching reading components at elementary grades, compared to proportion of Instructional Hours dedicated to each component based on NCTQ thresholds and the open comment survey

Core components	NCTQ thresholds[a]	Open Comment Survey[b]	Praxis TR:E	MTEL FOR
Phonemic awareness	20% (7 hrs)	17%	17%	14%
Phonics	24% (8 hrs)	20%	24%	29%
Fluency	12% (4 hrs)	15%	28%[c]	14%
Vocabulary	18% (6 hrs)	20%		14%
Comprehension	26% (9 hrs)	28%	29%	29%

[a] "NCTQ thresholds" refer to the number of Instructional Hours that programs should dedicate to each component to earn full points for Instructional Hours in that component. The percentages represent the proportion of hours dedicated to that component out of the total Instructional Hours across the five core components.
[b] The Open Comment Survey proportions represent the proportion of hours the average responses to the survey recommended be devoted to each component, out of the total average recommended hours.
[c] Test specifications for the Praxis Teaching Reading: Elementary test combined fluency and vocabulary; additional information was not provided to separate the percentage of multiple-choice items covering each.

The distribution of the recommended Instructional Hours thresholds from the NCTQ Expert Advisory Panel and the Open Comment Survey largely align with the finding from the educator survey conducted by ETS and the designs of the two national licensure tests focusing on teaching reading in the elementary grades.

Significant changes to the NCTQ Reading Foundations standard

The feedback and revision process for the Reading Foundations standard resulted in several significant changes that will better support program improvement and reflect current research. The revised standard will have two parts:

Part one (graded): This part of the standard will evaluate programs' attention to the core components of reading, instruction in phonemic awareness, phonics, fluency, vocabulary, and comprehension; it will also identify whether programs are devoting attention to content contrary to research-based practices.

Part two (ungraded): This part of the standard will evaluate whether programs are providing instruction in how to support a range of learners.

Summary of changes to Reading Foundations standard part one: Core components of reading instruction

- ***Changes in time required on a component.*** NCTQ revisited and adjusted the instructional time threshold for each of the five core components based on input from the Expert Advisory Panel and the Open Comment survey. The amount of instructional time varies by component (described in detail later), and is generally greater than the instructional time expected in the earlier version of the standard (previously, two class meetings or class periods per component).
- ***Changes in Practice/Application expectations.*** Previous iterations of the standard combined "tests," "assignments," and "practice" under *Demonstration of Knowledge*. In the revised standard, *Practice/Application* is separated from the newly titled Objective Measures of Knowledge section (tests/quizzes, and graded assignments) to better focus on the importance of programs providing candidates with opportunities to apply teaching the five core components in actual or simulated classrooms.
- ***Deduction of points for contradictory approaches.*** Unfortunately, the content of required reading courses does not always reflect the current research highlighted by the National Reading Panel and *What Works Clearinghouse*. The revised standard calls out instances of teaching practices that run counter to scientifically based reading instruction (for more information on these contrary approaches, see the research rationale in Appendix A). If

programs teach four or more of the contrary practices identified below, they lose a letter grade.

Terms that indicate content contrary to the research-based practices include: three-cueing system; miscue analysis; running records; balanced literacy; leveled texts; guided reading; reading workshop; embedded or implicit phonics; and specific assessments such as Developmental Reading Assessment (DRA), Informal Reading Inventory (IRI), or Qualitative Reading Inventory (QRI) that have been determined to be unreliable.

Summary of changes to Reading Foundations standard part two: Supporting a range of learners

While all students benefit from scientifically based reading instruction, teacher candidates need to learn additional teaching techniques and assessment strategies to support all students in becoming proficient readers. This part of the standard adds analysis of whether teacher candidates learn to support a range of learners, including struggling readers, English language learners, and students who speak language varieties other than mainstream American English. This part of the standard will provide programs with feedback but will not be graded for several reasons: (1) NCTQ has not included these areas of focus in the standard before and this year will provide baseline data; (2) instructing students with language varieties other than mainstream English is an area with new research and therefore an emerging focus of the field; and (3) providing two grades within the same Reading Foundations standard may cause unnecessary confusion.

- **Struggling readers:** This group includes students who are falling behind and having academic difficulties in the area of reading, students at risk of reading failure if they do not receive appropriate and effective instruction and intervention, and students with diagnosed or undiagnosed dyslexia and word reading difficulties or language comprehension reading difficulties. Analysis looks for specific references to this group of students in course materials (e.g., references to non-proficient readers or at-risk students).
- **English language learners:** This group includes students who are in the process of acquiring English and who have a first language other than English. Analysis looks for specific references to this group of students in course materials (e.g., references to ELLs, second language learners) or relevant concepts (e.g., use of cognates where applicable, use of primary language where applicable, explicit instruction in transferable and non-transferable sounds) related specifically to learning to read.

- **Students who speak language varieties other than mainstream American English:** Analysis looks for references to variations of English, (African American English (AAE) or African American Vernacular English (AAVE), Standard American English, home or community language). Often this is referred to as dialects. Analysis looks for instructional techniques such as code-switching and contrastive analysis taught to the teacher candidates to support speakers of English variations from mainstream English.

Sample of teacher prep programs

For the 2023 *Teacher Prep Review* Reading Foundations standard, the full universe of programs eligible to be rated was 1,151, including programs in all public institutions that actively produce elementary teachers and all private institutions with an annual production of at least 10 elementary teachers. Because not all programs provided sufficient documentation to be rated, the final sample includes 680 programs in 50 states and the District of Columbia—both undergraduate and graduate elementary teacher preparation programs that led to initial state licensure or certification—housed in 567 institutions of higher education (IHEs).

Two-thirds of the programs (524 of 680 programs or 77%) are housed in public IHEs. NCTQ reviewed 507 undergraduate and 173 graduate programs. Non-traditional programs are not included in this analysis at this time. NCTQ examined both their undergraduate and graduate elementary programs at 20% of the institutions (113 of the 567 IHEs). The majority of the institutions with only one program in the sample of the remaining institutions offer only an undergraduate or graduate initial certification elementary program.

While 962 institutions were invited to submit relevant course syllabi, 58 public institutions and 338 private institutions did not provide materials, and so are not included in this analysis. Programs for which we have less than half of the relevant syllabi are also not included in this analysis. While not a census of all programs in the nation,[17] the 680 programs that comprise our sample make for a diverse subset representing institutions that produce 66% of traditionally prepared elementary teachers and illustrate the variety of programs preparing elementary teacher candidates.

Although not all programs provided sufficient relevant materials, in general, programs and the institutions that house them cooperated at a higher rate than in past years. In 2022, 302 institutions provided materials voluntarily (84 private, 218 public), compared to 180 institutions in 2020 (56 private, 124 public).

Identifying relevant courses and collecting evidence

Identifying relevant courses

A team of analysts use course catalogs to determine the relevant coursework for each elementary program in the sample. The analysts read course titles and descriptions to pinpoint all required courses that may address reading instruction. Relevant courses may be added or irrelevant courses may be removed if a program requests amendments to the requested course list based on requirements.

The typical undergraduate program that was invited to participate requires 9.5 credits (or approximately 142 Instructional Hours) in reading and reading-related courses; the typical graduate program requires 6.4 credits (or approximately 96 Instructional Hours). Only a portion of these required courses is devoted to the five core components of reading—phonemic awareness, phonics, fluency, vocabulary, and comprehension. The remainder of courses cover topics related to literacy (listening, writing, literature), classroom management, general pedagogy, etc. The Reading Foundations standard focuses on the five core components and support for a range of learners, and only accounts for these topics when reviewing programs. With the exception of instruction on content contrary to research-based practices, time spent on other topics (e.g., writing, children's literature) does not count for or against a program's grade.

Gathering course syllabi

NCTQ submits a request to all potential institutions in the sample for voluntary participation. The request to institutions includes the name of the program(s) being analyzed, all reading courses identified within each program, and a detailed description of which materials NCTQ uses from each syllabus. NCTQ sent initial requests to all institutions in the sample in March 2022. Due to the volume of interest in voluntary participation, NCTQ extended the deadline to late April 2022. During this process, if universities request changes to contact information, courses requested, or university details, NCTQ updated the Reading Foundations database. Additionally, NCTQ analysts engage with respondents to ensure that documents contain all necessary information.

When institutions do not voluntarily provide information, NCTQ sends Open Records Requests to public universities within the states that have implemented a state version of the Freedom of Information Act. Each request details the program(s) analyzed, courses requested, and additional details about the information needed within each syllabus. NCTQ sent public records requests on May 24, 2022.

For non-responsive institutions, analysts pull forward materials gathered during the previous review, when available. Older course materials from the 2018 or 2020 *Teacher Prep Review* were pulled forward for 78 programs (23 graduate programs and 55 undergraduate programs) in the instances that these courses are still offered by the institution. Programs are not reviewed if syllabi for more than half of courses that address reading instruction are missing.

Evaluating evidence

In evaluating material available from teacher preparation programs, trained NCTQ analysts review syllabi and background materials from required courses for evidence of coverage of phonemic awareness, phonics, fluency, vocabulary, and comprehension, as well as attention to supporting a range of learners. (See the section on the coding process below for more information about analysts' training and background.)

The five core components of scientifically based reading instruction

As described previously, no single component of reading instruction can stand alone; students must receive explicit, systematic instruction across these components. However, it's helpful to understand what these components are and why they matter for students' literacy. For each of these components, analysts evaluate evidence from the four instructional approaches described in the section on instructional approaches, below.

- ***Phonemic awareness***: Phonemic awareness is the ability to focus on and manipulate the individual phonemes in spoken words.[18] Phonemic awareness is a type of phonological awareness.[19] Programs are given credit for course coverage of both phonemic awareness and phonological awareness in the category of phonemic awareness.

  Relevant terms indicating attention to *phonemic awareness* in syllabi include: phonemes/sounds; identifying, isolating, blending, segmenting and manipulating phonemes; categorizing phonemes; deleting, adding, substituting phonemes to form new words; Elkonin sound boxes; sound boards; onset and rime (without the support of print); body-coda; 44 phonemes; phoneme proficiency.

- ***Phonics:*** Phonics represents the relationship between the sounds of spoken words and the individual letters or groups of letters (graphemes) representing those sounds in written words. Knowledge of phonics also includes knowledge of patterns and constraints on the use of letter sequences in the writing system (orthography), and knowledge of how syllables and

meaningful word parts (morphemes) are represented in print."[20] Spelling and alphabetic principles are included within NCTQ's coding for phonics. In addition, multisyllabic word instruction and irregular and high frequency words are also included within NCTQ's phonics category.

Relevant terms indicating attention to *phonics* include: phonics/alphabetic principle; decoding/re-coding/encoding/spelling; sound-symbol relationships; sound-spellings; word study/word analysis (for decoding)/ word sorts tied to phonics; graphophonemic relationships; letter-sound relationships (digraphs, blends); Elkonin boxes with letters; orthographic mapping; orthography; blending sounds/sounding out; phoneme/grapheme mapping; automaticity with decoding; syllable types, patterns, multisyllabic words; Ehri's Phases; irregular or regular high frequency word decoding; role of decodable or connected texts for practice; word recognition.

- ***Vocabulary:*** Vocabulary "refers to knowledge about the meanings, uses, and pronunciation of words."[21] Vocabulary consists of (a) oral vocabulary, words that we use in speaking (when we talk to others) and words that we recognize and understand in listening (when others talk to us); (b) reading vocabulary, words we recognize or use when we see them in print; (c) writing vocabulary, words we use when we write; and (d) academic language, words that are used in academic dialogue and text.

  Relevant terms indicating attention to *vocabulary* include: word study (if mentioned with vocabulary and word meanings); oral language development as a part of vocabulary development; context clues to support vocabulary (not decoding); tiered levels of words; morphology (also called structural analysis); prefix, suffix, root; word learning strategies for vocabulary; academic language or vocabulary; word/semantic mapping; student-friendly explanations for vocabulary development; active engagement with vocabulary words; word origins and histories; challenging texts read aloud to build vocabulary.

- ***Fluency:*** Fluency is the ability to read a text accurately and quickly while using phrasing and emphasis to make what is read sound like spoken language.[22]

  Relevant terms indicating attention to *fluency* include: repeated readings; reader's theater (if connected to fluency); partner reading; oral reading practice for students; modeling fluent reading through read alouds; choral reading or echo reading; tape-assisted reading; chunking (linked to fluent phrasing); accuracy, rate, prosody; oral reading fluency; automaticity with words.

- ***Comprehension:*** "Comprehension involves constructing meaning that is reasonable and accurate by connecting what has been read to what the reader already knows and thinking about all of this information until it is understood."[23] NCTQ's comprehension component includes background knowledge building, comprehension strategies, and the use of interactive read-alouds to build comprehension.

  Relevant terms indicating attention to *comprehension* include: comprehension monitoring/comprehension strategies; graphic organizers for comprehension; reciprocal teaching as a comprehension strategy; asking and answering questions/question frames for comprehension; text-based discussion, such as Question the Author (QtA), Accountable Talk; making/checking predictions; clarifying, visualizing, inferencing; summarizing/story retelling; main idea; listening comprehension for young children; read alouds; think-alouds/modeling metacognition; story and text structure (problem-solution, cause-effect, etc.); literary (narrative) and informational texts; building background/building knowledge; integrating science and history; scaffolding for support with comprehension; building content knowledge with challenging/content-rich texts; conversations before, during, and after read alouds or reading; syntax and text comprehension.

Supporting a range of learners

Analysts also review course materials for instruction on how to support a range of learners. These groups of students include struggling readers, English language learners, and students who speak language varieties other than mainstream English. For each of these groups, analysts evaluate evidence from the four instructional approaches described in the section on instructional approaches, below.

- ***Struggling readers:*** This group includes students who are falling behind and having academic difficulties in the area of reading, students at risk of reading failure if they do not receive appropriate and effective instruction and intervention, and students with diagnosed or undiagnosed dyslexia and word reading difficulties or language comprehension reading difficulties. Analysis looks for specific references to this group of students in course materials (e.g., references to non-proficient readers or at-risk students).

  Relevant terms include: non-proficient readers/students, at-risk students (for reading failure), students with reading/learning/language disabilities; expressive language, oral language, language processing; dyslexia; word reading difficulties; reading comprehension difficulties; Response to Intervention (RTI)/Multi-tiered System of Supports (MTSS) in the

area of reading; Developmental Language Disorders; Intervention; Diagnostic planning/teaching in area of reading; data-based determination of need; progress monitoring; increased explicitness of a component.

- ***English language learners:*** This group includes students in the process of acquiring English and who have a first language other than English; also called EL (English learner) or MLL (Multilingual learner). Analysis looks for specific references to this group of students in course materials (e.g., references to ELLs, second language learners) or relevant concepts (e.g., use of cognates where applicable, use of primary language where applicable, explicit instruction in transferable and non-transferable sounds) related specifically to learning to read.

  Relevant terms include: ELL; English learners; multilingual learners; second language learners; English as a second language (ESL); bilingual students; Limited English Proficiency (LEP); Culturally and linguistically diverse students; culturally responsive instruction with examples for this population, including honoring or not criticizing home language; language development with attention to phonology, syntax, morphology, orthography, language structure; understanding of transferable and non-transferable sounds; use of cognates where appropriate; use of primary language where appropriate; oracy (a term descriptive of speaking and listening comprehension).

- ***Students who speak language varieties other than mainstream English:*** Analysis looks for references to variations of English: African American English (AAE) or African American Vernacular English (AAVE), Standard American English, home or community language). Often this is referred to as dialects. Analysis looks for instructional techniques such as code-switching and contrastive analysis taught to teacher candidates to support speakers of English variations from mainstream English.

  Relevant terms include: code-switching; contrastive analysis (features similar and different); phonology and morphology tied to this category; rule governed; African American English (AAE) or African American Vernacular English (AAVE); Standard American English (SAE); non-mainstream or standardized English or dialect; home or community language; culturally responsive teaching that includes familiarity with the linguistic structure of the language variation and includes making connections.

Evidence of content contrary to research-based practices

When reviewing course syllabi, analysts also look for evidence that programs are teaching topics or approaches contrary to research-based practices. Content contrary to research-based practices, such as the three-cueing system, running records, balanced literacy, and guided reading are noted by references to these topics in course topics and lecture schedules. Contrary topics also were considered when determining the adequacy of the Background Material.

These contrary practices refer to practices that are not supported by evidence and contradict the settled methods of reading instruction that have been found to be most effective for teaching reading. Terms that indicate approaches contrary to scientifically based reading instruction include: three-cueing system; miscue analysis; running records; balanced literacy; leveled texts; guided reading; reading workshop; embedded or implicit phonics; and specific assessments such as Developmental Reading Assessment (DRA), Informal Reading Inventory (IRI), or Qualitative Reading Inventory (QRI) that have been determined to be unreliable. For research on these practices, see the Research Rationale in Appendix A.

Instructional approaches

For each of the five core components and for support for a range of learners, analysts look at course syllabi for evidence in four instructional approaches, or different facets of how programs teach their candidates. Figure 4 summarizes the instructional approach data collected for each required course. When calculating a grade for part one of the standard (the five core components), data is combined across required courses when calculating the program grade.

- **Instructional Hours:** This instructional approach includes:
    - Part one:
        - In-class instruction about the five components of reading instruction.
        - In-class instruction about assessments used to measure students' skill progress in the five components.
    - Part two: In-class instruction devoted to supporting a range of learners.
- **Objective Measures of Knowledge:** Assignments must be graded to be credited for this standard. Applicable approaches include:
    - Part one:
        - Tests/quizzes/exams, including both assessments of candidates' knowledge of the five components and assessments of candidates' knowledge of student assessments related to the components.

        - Written graded assignments, including both assignments on the five components and assignments on assessing students' skills related to the five components.
    - Part two: Objective Measures of Knowledge (tests/quizzes/exams and written graded assignments) focused on supporting a range of learners.
- **Practice/Application:** Both graded and ungraded practice count toward this standard. This instructional approach includes:
    - Part one:
        - Instruction or assessment of K–12 students, or a simulation of K–12 instruction or assessment.
        - Practice occurring during either class time or practicum experiences. (Practice during class time also counts toward in-class instruction.)
        - Practice giving an assessment of students' skills related to the five components.
    - Part two: Practice opportunities focused on supporting a range of learners.
- **Background Materials:** A separate group of subject-matter experts reviews background material assigned in relevant courses and determines which, if any, of the five components are being adequately covered, or address supporting a range of learners, and if the material includes content contrary to research-based practices. If a Background Material does not address a component or topic related to supporting a range of learners, the material's score does not count against a program, but rather it earns a "Not Applicable" score for that component or student group. Note that analysis considers the entirety of any Background Materials assigned, even if a course only mentions specific chapters or sections from the materials. This rationale is based on the fact that even if a professor does not address a certain chapter, this resource is still accessible to aspiring teachers. This instructional approach includes:
    - Any textbooks, articles, videos or additional materials identified in a prominent "Required Readings" section, most often located near the top of a syllabus; or,
    - In instances where a "Required Readings" section does not exist, NCTQ identified additional Background Materials identified within the lecture schedule; or,
    - In instances where the lecture schedule does not identify any required readings or Background Materials, NCTQ looks for additional named materials within assignment descriptions.

Figure 4. Course-level data for instructional approaches (for each component)

Instructional approach	Data
Instructional Hours	Estimated hours of course time totaled across courses
Objective Measures of Knowledge	Number of (a) tests/quizzes and (b) graded written assignments
Practice/Application	Number of practice sessions
Background Materials	Each material is coded dichotomously as inadequate or adequate in its attention to a component. Scores for materials on a component are averaged within a course and then across courses

Coding process

Training process for syllabus analysts

Analyst recruitment

NCTQ recruited analysts by sharing job postings with networks of practitioners and experts highly engaged in scientifically based reading instruction. Applicants submitted a resume and answered a screening question, "What do preservice teachers need to know in order to be prepared to effectively teach students to read?" NCTQ reviewed resumes, and invited candidates with relevant experience for a virtual interview. After the interview, applicants completed a mock analysis of an article related to balanced literacy.

Background of analysts

NCTQ selected 10 analysts for the Reading Foundations standard—three analysts continued from previous analysis cycles, one analyst came to the standard after working on NCTQ's *Classroom Management* standard for the *Teacher Prep Review*, and six analysts were hired for the revised standard. Of the analysts, 100% were currently or formerly employed as elementary teachers, 60% are certified in scientifically based reading techniques (e.g., LETRS, Orton-Gillingham, Wilson), and 90% have completed at least a Masters in Science. All analysts were selected by early January 2022.

Training

NCTQ trained analysts over the course of two months, starting in January 2022 until the launch of a test pilot in March 2022. Literacy expert Linda Diamond both developed and led training, assisted by two "lead analysts" who worked on the standard's previous iteration. Analysts completed three training sessions separated by norming assignments—the first training outlined a description of the components for part one (the five core components) and part two (supporting a range of learners) of the standard, the second training outlined how to code syllabi, and the third training calibrated scoring prior to releasing analysts to conduct independent analysis. After completing all sessions,

analysts completed a shared assignment and received individualized feedback. All analysts met a 90% or above accuracy benchmark prior to the first individual pilot.

Syllabus coding

Instructional Hours

For each course identified as relevant to reading instruction, analysts code the number of course sessions dedicated to each of the five reading components, code content contrary to research-based practice, and code support for the three categories of a range of learners. Course sessions were coded for these topics in 0.25 session increments.[24]

For example, a course session with the description below would be credited as devoting half the session to phonics and half the session to phonemic awareness because the session is split between multiple topics.

May 22nd	- Phonics:
	  - 1. Definition of phonics
	  - 2. Phonics instruction
	- Phonemic awareness
	  - 1. Definition of phonemic awareness
	  - 2. Phonemic awareness instruction

The team of analysts were not tasked with deciphering the number of *Instructional Hours* represented by each session; they were responsible only for coding the number of sessions (or fractions of sessions) dedicated to reading components in each syllabus.

Analysts look specifically for the portion of the syllabus with a schedule or sequence of classes and topics for those class sessions. Information about course standards, objectives, lists of topics, and reading assignments are not scored as in-class instruction. Class time that is devoted to tests, quizzes, or work on written graded assignments is not counted; class time devoted to in-class practice opportunities also counts as Instructional Hours.

Objective Measures of Knowledge

Analysts code (a) quizzes, tests and exams, and (b) written assignments as addressing each of the five components of reading and the three categories of a range of learners. Quizzes, tests, and exams are coded dichotomously for each component or group of learners (not addressed/addressed), written assignments are coded using a four-point scale (not addressed, part of one graded assignment, one graded assignment, and more than one graded assignment) for each component or group of learners. Tests and quizzes are presumed to address the content that has been previously taught in the course

(for example, if the test or quiz is administered halfway through the semester, analysts assume the test or quiz includes any content taught in class sessions during the first half of the semester).

Written assignments must be graded to earn credit. If a written assignment addresses more than one component or more than one group of learners, it is scored as "part of one graded assignment" for each component it addresses. If the assignment incorporates a core component and some other content (for example, phonics and writing), the core component it addresses earns credit for "part of one graded assignment." If an assignment does not address any core components, it counts as "no assignment" for any of the components. If practice occurs as part of a graded assignment, it counts toward *Practice/Application* and not *Objective Measures of Knowledge*.

Practice/Application

Analysts code if the course requires candidates to practice (actual or simulated) teaching the component of reading, or to teach each group of a range of learners. Practice/Application can occur during class time or practicum experiences. Practice/Application that occurs during class time also counts toward in-class instruction. Coding uses a four-point scale (not required, part of one practice session, one practice session, and more than one practice session). Practice/Application does not have to be graded to earn credit. If the Practice/Application addresses more than one component or more than one group of learners, it is scored as "part of one graded Practice/Application" for each component it addresses. If the Practice/Application incorporates a core component and some other content (for example, phonics and writing), the core component it addresses would earn credit for "part of one graded Practice/Application." If practice occurs as part of a graded assignment, it counts toward *Practice/Application* and not *Objective Measures of Knowledge*.

Programs tend to be weaker in Practice/Application, which may be in part because syllabi often do not provide detailed descriptions of what candidates are expected to practice. Because field placements vary widely in terms of grade levels and the content being taught in an elementary classroom on any given day, NCTQ's protocol does not assume any specific content is practiced unless it is explicitly stated in the syllabus. For examples of practice opportunities that do or do not specify components, see Appendix B.

If the Practice/Application task does not address any core components, it counts as "no practice" for any of the components. A practice session that is not clearly focused on a component does not earn credit for that component. For example, if candidates can select what skill to practice without parameters linking it to a reading component, the program would not receive credit for that practice session.

Background Materials coding

Training process for Background Materials analysts

Analyst recruitment. NCTQ recruited analysts by sharing job postings with networks of practitioners and experts highly engaged in scientifically based reading instruction. Applicants submitted a resume and answered a screening question, "What do pre-service teachers need to know in order to be prepared to effectively teach students to read?" NCTQ reviewed resumes and responses to the screening question, and invited candidates with relevant experience for a virtual interview. After the interview, applicants completed a mock analysis of an article related to balanced literacy.

Background of analysts. NCTQ selected eight analysts for the Background Materials review—all candidates currently work in a position requiring reading expertise; five currently or formerly worked as an elementary teacher or reading specialist, four as literacy consultants, and one is an adjunct professor of reading. All analysts have achieved a Master's in Science in Education, one earned their Doctorate in Education, and four are current Doctoral candidates.

Training. To train analysts, NCTQ created an extensive protocol detailing how to analyze textbook materials. Analysts attended one virtual training to introduce them to the grading protocol, then completed an individualized assignment that was compared to a previously completed Background Material analysis. When analysts completed at least two Background Material reviews that matched previous analysis, they began completing assignments individually.

Coding process

Background Materials that course syllabi identify for required reading fall into two categories: resources (such as articles, research papers, or instructional videos) or textbooks. Experts analyze textbooks with attention to the five components, supporting a range of learners, and content contrary to research-based practices.

Resources are identified as either *core materials, supplementary materials, or synopsis materials.* Core materials address all components, whereas supplementary materials may only address one or a few components or learner populations. Materials that cover one or more components or learner populations, but not in significant depth (e.g., an introductory video to the definition of phonics) are categorized as synopsis materials. While analysts do categorize coverage of each component based on acceptability, synopsis materials do not earn any points toward the overall grade.

Information about required textbooks is typically readily available, provided publicly by university bookstores, and listed within a "required materials" or similar section of a syllabus. In the event that a course requires materials not listed under "required materials," the program can submit this

information during the score preview window and NCTQ will include or add it to the program's analysis as appropriate.

Pilot testing

Prior to reviewing the full sample of programs, NCTQ designed a systematic coding process and then piloted this process to ensure reliability and refine the process as necessary. During the pilot, 84 courses were independently coded by two analysts. Eight analysts participated in coding during the pilot.

Instructional Hours

For each course, analysts either identify each component as being addressed (Instructional Hours greater than zero) or not addressed. Table 4 summarizes the dichotomous agreement between the two analysts. The percent agreement was above 80% for all five components but was lower for vocabulary and comprehension. The correlations between the Instructional Hours recorded by each analyst are also summarized in Table 4. The correlations were above 0.70 for all components, but again lower for vocabulary and comprehension. Finally, the average absolute difference in the estimated Instructional Hours was calculated (see Table 4). While the average differences were small for phonemic awareness and fluency, the differences were larger (approximately 0.75 to 1.5 hours) for the remaining components.

Table 4. Pilot test dichotomous agreement, correlations, and average (absolute) difference – Instructional Hours

	Phonemic awareness	Phonics	Fluency	Vocabulary	Comprehension
Dichotomous agreement	92.9%	88.1%	91.7%	84.5%	83.3%
Correlation	0.91	0.83	0.88	0.72	0.70
Average (absolute) diff.	0.32 hrs	1.05 hrs	0.34 hrs	0.72 hrs	1.53 hrs

Objective Measures of Knowledge

Identification of a quiz, test, or exam addressing a component of reading in a course syllabus was coded dichotomously and the agreement between analysts is presented in Table 5. The percent agreement was above 80% for all components but vocabulary (79%). Graded written assignments were coded using a four-point scale. Exact and adjacent (exact agreements plus adjacent agreements) are summarized in Table 5. Adjacent agreement was above 85% for phonemic awareness, phonics, and fluency but near 70% for vocabulary and comprehension.

Table 5. Pilot test agreement – Objective Measures of Knowledge

	Phonemic awareness	Phonics	Fluency	Vocabulary	Comprehension
Quizzes, tests, & exams					
Dichotomous agreement	89.3%	86.9%	85.7%	78.6%	81.0%
Graded assignments					
Exact agreement	65.5%	56.0%	71.4%	64.3%	51.2%
Adjacent agreement	91.7%	86.9%	90.5%	71.4%	71.4%

Practice/Application

Analysts coded if a course requires candidates to practice (actual or simulated) teaching each component of reading. The coding used a four-point scale (not required, part of one practice session, one practice session, and more than one practice session). Exact and adjacent (exact agreements plus adjacent agreements) are summarized in Table 6. Other than Comprehension (83%), the adjacent agreement was above 90% for all components. The agreement rates between analysts may be inflated by the lack of Practice/Application for all components except comprehension in over three-quarters of the courses (i.e., both analysts coded "not required").

Table 6. Agreement – Practice/Application

	Phonemic awareness	Phonics	Fluency	Vocabulary	Comprehension
Exact agreement	89.3%	86.9%	89.3%	89.3%	73.8%
Adjacent agreement	97.6%	95.2%	95.2%	97.6%	83.3%

While adjacent agreements were relatively high, based on the lower rate of exact agreement for Practice/Application and graded assignments, NCTQ issued additional guidance to analysts, including providing a "look for" document providing common examples from syllabi and how analysts should assign credit. An additional training included a shared assignment completion of a "difficult to grade syllabus," and provided analysts with differentiated assignments based on their prior level of proficiency.

Scoring for part one: Core components of reading instruction

Instructional Hours target and points

NCTQ set Instructional Hours targets based on the recommendations of the Expert Advisory Panel and the Open Comment Survey (see the earlier section on "Feedback from the field" for more detail).

Programs earn up to three points for their *Instructional Hours* dedicated to each component based on what proportion of the Instructional Hours target they address (see Table 7).

Table 7. Instructional Hours target

	Phonemic awareness	Phonics	Fluency	Vocabulary	Comprehension
Instructional Hours target	7 hours	8 hours	4 hours	6 hours	9 hours

For example, if a program dedicates nine hours to comprehension (which has a target of 9 hours), the program earns the full three points. If the program dedicates more than nine hours, it is capped at the full three points. If the program dedicates less than nine hours, it earns the resulting proportion of points. For example, if a program dedicates three hours, or one-third of the Instructional Hours target for comprehension, it earns one-third of the available points, or one point. This calculation is informed by input from the Technical Advisory Group because it gives programs credit for the most precise calculation of hours (rather than using discrete categories of hours to equate to points, e.g., less than two hours earns no points, while two to four hours earns one point).

Objective Measures of Knowledge (OMK) target and points

Based on recommendations from the Expert Advisory Panel, NCTQ set the target to earn full points for Objective Measures of Knowledge on each component at more than one test, quiz, exam, or graded written assignment.

Practice/Application target

Based on recommendations from the Expert Advisory Panel, NCTQ set the target to earn full points for Practice/Application on each component at more than one practice session focused on the component.

Background Materials target

Background Materials fall into two categories: textbooks or resources, such as articles, research papers; or instructional videos, that course syllabi identify as required. Experts analyze textbooks for their attention to the five components. *Core materials* address all components, and *supplementary materials* may only address one or a few components. Materials that cover one or more components, but not in significant depth (e.g., an introductory video to the definition of phonics) are categorized as *synopsis materials*, and while analysts do categorize coverage of each component based on acceptability, these categorizations do not result in points.

For each component, each Background Material item (e.g., a single textbook or reading) will earn three points if it explains both the research underlying the component and its application in reading instruction for all students, and contains little or no content contrary to research-based practices. If a material has an inadequate explanation of a component or if it includes substantial content contrary to research-based practices, it earns no points for that component. A core material with acceptable content across all components earns three points for each component. A core material that has an unacceptable explanation of any component earns a zero for those components, and a "not applicable" (N/A) designation for the acceptable components. This maintains a calculation where, for those components which are coded as N/A for a material, the material does not count towards actual points earned nor available points to be earned and so has no effect on the points earned for that component. Supplementary materials are only scored for the components which they address, and receive an N/A for other components.

Background material points for each component are averaged within a course, and then across courses. For example, if one course had two textbooks that address phonics, and one earned three points and one earned 0 points, the average score for Background Materials for that course would be 1.5 points. If the program had a second course with an average of three points for Background Materials on phonics, then the program average for Background Materials on phonics would be 2.25 (the average of 1.5 points and three points).

It's important to note that because Background Materials scores are averaged across materials within a course, and then across courses, points for this instructional approach can result in a decimal (e.g., 2.3 points out of three).

Inter-rater reliability

After analysis is underway, NCTQ conducts a "RevStat" (short for "Review Statistics") process to verify inter-rater reliability, check for drift in analysis over time, and identify any potential coding issues that require additional training or corrections. NCTQ identified a random sample of 10% of programs that would be coded by a second analyst.

NCTQ held three RevStat meetings over the course of analysis, in addition to the pilot study. The first meeting identified several areas where analysts needed additional training: coding the type of course session (e.g., daily versus weekly), providing targeted training to specific analysts, and providing additional training and practice with coding evidence of comprehension and coding the Practice/Application instructional approach. NCTQ provided additional training to analysts on these issues. The second and third meetings looked at additional double-coded analysis and did not surface any new concerns.

Table 8. Number of programs and courses included in each RevStat analysis

	Courses	Programs*
Initial pilot	84	35
Second pilot	91	31
Early Fall oversample	135	49
Late Fall oversample	101	41

*Count of programs with at least one course in sample, not fully evaluated programs

The following tables show course-level agreement among analysts for each RevStat iteration for each instructional approach and component or student group.

In-class instruction

Analysts coded the number of class sessions dedicated to each of the five reading components for each course. The analysts completed this coding using course syllabi for the full scope of required coursework that addressed the teaching of reading.

The number of Instructional Hours represented in each class session (as defined by each syllabus) were determined and the resulting multiplier was applied to convert the number of relevant course sessions into Instructional Hours. The number of coded hours do not sum to the total number of Instructional Hours for the course since instructional time is frequently devoted to other content (writing, children's literature, etc.) or clinical practice (which is separately captured under the standard).

Dichotomous agreement. For each course, an analyst either identifies a component as being addressed or not. Using this comparative approach, all amounts of class sessions dedicated to a component are considered equal. As a result, this measure stands as the most basic review of agreement between analysts.

Table 9a. Dichotomous course-level agreements: part one of standard

	Phonemic awareness	Phonics	Fluency	Vocabulary	Comprehension
Initial pilot	93%	88%	92%	85%	83%
Second pilot	95%	88%	91%	85%	89%
Early Fall oversample	95%	91%	90%	90%	89%
Late Fall oversample	96%	96%	92%	88%	86%

Table 9b. Dichotomous course-level agreements: part two of standard

	Struggling readers	English language learners	Speakers of English language varieties
Second pilot	85%	88%	96%
Early Fall oversample	88%	88%	99%
Late Fall oversample	90%	90%	97%

Note: Analysis of support for a range of learners (part two of the standard) was not included in the initial pilot.

Objective Measures of Knowledge

In addition to instructional time, analysts also coded (a) quizzes, tests and exams, and (b) written assignments as addressing each of the five components of reading. Quizzes, tests, and exams were coded dichotomously (not addressed/addressed) and written assignments were coded using a four-point scale (not addressed, part of one graded assignment, one graded assignment, and more than one graded assignment).

Quizzes, tests, and exams. Addressing each of the components of reading is coded dichotomously and the agreement between analysts is presented below.

Table 10a. Quizzes, tests, and exams agreement: part one of standard

	Phonemic awareness	Phonics	Fluency	Vocabulary	Comprehension
Initial pilot	89%	87%	86%	79%	81%
Second pilot	88%	86%	87%	82%	88%
Early Fall oversample	90%	88%	87%	86%	84%
Late Fall oversample	88%	92%	83%	83%	88%

Table 10b. Quizzes, tests, and exams agreement: part two of standard

	Struggling readers	English language learners	Speakers of English language varieties
Second Pilot	81%	87%	98%
Early Fall oversample	88%	93%	98%
Late Fall oversample	89%	91%	97%

Note: Analysis of support for a range of learners (part two of the standard) was not included in the initial pilot.

Written assignments. Graded written assignments are coded using a four-point scale. The results of the course-level exact and adjacent (exact agreements plus adjacent agreements) are presented below.

0 points: No assignments

1 point: Part of one assignment

2 points: One assignment

3 points: More than one assignment

Table 11a. Written assignments exact and adjacent agreement for Science of reading components: part one of standard

	Phonemic awareness		Phonics		Fluency		Vocabulary		Comprehension	
	Exact	Adjacent	Exact	Adjacent	Exact	Adjacent	Exact	Adjacent	Exact	Adjacent
Initial pilot	66%	92%	56%	87%	71%	91%	64%	85%	51%	71%
Second pilot	77%	93%	65%	85%	74%	90%	73%	88%	62%	81%
Early Fall oversample	73%	91%	69%	87%	81%	93%	66%	87%	62%	80%
Late Fall oversample	76%	88%	74%	87%	71%	86%	67%	84%	60%	78%

Table 11b. Written assignments exact and adjacent agreement for Range of learners components: part two of standard

	Struggling readers		English language learners		Speakers of English language varieties	
	Exact	Adjacent	Exact	Adjacent	Exact	Adjacent
Second pilot	81%	92%	90%	97%	98%	99%
Early Fall oversample	84%	93%	90%	94%	99%	100%
Late Fall oversample	81%	87%	79%	87%	96%	99%

Note: Analysis of support for a range of learners (part two of the standard) was not included in the initial pilot.

Practice/Application

Instructional practice (actual practice in an elementary classroom or simulated practice) is coded using a four-point scale. The results of the course-level exact and adjacent (exact agreements plus adjacent agreements) are presented below.

0 points: No practice

1 point: Part of one session

2 points: One session

3 points: More than one session

Table 12a. Practice/Application exact and adjacent agreement for Science of reading components: part one of standard

	Phonemic awareness		Phonics		Fluency		Vocabulary		Comprehension	
	Exact	Adjacent	Exact	Adjacent	Exact	Adjacent	Exact	Adjacent	Exact	Adjacent
Initial pilot	89%	98%	87%	95%	89%	95%	89%	98%	74%	83%
Second pilot	88%	95%	78%	92%	84%	94%	88%	94%	73%	88%
Early Fall oversample	84%	92%	76%	87%	86%	93%	83%	91%	78%	87%
Late Fall oversample	90%	96%	81%	87%	91%	95%	83%	90%	71%	84%

Table 12b. Practice/Application exact and adjacent agreement for Range of learners components: part two of standard

	Struggling readers		English language learners		English language variations	
	Exact	Adjacent	Exact	Adjacent	Exact	Adjacent
Second pilot	93%	94%	96%	96%	100%	100%
Early Fall oversample	89%	92%	94%	96%	100%	100%
Late Fall oversample	93%	98%	97%	98%	99%	100%

Determining grades for part one: Core components of reading instruction

For each of the five components of reading—phonemic awareness, phonics, fluency, vocabulary, and comprehension—a teacher preparation program receives a score between zero to three for each instructional approach: Instructional Hours, Objective Measures of Knowledge (OMK), Practice/Application, and Background Materials. For each component, a program can earn a maximum of 12 points. The point totals represent the accumulation of evidence across all required reading and reading-related courses for the program. Figure 5 defines component-level scoring (on the zero to three scale) for each of the four instructional approaches.

Figure 5. Summary of component-level scoring (across courses)

Instructional approach	Component-level points			
	0	1	2	3
Instructional Hours	Number of hours summed across courses divided by the threshold times three points (capped at three points)			
Objective Measures of Knowledge	No tests/ quizzes **AND** no graded written assignments	Part of one graded written assignment	One graded written assignment	At least one test/quiz **OR** more than one graded written assignment
Practice/ application	No practice/ application session	Part of one Practice/Application sessions	One practice/ application sessions	More than one Practice/Application sessions
Background Materials (averaged within and then across courses)	Unacceptable materials earn a 0; acceptable materials earn a three. All materials on a component are averaged within a course and then across courses.			

Figure 6: Example of scoring for one component

Component: Phonemic awareness

Instructional approach	Component analysis (across all courses)	Points earned
Instructional Hours (based on a proportion of the total hours needed to meet the threshold)	4 hours out of the 7 hours needed to meet threshold $(4\ hours \div 7\ hours) \times 3\ points)$	1.7
Objective Measures of Knowledge	One graded written assignment	2
Practice/Application	One practice session	2
Background Materials (averaged within and then across courses)	One textbook, two supplementary materials: all deemed acceptable	3
Total points earned for this component		**8.7**

Grading rubric

Program grades are based on the number of components for which a program earns credit (i.e., at least eight points out of 12 possible points). To earn credit for a component, a program must meet a total point threshold for that component (out of 12 possible points). Scores for each component level are compensatory; since points are summed across the four instructional approaches, strength in one approach (e.g., Instructional Hours) can help compensate for a relative weakness in another (e.g., Practice/Application). However, program-level grading is not compensatory, meaning that earning more points in one component (e.g., comprehension) does not substitute for fewer points for another component (e.g., phonemic awareness), as all components are important and necessary for students to learn to read.

For the 2023 Reading Foundations standard, a program must earn eight points out of 12 possible points to receive credit for a component. This threshold is slightly more lenient than the threshold initially recommended by the Expert Advisory Committee; this group originally recommended that a program must receive nine of the possible 12 points to be credited for a reading component. However, the Technical Advisory Group suggested lowering the cutoff to eight points out of 12, requiring programs to earn 66% of available points to earn credit for a component, equivalent to past iterations of the Early Reading standard (when programs had to earn six out of nine available points to earn credit for a component). When NCTQ presented data from a sample of programs to the

Expert Advisory Panel, the Panel was generally supportive of an eight-point threshold (the majority of panel members voted in favor of an eight-point threshold, while one voted for nine points and one voted for six points). Given that multiple aspects of the standard have become more rigorous, NCTQ is following the recommendation of the Technical Advisory Group and the ultimate recommendation of the Expert Advisory Group to set the threshold at eight out of 12 points for programs to earn credit for a component.

Grading for a program is based on the number of reading components for which the program receives credit. Figure 6 summarizes the grading rules. Each component—phonemic awareness, phonics, fluency, vocabulary, and comprehension—is equally weighted. A program would receive a "B" if four of five reading components receive eight or more points, regardless of which four components earn eight or more points.

Criteria to earn an A+

Some programs provide exceptionally strong preparation in how to teach reading. These programs may devote additional time to reading instruction, require more assignments or practice opportunities, or may assign an especially strong set of Background Materials. Programs that earn an A, average at least 10 points across components (compared with meeting an eight-point threshold for each component to earn an A) and teach no content that is contrary to research based practices earn an A+ in recognition of their strong approach to scientifically based reading instruction.

Figure 7. Grading rules

Program grade	Grading rule: Receive eight or more points for …
A+	Programs earn an A, meet a higher point threshold for each component (an average of 10 points across components) and teach no content contrary to research-based practices
A	All five reading components
B	Four of the five reading components
C	Three of the five reading components
D	Two of the five reading components
F	One or none of the five reading components

Score deductions for content contrary to research-based practices

Teaching practices that run counter to research-based reading instruction are far less effective than scientifically based reading instruction to teach children to read.[25] Even if teacher candidates are also

taught research-based practices, teaching practices such as three-cueing systems and balanced literacy can send aspiring teachers mixed messages about how best to provide reading instruction to their students (see the research rationale in Appendix A for more detail).

If a program teaches four or more of these contrary practices in any relevant reading courses, the program will lose a letter grade from its score.

Reporting on exemplary practices

Programs will also receive feedback (which does not count toward their grade on the Reading Foundations standard) on their inclusion of content that indicates programs are providing candidates an understanding of how and why scientifically based reading instruction is effective. These terms suggest that preparation programs not only provide instruction in how to effectively teach reading, but *why* these practices work (compared with contrary practices). Relevant terms can include:

- Nature of scientific research/characteristics of strong research
- How the brain works when reading
- Linguistics relevant to reading
- Assessment based in reading science
- Structured literacy

Analysts look for evidence of these terms across all instructional approaches.

Scoring for part two: Supporting a range of learners

Teachers need to be able to support a range of learners with different needs. This analysis also considers whether preparation programs are specifically preparing teachers to support different groups of students: struggling readers, English language learners, and students who speak language varieties other than mainstream English.

For each of these groups, analysts evaluate whether textbooks adequately address supporting these groups, code the number of Instructional Hours dedicated to teaching how to support these groups, and determine whether any Objective Measures of Knowledge or Practice/Application opportunities are devoted to these groups.

Figure 8. Summary of scoring for supporting a range of learners (across courses)

	Student group-level points		
Instructional approach	**0**	**1**	**2**
Instructional Hours	Number of hours summed across courses divided by two hours, times two points (capped at two points)		
Background Materials	None or unacceptable	--	Acceptable
Objective Measures of Knowledge	Not addressed	Part of one assignment	One or more test, quiz, or graded written assignment
Practice/Application	No practice	Part of one practice session	One practice session

While NCTQ does not factor this support for a range of learners into the overall grade on the Reading Foundations standard, NCTQ does report back to programs and to the general public about whether the program provides instruction, Objective Measures of Knowledge, Practice/Application, and Background Materials devoted to supporting a range of learners.

Programs will be provided information about how many points (out of eight possible) they earn for instruction on how to support each group of students, as well as an indication (in the form of a percentile) about how they compare to all other programs that were analyzed.

Alternative scoring method when the program does not provide complete data

Scenario one: Syllabi are available but missing some information

In some cases, NCTQ has syllabi available for programs' relevant courses, but these syllabi are missing some information (for example, they do not provide any details about course assignments, or they do not provide a lecture schedule). All programs included in the *Teacher Prep Review* are given at least two opportunities to provide this information: first when NCTQ's analysts verify materials for completeness, and second when NCTQ provides the preliminary score to programs. However, not all programs provide additional information.

When this occurs, NCTQ rates programs on the available information and notifies programs during the score preview (the second opportunity described above) that they have no points for an instructional approach in a component, in the event that the program wants to provide additional information that may have been absent from the course materials provided.

Scenario two: Some syllabi are not available

Many programs require multiple reading courses. NCTQ endeavors through multiple means to gather all relevant syllabi, including requests for voluntary participation, Open Records Requests, searching online caches, and pulling forward materials used in the 2020 *Teacher Prep Review* for currently available courses.

To address cases where some syllabi are missing, NCTQ explored creating a "rating with less complete data," in which we try to impute scores based on available information. However, because content tends to vary widely between courses, and because reading instruction in one course does not always align with reading instruction in another course, it was determined that there is no fair and accurate way to create this alternate scoring method.

In the event that we have at least half of the syllabi for relevant courses (for example, if there are four relevant courses, we need at least two syllabi; if there are three relevant courses, we need at least two syllabi), NCTQ will rate the program based on available information. Programs have multiple opportunities to provide additional information, including when they are reviewing their preview scores.

Adjudication of program ratings when programs preview their scores

All programs receive preliminary grades with information detailing both program- and course-level data. Course-level data exists in a spreadsheet sent to program leaders, and is not available on the public-facing program page (described in more detail below). NCTQ invites all program leaders to respond to analysis by providing additional information, such as syllabi, assignment descriptions, or other relevant information that they believe may improve their grade. NCTQ gives programs one month to reply to their preliminary grades and can extend this time frame upon request.

When programs provide additional information, NCTQ first reviews the information to ensure that it is relevant to analysis. If the information is irrelevant, NCTQ notifies the program and asks them to send additional information as necessary. If the provided information is relevant, the original analyst responsible for grading the program integrates the new information into the original analysis and updates the program's overall score. The revised score and additional rationale is sent to the program with an invitation to provide additional information, as necessary.

Program grades are made publicly available after programs have had the opportunity to review their preliminary scores and provide any additional evidence or clarification; these program grades will be published in Spring 2023.

Reporting program-level data on the program page

The program page is a public-facing webpage (to be released in Spring 2023) with program-specific information including: (a) the program's grade on part one of the Reading Foundations standard, (b) the program's points earned (out of 12) for each of the core components, (c) the program's instruction on content contrary to research-based practices and whether this was enough to deduct a letter grade, (d) the program's attention to exemplary practices, and (e) the program's attention to supporting a range of learners.

Programs also receive more detailed course-level scoring information in a direct email from NCTQ as part of the process of sharing preliminary scores.

Appendix A: Research rationale

Does knowledge of reading instruction matter for elementary teachers?

Literacy is one of the human rights issues of our time. Students who learn to read in the elementary grades are more likely to finish high school[26] and have far greater educational and career opportunities ahead of them. There is settled science about how to effectively teach reading so that nearly every child can read. Yet as of 2019, only one in three fourth graders reads proficiently,[27] and nine year olds' literacy rates have dropped precipitously in the last few years.[28] These literacy challenges persist into adulthood.[29] Systematic failure to teach reading disproportionately harms students of color: less than a quarter of Hispanic students and a fifth of Black fourth grade students read proficiently, because we have not given them the opportunity to learn.[30]

In the wake of the pandemic, children's reading challenges have grown considerably.[31]

When teachers know and use scientifically based reading instruction, the rate of reading failure among children can be cut from three in ten children to one in ten.[32]

Research on scientifically based reading instruction

Scientifically based reading instruction, which is grounded in the science of reading and in research on how students learn to read, is a vast, interdisciplinary body of *scientifically based research* about reading and issues related to reading and writing.[33]

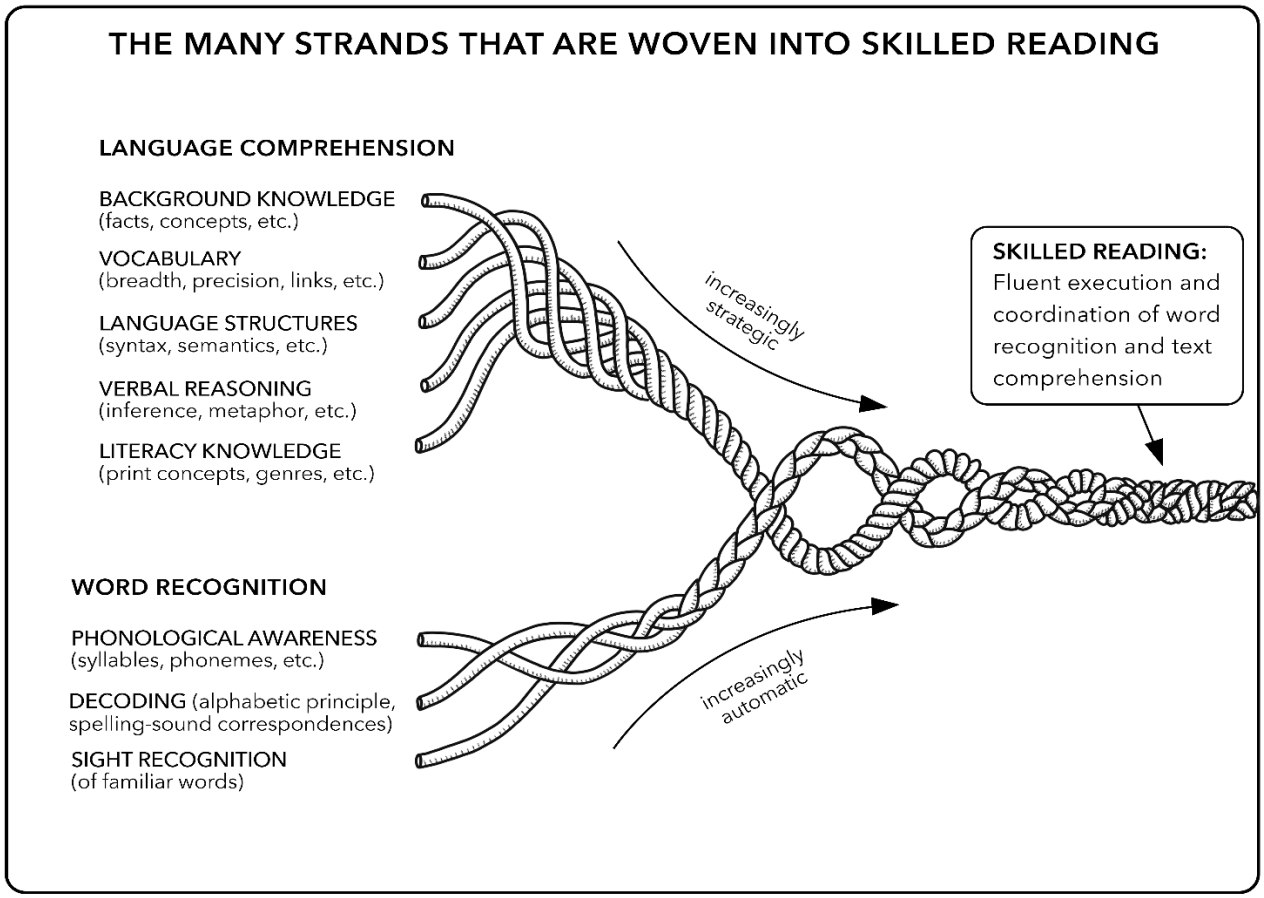
This research has been conducted across the world over the last five decades, and is derived from thousands of studies conducted in multiple languages with thousands of students. Scientifically based reading instruction has culminated in a preponderance of evidence to inform how proficient reading and writing develop; why some students have difficulty learning to read; and how we can most effectively teach and assess progress in reading and, therefore, improve student outcomes through prevention of, and intervention for, reading difficulties. This research initially culminated in a report authored by the 2000 National Reading Panel, convened by the U.S. Congress and under the auspices of the National Institutes of Health.[34] The 2016 What Works Clearinghouse (WWC) practice guide based on a comprehensive review of 56 studies that meet the WWC's rigorous research standards further validates the importance of instruction tailored to the five core components of scientifically based reading instruction.[35]

The "simple view of reading" asserts that reading comprehension results from word recognition and language comprehension. This view is illustrated by the Simple View graphic (below) that clearly shows that Word Recognition multiplied by Language Comprehension equals Reading Comprehension.

In this equation, both Word Recognition (WR) and Language Comprehension (LC) are essential; if either multiplier is zero, the result is zero.

Gough, P. B., & Tunmer, W. E. (1986). Decoding, reading, and reading disability. *Remedial and Special Education*, 7, 6-10.

Another explanation of the components that lead to reading comprehension is "Scarborough's reading rope," which the national organization the Reading League refers to as a "visual metaphor for the development of skills over time (represented by the strands of the rope) that lead to skilled reading."[36]



Citation: Reprinted from Scarborough, H. S., Neuman, S., & Dickinson, D. (2009). Connecting early language and literacy to later reading (dis)abilities: Evidence, theory, and practice. *Approaching Difficulties in Literacy Development: Assessment, Pedagogy and Programmes*, *10*, 23-38.

Language comprehension is "the ability to extract and construct literal and inferred meaning from linguistic discourse represented in speech" and includes drawing from background knowledge and an understanding of how language works (phonological knowledge, syntactic knowledge, and semantic knowledge).[37] ***Word recognition*** is "the ability to recognize printed words accurately and quickly to efficiently gain access to the appropriate word meanings" and includes the skills of knowledge of alphabet principles including phonemic awareness, and concepts about print.[38] **This "simple view of reading" has been validated by over 150 scientific studies.**[39]

NCTQ has worked with a panel of experts to develop a standard that evaluates teacher preparation programs' instruction on the broad science of reading based on its five core components: phonemic awareness, phonics, fluency, vocabulary, and comprehension. Analysts look for evidence of these five components when analyzing teacher preparation programs' instruction in scientifically based reading instruction, and when analyzing the breadth and depth of licensure tests of aspiring teachers' knowledge of scientifically based reading instruction.

Research on the five core components of scientifically based reading instruction

As described previously, no single component of reading instruction can stand alone; students must receive explicit, systematic instruction across these components. However, it's helpful to understand what each component is and why each matters for students' literacy.

Phonemic awareness

Phonemic awareness is the ability to focus on and manipulate the individual phonemes in spoken words.[40] Phonemic awareness is a type of phonological awareness.[41] In the Reading Foundations standard, programs are given credit for course coverage of both phonemic awareness and phonological awareness.

Examples of phonemic awareness include *phoneme isolation*, "which requires recognizing individual sounds in words (e.g., "Tell me the first sound in the word 'paste'") as well as *phoneme identity*, "which requires recognizing the common sound in different words" (e.g., "Tell me the sound that is the same in bike, boy, and bell") and *phoneme segmentation*, "which requires breaking a word into its sounds by tapping out or counting the sounds or by pronouncing and positioning a marker for each sound (e.g., "How many phonemes are there in *ship*?" among other skills.[42]

Decades of research confirm that explicit, systematic instruction in the core components of reading is the most effective and efficient means of teaching children to read. For example, one summary of research finds,

> "teaching children phonological awareness and letter knowledge, particularly when combined, results in improved word-decoding skills. Teaching children to decode words using systematic and explicit phonics instruction results in improved word-decoding skills. Such instruction is effective both for monolingual English-speaking children and children whose home language is other than English."[43]

A meta-analysis of 235 studies found that phonemic awareness has a strong correlation with "individual differences in word reading ability."[44] A meta-analysis of 52 studies conducted by the National Reading Panel found large overall effects of phonemic awareness instruction (an effect size of 0.86) and moderate effects on both reading outcomes (0.53) and spelling outcomes (0.59).[45] The National Reading Panel concluded that, "teaching children to manipulate phonemes in words was highly effective across all the literacy domains and outcomes," and found that these positive effects held across all types of learners, including students in different grades, students across a range of socioeconomic backgrounds, "disabled readers," and English language learners.[46]

Phonics

Phonics is defined as "[t]he relationship between the sounds of spoken words and the individual letters or groups of letters (graphemes) that represent those sounds in written words. Knowledge of phonics also includes knowledge of patterns and constraints on the use of letter sequences in the writing system (orthography), and knowledge of how syllables and meaningful word parts (morphemes) are represented in print."[47] Spelling and alphabetic principles are included within NCTQ's coding for phonics. In addition, multi syllabic word instruction, irregular and high frequency words are also included within NCTQ's phonics category.

The National Reading Panel's analysis of 38 studies, which included students identified as poor readers and students identified as reading disabled, concluded, "[f]indings provided 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."[48] Further, phonics instruction led to substantial improvement for children at risk of being struggling readers and those with disabilities.[49]

It is worth noting that the National Reading Panel's meta-analyses generally compare these approaches (e.g., phonics instruction) against alternative treatments (rather than against no instruction at all in reading). The findings on phonics instruction break out results against different

types of control groups: basal, regular curriculum, whole language, whole word, and miscellaneous. Systematic phonics instruction was significantly more effective (with effect sizes ranging from 0.31 for whole language to 0.51 for whole word instruction) compared to every other type of instruction.[50]

More recent research continues to confirm the findings of the National Reading Panel. For example, research continues to find that opportunities to practice "relationships between sounds and letters produce the strongest results for the greatest number of students."[51] For example, numerous experiments conducted by Linnea Ehri and her colleagues found that,

> "visual representations were formed when letter-sound connections bonded spellings to pronunciations and meanings in memory. Systematic knowledge of the writing system as it mapped speech provided the glue that secured written words in memory, not arbitrary associations."[52]

In other words, learning the sounds made by different patterns of letters, and then learning words built from those letter-sound patterns, cemented those words into memory so that when students later come across the same word, they recognize it rather than having to sound it out or, worse, having to guess it.

A meta-analysis that included 22 randomized controlled trials concluded 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. The mean effect sizes of the remaining treatment approaches did not reach statistical significance. The present meta-analysis demonstrates that severe reading and spelling difficulties can be ameliorated with appropriate treatment."[53]

Another meta-analysis of 14 studies focused specifically on poor readers found that phonics training improved students' "literacy-related skills, particularly reading fluency of words and non-words, and accuracy of reading irregular words."[54]

A study of England's phased implementation of "systematic phonics" found that the effects on five year olds was equivalent to the positive effect of lower class sizes (and at much lower cost), and also yielded positive effects on seven year olds. While the study found that most children learned to read eventually, and only found positive effects of phonics instruction for students who had a high probability of being struggling readers (English language learners and those from disadvantaged backgrounds), the study concluded that the positive "effect sizes for the most disadvantaged group seem high enough to justify the costs of the policy."[55]

Scientifically based reading instruction is sometimes mischaracterized as an exclusive focus on phonics.[56] This distillation is inaccurate; phonics is only one part of a multifaceted approach to reading instruction. Reading expert Linnea Ehri describes, "[s]ystematic phonics instruction has been mischaracterized as only skill and drill, with little attention to meaning. This is false. Phonics programs may use engaging games or interesting materials to teach letter–sound associations, for example, letter shape–sound picture mnemonics….Students apply their letter–sound knowledge to decode words in meaningful texts from the outset."[57] The National Reading Panel report itself stated, "[f]inally, it is important to emphasize that systematic phonics instruction should be integrated with other reading instruction to create a balanced reading program. Phonics instruction is never a total reading program."[58]

Fluency

Fluency is the ability to read a text accurately and quickly and using phrasing and emphasis in a way that makes what is read sound like spoken language.[59] Fluency is important because being able to read fluently supports reading comprehension.[60] The National Reading Panel's review of research found that guided oral reading procedures had a positive effect on fluency, while too little research examined the effect of independent reading and so the panel could not conclude that independent reading encourages fluency.

The What Works Clearinghouse's 2016 practice guide finds additional support for building fluency, stating that students should read connected text (i.e., a passage of multiple, related sentences) every day to build fluency as well as comprehension and accuracy.[61] A report on the National Assessment of Education Progress (NAEP) Oral Reading Fluency study found a relationship between reading passage data (speed, accuracy, and expression) and performance on the NAEP reading assessment.[62]

Several studies find that students' fluency is associated with their academic aptitude (in this case, ACT scores), even into college.[63] Another study found that, for general education students (but less so for ELL students and for students with a learning disability), fluency in third grade is predictive of reading comprehension in high school.[64]

Vocabulary

Vocabulary "refers to knowledge about the meanings, uses, and pronunciation of words."[65] Vocabulary consists of:

- Oral vocabulary: words that we use in speaking (when we talk to others) and words that we recognize and understand in listening (when others talk to us).
- Reading vocabulary: words we recognize or use when we see them in print.
- Writing vocabulary: words we use when we write.
- Academic language is also included in NCTQ's vocabulary category.[66]

While the National Reading Panel was not able to identify sufficient studies to conduct a formal meta-analysis on vocabulary, the report explained that vocabulary plays an essential role in learning to read and that vocabulary instruction leads to gains in reading comprehension.[67] This report further found that students need direct instruction in vocabulary, benefit from multiple repeated exposures to vocabulary words, and that the words should be derived from content-specific learning materials, among other findings.[68]

More recent research syntheses confirm the importance of vocabulary instruction. The What Works Clearinghouse's 2016 Practice Guide similarly found limited evidence, but affirmed that teachers should teach academic language, including vocabulary.[69] A meta-analysis of research on vocabulary instruction found that instruction on specific words improved reading comprehension on passages including those words (although that improvement did not generalize to text that did not include those vocabulary words).[70]

Comprehension

"Comprehension involves constructing meaning that is reasonable and accurate by connecting what has been read to what the reader already knows and thinking about all of this information until it is understood."[71] NCTQ's comprehension component in the Reading Foundations standard includes building background knowledge, comprehension strategies, and the use of interactive read alouds to build comprehension.

The National Reading Panel refers to comprehension as "the essence of reading," and asserts that comprehension is "essential not only to academic learning but to life-long learning."[72] The National Reading Panel analyzed over 200 studies focused on instruction methods on comprehension, and found 16 "effective procedures," half of which the NRP deemed to have a solid scientific foundation. As a few examples, these eight procedures include:

- "Graphic and semantic organizers that allow the reader to represent graphically (write or draw) the meanings and relationships of the ideas that underlie the words in the text."
- "Question answering in which the reader answers questions posed by the teacher and is given feedback on the correctness."
- "Summarization in which the reader attempts to identify and write the main or most important ideas that integrate or unite the other ideas or meanings of the text into a coherent whole."[73]

An Institute for Educational Sciences Practice Guide focused on building reading comprehension asserts that comprehension skills are "central not only to academic and professional success, but also

to a productive social and civic life."[74] The recommendations from this synthesis of high-quality research include:

- "Teach students how to use reading comprehension strategies," including activating prior knowledge (in which students think about what they already know on a topic), questioning (in which students develop and answer questions about a text), and retelling (in which students summarize the main points of what they read), among other strategies.
- "Teach students to identify and use the text's organizational structure to comprehend, learn, and remember content." For narrative text, elements of text structure include characters, setting, and the problem characters are trying to solve (among other elements). For informational texts, structures include sequence (the order in which events happen), cause and effect, and compare and contrast, among others.
- "Guide students through focused, high-quality discussion on the meaning of text," with questions that ask students to "locate and recall," "integrate and interpret," and "critique and evaluate."
- "Select texts purposefully to support comprehension development." These should include texts from various genres, and those that have rich content and varied word choice and sentence structure, among other features.
- "Establish an engaging and motivating context in which to teach reading comprehension," including providing the purpose for each lesson.

Many studies have focused specifically on instruction around text structures. A study looking at instruction in text structures including "sequence, comparison, causation, description, and problem-solution," taught within a social studies curriculum was associated with increased reading comprehension in a study of second grade students.[75] A review of research finds that many activities to promote reading comprehension have strong or moderate evidence, including "teaching children how to use comprehension strategies and how to utilize the organizational structure of a text."[76] Two different meta-analyses of studies focused on text structure instruction found that this instruction improved reading comprehension (although the effect size varied depending on what the comparison treatment was).[77] Another study found that instruction on text structures was specifically beneficial in supporting English language learners' reading comprehension.[78]

A growing body of research supports the importance of background knowledge in supporting a reader's understanding of a text, and so reading comprehension cannot be taught entirely through skills, but also requires teaching students a broad range of knowledge.[79]

Research on teacher preparation in scientifically based reading instruction

The research on scientifically based reading instruction for students is conclusive. However, the *Teacher Prep Review's* Reading Foundations standard focuses on instruction for aspiring teachers, not for students. This next section examines the research on teachers' and aspiring teachers' instruction in how to teach reading.

Many teachers do not complete preparation programs with a firm foundation in scientifically based reading instruction

Unfortunately, years of evidence demonstrates that enrolling in and completing a teacher preparation program does not necessarily equate to learning scientifically based reading instruction. For example, researchers have assessed the knowledge of reading instruction and language constructs for teacher educators who provide reading instruction to aspiring elementary teachers, and have found that many of these teacher educators, in the words of one study, "do not possess a good understanding of basic language constructs."[80] Another study concluded that teacher educators who teach reading instruction need additional professional development.[81] Further, research finds that the textbooks commonly required by reading courses for elementary candidates often do not adequately address the five components of reading as outlined by the National Reading Panel.[82] This insufficient knowledge among teacher educators appears to translate into insufficient knowledge among teacher candidates. A study of a sample of 2,237 preservice teachers attending a nationally representative sample of 99 institutions that prepare teachers for initial certification found that, on average, teacher candidates failed to have adequate knowledge of the five essential components of early reading instruction, correctly answering only 57% of items on a "knowledge assessment."[83]

Confirming these findings, numerous studies have surveyed practicing teachers and found substantial gaps in their knowledge of scientifically based reading instruction.[84] Other research finds that teachers often think they understand scientifically based reading instruction far better than they actually do, as demonstrated by assessments of their knowledge.[85]

Reporting by Emily Hanford has provided example after example of teachers who reach the classroom uninformed or worse, misinformed, about how to teach reading.[86] In fact, a Facebook group, "Science of Reading - What I should have learned in college" is 175,800 members strong and growing. And teachers unaware of scientifically based reading instruction often have an inflated view of their own knowledge of reading instruction; upon learning about research-based methods, they report a sense that, "I didn't know what I didn't know,"[87] and sadness that they did not serve their students better.

New research shows that balanced literacy, an approach misaligned with the science on how children learn to read, still holds sway. In the Fall of 2019, EdWeek Research Center conducted a national survey of K–2 teachers, elementary special education teachers, and postsecondary instructors who teach reading courses for teacher candidates. This survey found that:

- 68% of teachers and 57% of postsecondary instructors identify "balanced literacy" as their philosophy of teaching early reading, compared to 22% from each group who identify "explicit, systematic phonics" as their philosophy.[88] EdWeek's report explains the term "balanced literacy" saying,

  > "there is no one official definition of this approach, common components include shared reading (teacher reads aloud, students ask questions); guided reading (students gather in small, teacher-led groups to read texts meant to match their levels of ability); and independent reading (students read on their own). Although phonics can be and often is part of the approach, critics say it gives short shrift to this crucial aspect of early reading."

- While over half of teachers and teacher educators indicated that they would encourage children to sound out a word they do not know (59% and 57% respectively), more than a quarter of teachers (27%) indicated they would tell children to look at the pictures, and nearly a third of teacher educators (30%) would tell students to use context clues to make a good guess.[89] These strategies—looking at pictures and using context clues—are not supported by the research on how children learn to read (see the section on three-cueing, below, for more detail).
- Sixty-five percent of teacher educators and 75% of teachers teach the three-cueing system, which has been roundly rejected by research. This practice is more prevalent among those with *more experience* in the field (79% of those with more than 20 years of experience), but is still used by nearly half of teachers with 10 years of experience or less.[90]
- Respondents often said that they learned very little about how to teach reading from their preparation coursework; when asked where they learned most of what they know about teaching reading, less than 10% of either teachers or teacher educators identified their preservice training.[91] When asked how prepared they felt to teach early reading when they completed their teacher preparation programs, only 11% said they felt completely prepared, whereas 12% felt completely unprepared and another 23% felt somewhat unprepared.

Teachers do not necessarily fill in these knowledge gaps after they reach the classroom. A 2011 study found that teachers had low scores on measures of phonological awareness regardless of whether they were novice teachers or had more experience.[92]

Teachers' knowledge of reading matters for instructional practices and student outcomes

When aspiring teachers learn about scientifically based reading instruction, their chances of supporting their students in learning to read become much greater. Several studies have confirmed the relationship between teachers' knowledge of scientifically based reading instruction and their students' outcomes.[93] Research also finds a relationship between teachers' knowledge of components of reading instruction and their time spent teaching those components to their students.[94]

Another study adds an interesting twist to this research. This study, conducted with schools in Florida in the 2005–06 school year, used a different assessment of teachers' knowledge adapted from surveys previously used in other studies.[95] This research found that when teachers had high knowledge of scientifically based reading, *and* they spent more time on explicit decoding instruction, their students gained a great deal in reading scores. However, if teachers had *low* knowledge, the more time teachers spent on explicit decoding instruction, the weaker their student reading score gains were. This suggests that while teacher knowledge alone does not predict student outcomes (since teachers also must devote instructional time to teaching reading), having low knowledge does harm to students. The study concluded that "teachers with low knowledge scores who persisted in providing large amounts of decoding instruction tended to produce weaker reading skill growth in students than if the teacher had not provided any explicit decoding instruction at all," often because teachers provided inaccurate examples, were unable to correct student errors, and provided less varied and comprehensive instruction.[96]

Few studies have found that teachers' knowledge is *not* related to student outcomes. One study of teachers of bilingual kindergarteners found that teachers' knowledge of reading was not related to student outcomes.[97]

School districts often provide teachers with curricula that are not grounded in scientifically based reading instruction, but rather promote practices contrary to research-based instruction

Students make the greatest gains in reading when their teachers have been taught scientifically based reading instruction, *and* when their schools emphasize those reading practices. A study of Washington state focused on early-career special education teachers in grades four through eight found that, "[t]hese students tended to have larger reading gains when their district emphasized evidence based literacy decoding practices (e.g., phonological awareness, phonics, and reading

fluency) and when their special education teacher graduated from a teacher education program that also emphasized these practices."[98] When students were in districts that used balanced literacy practices, they made significantly smaller reading gains (0.055 standard deviations lower).[99] This study notes that these less effective practices were quite prevalent in Washington state; based on a survey the authors conducted,

> "about half of the special education teachers in Washington State teach in a district that emphasizes Balanced Literacy practices, and…almost 80% are in districts that emphasize guided reading, despite the fact that these practices are not supported by research."[100]

A 2019 EdWeek survey found that 72% of teachers say their schools use balanced literacy,[101] a practice misaligned with the research.[102] And some of the most popular elementary reading curricula have been widely criticized for their promotion of balanced literacy and their neglect of scientifically based reading instruction: Fountas & Pinnell Leveled Literacy Intervention[103] (used by 43% of teachers), and Units of Study for Teaching Reading/Reading Workshop by Lucy Calkins (used by 16% of teachers).[104]

EdReports, a national non-profit organization that reviews curricula, gave scores of "Does not meet expectations" to both Fountas & Pinnell Classroom (a whole-class curriculum developed by Fountas and Pinnell) and to Units of Study for their inadequate and unsystematic approach to teaching phonics and phonological skills, among other reasons. Student Achievement Partners has been similarly critical of Units of Study.[105]

Preparation in scientifically based reading instruction matters for teachers' knowledge and practice

Evidence suggests that teacher candidates exhibit a greater understanding of these concepts when their required preparation coursework explicitly focuses on these concepts[106] and when they are taught by instructors with relevant professional training.[107]

A study of 147 novice teachers found that teachers perform better on a measure of their word-structure knowledge when they had instruction in this area, and that their knowledge of aspects of word structures was correlated with their students' progress in several aspects of applying words-structure knowledge (e.g., decoding phonetically regular words).[108]

A meta-analysis of 20 studies of teacher preparation found a positive association between the preparation programs' attention to phonological and phonemic awareness and phonics, and teachers' knowledge of these areas. This analysis also found evidence of a relationship between

teachers' knowledge of reading and student literacy outcomes, finding positive effects that varied in magnitude by study.[109]

However, simply completing reading coursework as part of teacher preparation does not ensure that teachers know (or can teach) scientifically based reading instruction. For example, one study found that while teachers' scores on measures of their scientifically based reading instruction knowledge were correlated with spending more class time on related topics, there was no relationship between how they use their class time and how many reading-related courses they took. The researchers concluded that, "research-based information about reading is often not routinely or systematically covered as part of teacher preparation," motivating the need to examine the content of courses rather than simply the quantity.[110]

Content contrary to research-based practices

Many contrary practices are grounded in a well-intentioned but ultimately false understanding of how children learn to read. An early theory for the reading process was developed in the 1970s by Ken Goodman, who believed that "[s]tudents become good readers by improving their ability to predict words in text by attending to semantic, syntactic, and graphic cues."[111] Much of the reading instruction that followed focused on improving children's ability to predict words using clues such as pictures or context, rather than learning to sound out words.

To be clear, it is possible for *some* students to learn to read when taught only by these practices that run contrary to research-based reading instruction, and there has been some limited research done on these contrary practices. For example, What Works Clearinghouse (WWC) reviewed evidence on Reading Recovery, a popular intervention program typically associated with balanced literacy and whole language. This review identified 202 studies on the effects of Reading Recovery, determining that 123 did not meet the criteria to be screened by WWC and 79 did; of these 79 studies, three were randomized controlled trials that met WWC's research guidelines without reservations. (Notably, two of these three studies were authored by Gay Su Pinnell, who went on to develop another popular balanced literacy curriculum, Fountas & Pinnell.) These three studies provided evidence of "potentially positive effects" for alphabetics, fluency, and comprehension, and "positive effects" for general reading achievement.[112] However, this evidence base pales in comparison to the hundreds of studies that the National Reading Panel identified in support of the five core components of reading instruction.

However, much of the research done on Reading Recovery only followed students for a short time, through first grade. A recent research project, shared at the Spring 2022 American Educational

Research Association (AERA) Conference, followed students for several more years following their exposure to Reading Recovery. Using a regression discontinuity design (comparing students who fell just below a cutoff and so received the Reading Recovery treatment to those who fell just over a cutoff and so did not receive the treatment, the study found, "[l]ong-term impact estimates [of Reading Recovery] were significant and negative. This suggests that Reading Recovery students who scored just below the [cut scores] had 3rd and 4th grade state test scores that were about .18 to .31 standard deviations below the 3rd and 4th grade scores of students just above the [cut score] that did not participate in Reading Recovery."[113] In other words, students who received Reading Recovery support fared *worse* a few years down the line than comparable students who did not receive this support.

Little research has conclusively demonstrated that learning balanced literacy undermines children's ability to learn to read without this "psycholinguistic guessing game," as it was described by Ken Goodman, considered the father of the Whole Language approach to reading instruction. However, many believe it to be the case that trying to read by guessing words will ultimately impede on time dedicated to research-based reading instruction. For example, in an attempt to replicate some of Goodman's foundational research, Tom Nicholson learned that stronger readers make guesses and rely on context clues far less than weaker readers, and he asserted,

> "I believe that reliance on enlightened guessing…as part of the whole language approach, only confuses children….[C]hildren start well but soon reach a plateau at which words become hard to guess so that only the acquisition of decoding skills will help them read the many words they already know and understand in their listening vocabulary."[114]

NCTQ has worked with reading experts to identify a set of contrary practices that have been clearly demonstrated by research to be ineffective in teaching children to read.

Three-cueing systems

Three-cueing is defined in one study as a support for early word recognition that "[relies] on a combination of semantic, syntactic, and graphophonic cues simultaneously to formulate an intelligent hypothesis about a word's identity."[115] Three-cuing is also known as SMV or structure/meaning/visual system, and often comes in the form of prompts for children to "guess what the word might be," to "look at the picture to help guess what the word might be," to "look at the first letter to help guess what the word might be," and if they guess a word that seems to make sense, to check if it "looks right."[116]

This practice is commonly used by teachers, and research suggests it is counter-productive. A 2019 survey by EdWeek found that "75 percent of K-2 and elementary special education teachers use the

method to teach students how to read, and 65 percent of college of education professors teach it."[117] Research finds that cueing systems stand in the way of building word-recognition skills, and represents a lost opportunity to help children learn to read the word so that they do not need to guess the word in the future.[118]

One article distinguishes between the use of context clues to aid *comprehension* versus context clues to aid *word recognition*.[119] Part of the theory of using context clues in support of word recognition is that fluent readers can predict upcoming words and quickly verify their predictions; however, further research has disproven this hypothesis, finding that, "[f]luent readers are not engaging in the wholesale skipping of words, nor are they markedly reducing their sampling of visual features from the words fixated."[120]

The What Works Clearinghouse explains the problem with any strategy that encourages students to guess, saying,

> "The panel discourages teachers from allowing students to use guessing strategies to identify unfamiliar words, because these will not be effective with more-advanced texts. For example, discourage students from guessing unknown words using beginning letters or pictures. The panel also cautions against giving hints that encourage students to guess a word as if answering a riddle (e.g., "What do you call the place where you live?" if students cannot make sense of the letters h-o-m-e)."[121]

Running records

Running records are an assessment in which a teacher observes a student's oral reading of a passage and records the number of errors to calculate the accuracy level.[122] This is intended in part as a formative assessment, and uses of the data include, "identify[ing] a text level for instruction, group[ing] students for teaching, and measur[ing] and compar[ing] growth."[123] However, despite the widespread use, a study published in 2021 noted a lack of data on how reliably teachers use this assessment (in other words, whether the same student would be rated consistently among different teachers). This study of 114 teachers analyzing the same pre-recorded reading passage found wide variation in teachers' accuracy in using this assessment.[124]

Other studies have confirmed the inadequate reliability of this assessment. A study of 11 teachers found greater reliability, but only when students read eight to 10 different passages (a hugely time consuming proposition for teachers).[125] A third study found that students' reading accuracy varied across passages on the same "level" based on the content, and concluded that students need to read at least three passages to produce a reliable score.[126] A fourth study found high rates of reliability

among raters, but low rates of reliability within students; in other words, students' scores varied considerably between different books.[127]

Miscue analysis

Miscue analysis is grounded in the idea that students use clues or "cues" to determine what a word likely is, such as context, pictures, whether a word makes sense there, or whether it sounds right. When a student gets a word wrong, miscue analysis is an attempt "to uncover the strategies children use in their reading" when their reading differs from the written text (e.g., substituting "pony" for "horse").[128] Under this approach, teachers are less concerned with miscues that preserve the meaning of the text. If the meaning changes (e.g., substituting "house" for "horse"), miscue analysis suggests that students should pay more attention to context, rather than more attention to the letter patterns and positions (thus directing them away from good reading practices).[129] This focus on identifying the incorrect "cues" a student is using distracts from helping the student decode the words on the page.

Balanced literacy models

As EdWeek noted in its analysis of its national reading survey, balanced literacy has no set definition. A research study comparing balanced literacy with direct instruction (and finding that students learn more from Direct Instruction) defines balanced literacy as,

> "Balanced literacy (BL) is an approach to reading instruction that seeks to use a variety of ways to engage students with literature. BL components include reading aloud, shared readings with the whole class, small group guided reading and independent reading. Also included are a variety of writing activities such as shared and interactive writing with the whole class, [and] the use of writer's workshop which includes independent writing (Fountas and Pinnell, 2001). Central to balanced literacy curricula or sets of instructional materials, whether commercially published or constructed by teachers, is the use of leveled books and children's literature. Great care is taken to ensure students are placed in reading materials at their current instructional level. This approach is based on constructivist assumptions about the teaching of reading. **Reading skills are taught, including phonics, but within [the] context of the literature, and not responding in an explicit way.**"[130] (emphasis added)

A rather favorable review of balanced literacy defines it as,

> "a philosophical perspective…that seeks to combine, or balance, skill-based and meaning-based instruction in order to ensure positive reading and writing results in children….The balanced literacy framework is often conceptualised based on a view of scaffolded instruction, or gradual release of responsibility…where teachers provide varying levels of

> support based on children's needs….Balanced literacy instructional practices are often enacted through the use of specific instructional routines such as guided reading, shared reading, interactive writing, literacy centres and independent reading and writing."[131]

Notably, this study, intending to survey teachers on their use of balanced literacy practices, asks teachers about the relative importance of components of reading instruction (e.g., phonics, fluency), but only asks about their *use* of "balanced literacy routines" like read alouds, guided reading, shared reading, and independent reading, with no evident questions about teachers' systematic instruction in phonics, which would theoretically also be part of a balanced approach to reading instruction.[132]

The lack of balance in this study serves as a useful case study of the approach of balanced literacy more generally: it is often critiqued for an inadequate or non-systematic approach to teaching core components of reading like phonemic awareness and phonics, while privileging approaches that emphasize the use of context clues, like three-cueing.

Balanced literacy is also often framed as a compromise between the "whole language" and "phonics" approaches to reading instruction, suggesting that each approach has similar value and utility.[133]

Two of the most widely used balanced literacy curricula have recently come under scrutiny for their lack of attention to research-based reading practices. Units of Study from the Teachers College Reading & Writing Project is used by about 16% of K-2 teachers.[134] A recent analysis by Student Achievement Partners found that this program devotes too little time to phonics, recommends use of three-cueing (referred to by Units of Study as SMV or structure/meaning/visual system), does not adequately and systematically build knowledge, and does not provide sufficient supports for English language learners.[135] An analysis by EdReports found that Units of Study's attention to phonological awareness and phonics "lacks a cohesive and intentional scope and sequence" and promotes three-cueing strategies.[136]

Another popular curriculum (used by 43% of K-2 teachers[137]), Fountas and Pinnell Classroom, received similarly low marks from EdReports for its inaccurate text leveling system, lack of a research base or evidenced-based explanation of the sequence for teaching phonics, and for inadequate time on phonological awareness, phonics, and fluency (among other areas).[138]

While balanced literacy often purports to include phonics and phonemic awareness, a 2019 survey of elementary teachers found that only half (52%) defined balanced literacy as including phonics, 21% defined balanced literacy as including phonemic awareness, and 14% identified balanced literacy as including all five essential components of reading instruction.[139]

Guided reading

Guided reading (GR) is an approach to reading instruction made popular by Fountas and Pinnell. One study described this practice, as explained by Fountas and Pinnell,

> "the goal of GR is to promote students' silent, independent reading in increasingly challenging text. GR consists of small-group lessons in which the primary activity is text reading and instruction is focused primarily on reading for meaning. Groups are composed of students who are able to read text on about the same level and use similar text-processing strategies, based on ongoing observations and assessments. Students are matched with leveled text of appropriate difficulty and progress into increasingly challenging text. GR teachers teach and prompt students to use reading strategies that involve three sources of text information: meaning cues from background knowledge and text context (including cues from illustrations), cues derived from students' understanding of English syntax, and visual information derived from print, including sound-symbol relationships and sound-spellings associated with larger orthographic units such as onsets and rimes. As described by Fountas and Pinnell, word study instruction is primarily embedded in text reading and does not follow a predetermined scope and sequence. Fountas and Pinnell stated that GR should be one part of a primary-grade balanced reading program that also includes teacher read-alouds, text reading and writing in a variety of formats, and mini-lessons designed to teach how letters and words work."[140]

As described, there is a great deal of overlap between guided reading and balanced literacy, and practices such as three-cueing. A study evaluated student outcomes using guided reading compared with explicit instruction (in which teachers "provide direct explanations and modeling of concepts, skills, and strategies, along with extended opportunities for guided and independent practice with clear corrective and positive feedback" as well as synthetic phonics instruction).[141] This study, comparing results for over 200 second grade students on guided reading compared with explicit instruction, hypothesized that students would learn more through guided reading. Instead, the study found while there were not any statistically significant differences, students' reading growth was greater when taught by explicit instruction compared to guided reading for all but two variables. The study also says that explicit instruction "was associated with substantially higher value-added [measures] than [guided reading] relative to typical instruction on several variables." On phonological decoding, explicit instruction produced gains twice as great as guided reading; on two measures of comprehension, explicit instruction delivered gains four times those from guided reading (compared to typical instruction).[142]

Another study compared outcomes for first grade students taught via a "phoneme-based synthetic phonics method" computer program or taught a balanced literacy program by their teacher; students learned significantly more in phonological awareness, listening comprehension, reading comprehension, and reading fluency when learning from the phonics-based computer program.[143]

Other studies have found that specific groups of students such as English language learners benefit from explicit instruction. For example, one study compared results for over 300 first and second grade English language learner students taught by evidence-based direct instruction that included skills such as phonological and phonemic awareness and letter-sound recognition among others, with those taught by a curriculum that relied on guided reading. Students showed consistently greater gains with explicit instruction. For example, on the word identification test at the end of the study, 98-100% of students taught through direct instruction were in the benchmark range, compared with 45-48% through balanced literacy; for passage comprehension, 82-97% were in the benchmark range when taught by direct instruction, compared with 39-47% taught by balanced literacy.[144]

Reading Workshop

"Reading workshop" is the commonly used name for the Units of Study curriculum, which several reviews by reading experts have found to be misaligned with the research on how students learn to read.

Units of Study, a reading curricula for grades K-5, earned "Does not meet expectations" from EdReports' analysis of its alignment and usability. The report analysis concludes that, "[m]aterials do not include systematic and explicit instruction in all foundational skills standards to provide students with opportunities to progress towards reading proficiency. While materials include some grade-level instruction in foundational skills, the instruction contained in the Units of Study for Reading, Units of Study for Writing, and Units of Study in Phonics do not align, and at times, contradict what is occurring within each unit. The reading units mainly utilize a cueing system for solving unknown words that focus on the initial sound and meaning cues rather than on decoding strategies." The report also notes that while some instruction in foundational skills may occur in the course of the Reading Workshop, "the materials do not include explicit practice of specific skills."[145]

Student Achievement Partners has been similarly critical of Units of Study, finding that, "[o]ne of the consistent findings of the expert reviewers, however, is that following the course of Units of Study would be unlikely to lead to literacy success for all of America's public schoolchildren, given the research. Almost every expert noted that many activities designed to practice deepening reading ability were designated as optional, as was text selection itself. The "make your own adventure"

design left reviewers skeptical that crucial aspects of reading acquisition would get the time and attention required to enable all students to become secure in their reading ability."[146]

Leveled texts

A 2002 article defined leveled texts as:

> "In general, leveled text refers to reading materials that represent a progression from more simple to more complex and challenging texts. Texts that have been leveled include books created for commercial programs, selections for basal reading anthologies, and children's literature. Different text progressions use different leveling criteria. Some are based on readability formulas; others apply multiple criteria related to language predictability, text formatting, and content; still others present progressions of letter sound relationships. These progressions also reflect varying degrees of precision."[147]

Inherent in the practice of assigning leveled texts is the idea that readers have a "frustration level," a level of texts that are too difficult for them to read, an "instructional level," a level of texts that students can read with a high (but not perfect) level of accuracy with some support from their teacher, and an "independent level," a level of texts that readers can read on their own with a high level of accuracy and no support from an instructor. The premise is that reading "instructional level" texts supports students' learning. However, a recent edition of American Educator called this premise into question, asserting that the study that laid the foundation for this approach was a doctoral dissertation, and "that study neither matched books to students for instruction nor evaluated learning."[148]

Critiques of leveled texts include that they "do not follow a scope and sequence of decoding skill instruction, so there are few opportunities for students to apply and solidify phonics skills through cumulative practice," and they do not provide enough repeat exposure to phonics patterns to allow novice readers to practice them, thus encouraging new readers to guess or memorize words rather than learning to read them.[149] In fact, several studies found that students learned more when they read texts *above* their "instructional level."[150] Limiting children to books at their instructional level may also limit "their exposure to sophisticated vocabulary, rich content, and complex language."[151]

A 2007 study raised concerns about the accuracy and consistency of books' designated reading levels. This study randomly selected five books from four different designated levels of books published by the Wright Group (identified by the study as a "major publisher of early reading materials in the United States").[152] This program follows the Reading Recovery model of leveled texts and considered different criteria for leveled texts, finding some inconsistencies among books within the same level. For example, text length is based on the total number of words in the text; however,

the study found that one of the five books within one level had twice as many words as the average book in that level; at another level, two books contained about half as many words as the average in their level. The study also looked at two common measures of the grade level of texts, the Fry Readability grade level and the Flesch-Kincaid grade level, and found that the grade levels derived from these other measures were consistently higher than the grade level designated by Reading Recovery.[153] Fountas and Pinnell, the creators of Classroom, a very popular reading curriculum and approach to leveling texts, themselves acknowledge that teachers should "check to be sure that the Fountas and Pinnell level has been accurately determined. It will be frustrating to select a book and begin to use it with a group, only to find it is too easy or too difficult to support learning."[154]

Finally, anecdotal evidence calls into question the value of the leveled text approach, arguing that many students are bored by the content of books at their "just right" level and are quite capable of reading books at a higher level if the topic is of interest.[155]

Embedded/implicit phonics

There are several approaches to phonics instruction. In explicit or synthetic phonics instruction (as examined by the National Reading Panel), teachers teach sound/spelling correspondence directly and systematically. In embedded phonics instruction, "phonics instruction would be linked to, for example, reading of children's literature or other text material that children are engaging with for the purpose of developing meaning."[156] In implicit phonics instruction, "sound/spelling correspondences are inferred from reading whole words and introduced as students encounter them in text."[157]

Numerous studies have evaluated the effectiveness of embedded phonics instruction compared with systematic phonics instruction and found that students learned more through systematic phonics instruction.[158] For example, one study of 61 first grade students found that systematic phonics instruction (in this case, in the context of spelling) was more effective than embedded phonics instruction for improving children's reading, spelling, and writing; the benefits appeared to remain in measures of writing through the end of first grade and comprehension four years later.[159] Children in this study with low alphabet knowledge learned more through the systematic phonics approach than the embedded approach, although children in both groups performed similarly in learning letter-sound correspondences.

A study comparing nearly 300 first and second grade students receiving Title I services compared the outcomes of instruction in explicit phonics instruction, embedded phonics instruction, and implicit phonics instruction, and found that students made the greatest gains (in decoding and comprehension) when taught through explicit phonics instruction. The study reports, "[c]hildren

who were directly instructed in the alphabetic principle improved in word-reading skill at a significantly faster rate than children indirectly instructed in the alphabetic principle through exposure to literature," and finds that 46% and 44% of children in the implicit and embedded phonics groups respectively showed no evidence of growth, compared to only 16% of children in the explicit phonics groups. Explicit phonics was especially beneficial for students who started the year with lower phonological processing scores.[160]

Developmental Reading Assessment (DRA), Informal Reading Inventory (IRI), or Qualitative Reading Inventory (QRI)

Many assessments seek to determine students' reading level, proficiency, or areas of difficulty. One of these, **Informal Reading Inventory (IRI),** has "students read aloud from vocabulary lists or passages written to represent specific grade or developmental levels while an assessor follows along to identify errors in reading."[161] A student's reading level is the highest level at which the student can accurately read 90% to 95% of the text with "sufficient comprehension and fluency, as judged by the assessor."[162] Dating back to the 1970s, critiques of this assessment have asserted that IRIs have a great deal of measurement error, and that many versions of the IRI assessment do not include evidence of reliability data (in other words, evidence of whether ratings are consistent over time or across raters), and those that do provide this data have low levels of reliability.[163] A 2015 study conducted with a diverse group of second and third grade students found that, while the IRI assessment had a high level of inter-rater reliability, students' reading ability with actual books at their "instructional level" tended to vary widely. For example, students reading one book at the level deemed appropriate would be able to read fluently, while they had a much lower degree of accuracy with another book at the same level (which would move that book into their "frustration level"). The authors assert that these findings call into question either the designated difficulty level of the books or the ability of the assessment to accurately identify students' instructional level.[164]

Little independent research appears to support the validity or reliability of the **Developmental Reading Assessment (DRA),** which uses texts at different levels to help teachers "[d]etermine each student's independent or instructional reading level with an evaluation of three components of reading: reading engagement, oral reading fluency, and comprehension."[165] A whitepaper from Texas compared student performance on several other tests to the Developmental Reading Assessment because "teachers felt that the DRA2 did a good job of providing accurate estimates of a student's reading ability," but did not offer any other evidence of the validity or reliability of this assessment. The test developer, Pearson, does provide data about the development and reliability studies for this assessment, but did not provide citations or evidence of any peer-reviewed or published studies with more detailed data.[166]

Another reading assessment, the Qualitative Reading Inventory (QRI), "provides graded word lists and numerous passages designed to assess a student's oral reading accuracy, rate of reading and comprehension of passages read orally and silently."[167] Much of the research on the **Qualitative Reading Inventory (QRI)** compares this assessment with other reading assessments. A study comparing students' outcomes on the QRI with the Woodcock-Johnson Psycho-Educational Battery-Revised found that the assessments identified identical instructional levels for half of children, while for the other half of children, the scores resulted in a difference of at least half a year. More than 90% of the time, students earned higher scores on the Woodcock-Johnson test than on the QRI.[168] A study comparing the QRI with several other tests found that very little of the variance in students' scores on the test was due to decoding ability (less than the other three tests compared); much more of the variance was based on listening comprehension, compared with the other assessments.[169] Another study comparing the QRI, the Woodcock-Johnson, and the Gray Oral Reading Test found consistency in ratings only 43% of the time.[170]

Range of learners

Teachers need to know scientifically-based reading instruction, but also need to be able to adapt and supplement instruction to meet the needs of a variety of learners.

Struggling readers

The most recent NAEP results reveal that more than a third of fourth grade students (37%) perform below basic on reading proficiency.[171] Research conducted on tens of thousands of children and adults, readers and nonreaders alike, largely under the auspices of the National Institutes of Health, has provided the roadmap needed to slash the rate of reading failure from three in 10 children to one in 10.[172]

Simply being a struggling reader may further impede a student's ability to become more proficient. Some studies have identified a "Matthew Effect" in reading, with the idea that the rich (or in this case, the proficient readers) get richer (in this case, more proficient). Research supports this idea: in one study of first graders, "the average skilled reader reads approximately three times as many words in the group reading sessions as the average less-skilled reader."[173] This additional reading translates into substantial differences in opportunities to learn new words, as well as new content. This study explains, "the very children who are reading well and who have good vocabularies will read more, learn more word meanings, and hence read even better."[174] Supporting struggling readers and interrupting these divergent reading paths, therefore, serves an important equity goal.

For students with dyslexia and students who are poor decoders, Structured Literacy practices are often recommended; these practices include:

> "(a) explicit, systematic, and sequential teaching of literacy at multiple levels—phonemes, letter-sound relationships, syllable patterns, morphemes, vocabulary, sentence structure, paragraph structure, and text structure; (b) cumulative practice and ongoing review; (c) a high level of student-teacher interaction; (d) the use of carefully chosen examples and nonexamples; (e) decodable text; and (f) prompt, corrective feedback."[175]

Research finds that Structured Literacy is especially effective for students with dyslexia because it targets their weaknesses in phonological skills, decoding, and spelling.[176]

A common approach to support all readers, and especially struggling readers, is "Response to Intervention," or RTI. RTI models typically provide students with increasing levels of support and intervention based on their needs. However, experts note that schools may "adopt an RTI framework without embracing assessment and instruction practices that are consistent with current reading science."[177] This expert continues,

> "There is wide agreement among researchers that explicit, systematic, synthetic, code-based instruction works best. Synthetic means that students learn the sound-symbol correspondences individually and then blend them as they read syllables and whole words, and code-based means that reading instruction is organized around a defined progression of speech-to-print associations and concepts. This approach is more effective with beginning or poorly skilled readers than implicit, incidental, less structured methods."[178]

In other words, teachers and schools still need to be steeped in scientifically based reading instruction in order to effectively support struggling readers; and coherent, research based reading instruction is critical, regardless of whether it is "Tier I" or primary reading instruction, or an intervention for struggling students.

Other efforts to address students with dyslexia have treated it as an auditory and visual processing issue, and while that may be the case, there is little research to support instructional programs focused on auditory or visual issues (e.g., the Dyslexie font, a typeface that intends to ease reading and comprehension for people with dyslexia).[179]

English language learners

NAEP results reveal that only a third of English language learner (ELL) fourth grade students are scoring at or above Basic in reading.[180] Yet numerous studies have found that students who are English language learners benefit from the same scientifically based reading practices as students

who are native English speakers (for example, see the National Reading Panel's analysis of findings on phonemic awareness).[181] However, English language learners consistently fall behind their non-ELL peers in reading proficiency; in the most recent NAEP results, only 10% of fourth grade ELL students were identified as proficient or above in reading, compared with 37% of students who did not identify as English language learners.[182] This is not because of any shortcomings of the students, but rather is a result of their opportunities to learn to read.

English language learners may need some additional support. A *What Works Clearinghouse* (WWC) practice guide identified four practices as having strong evidence for supporting ELLs' reading proficiency: (1) Screening for reading problems and monitoring progress, (2) Providing intensive small-group reading interventions, (3) Providing extensive and varied vocabulary instruction, and (4) Scheduling regular peer assistant learning opportunities. The WWC guide also found low levels of evidence for a fifth practice, Developing academic English.[183] Note that the WWC guide explicitly mentions the importance of the core components of scientifically based reading instruction, stating, "the interventions should include the five core reading elements (phonological awareness, phonics, reading fluency, vocabulary, and comprehension). Explicit, direct instruction should be the primary means of instructional delivery."[184]

A report from the National Academies of Science, Engineering, and Medicine drew similar conclusions in its 2017 report on children and youth learning English. Its findings for K-5 students identified the following practices: (1) Provide explicit instruction in literacy components; (2) Develop academic language in the context of content-area instruction; (3) Provide visual and verbal supports to make; (4) core content comprehensible; (5) Encourage peer-assisted learning opportunities; (6) Capitalize on students' home language, knowledge, and cultural assets; (7) Screen for language and literacy challenges and monitor progress; and (8) Provide small-group academic support in literacy and English-language development for students.[185]

Other experts agree that while core components of scientifically based reading instruction are essential, ELLs would also benefit from additional oral language development, possibly in a targeted block of time (rather than infused throughout the school day).[186] Other successful interventions to support ELLs include "sheltered instruction" (including instructional supports such as "videos, graphic organizers, paired and group work, and interactive scaffolded discussions.")[187]

Some research has found that balanced literacy models are especially problematic for English language learners, finding that English language learners' lower English proficiency reduced their opportunities to engage in some of the discussion that native English speakers could more readily

participate in.[188] Instead, this study found that ELLs benefited from more explicit instruction and "teacher talk."[189]

Students who speak language varieties other than mainstream English

According to experts in the field, all English speakers speak some dialect of American English. A dialect that is considered non-mainstream is a "systematic, rule-governed variation from [Mainstream American English (MAE)], with different rules for expressing the same form, content, and use of a language."[190] The use of nonmainstream dialects may matter for reading ability: research has found that "the more dialect a student uses in his or her spoken or written language, the lower his or her literacy scores tend to be," that students with more "dialect production" may also have lower word identification scores,[191] and that nonmainstream American English (NMAE) is associated with differences in structural aspects of language (phonology, morphology, and syntax).[192]

Students who speak language varieties other than mainstream English may also be subject to teacher bias, and so may have fewer opportunities to learn to read successfully.[193]

Teachers are better-positioned to support students who speak language varieties other than mainstream English if they understand language variation.[194] Teachers should learn to view children's dialects as a strength, not a weakness; possessing the linguistic flexibility to "code switch" depending on the context may be a strength.[195] Instructors can draw students' attention to how language use varies by context. With proper preparation, teachers can also address potential confusion, better identify and understand error patterns, better target instruction and assessment in phonemic awareness, and better understand how nonmainstream dialects may play a role in children's understanding of the alphabetic principle.[196]

Some approaches that teacher candidates should learn include "dynamic assessment" which takes a "test-teach-retest" approach and is better suited to determine if children's reading struggles are due to a language and dialect difference or to language deficits.[197] Tasks that depend less on background knowledge, known as "processing-dependent tasks," may have less bias toward speakers of language varieties other than mainstream English.

Teachers can learn how to engage with students in strategies such as "contrastive analysis," in which they sort sentences into home or school language; "transforming," in which they identify which word would be appropriate for school language, or "formulation," in which students are given a picture and "create sentences using a target feature, such as plural -s."[198]

Research about teacher preparation practices & instructional approaches

NCTQ looks for evidence of programs' attention to scientifically based reading instruction through four instructional approaches: Instructional Hours (or course time), Objective Measures of Knowledge, Practice/Application, and Background Materials. All four instructional approaches garnered support from the field via the Open Comment Survey (see Technical Manual for more details). Available research on best practices for teacher preparation also confirms the value of each of these instructional approaches.

Instructional Hours

A literature review of research on teacher preparation's instruction on scientifically based reading instruction finds that "it is possible to increase preservice teachers' scores on assessments of technical knowledge through extensive direct instruction, either in person or prerecorded, and through specific instructional activities."[199] This study does add a caution that the validity and reliability of the assessments used to measure teachers' knowledge was not fully proven.

Objective Measures of Knowledge

Interviews with literacy teacher educators reveals that this group believes that written assignments are very valuable in preparing teacher candidates to teach reading. One study summarizes the results of over 100 interviews about teacher educators' practices and beliefs, saying, "[r]espondents recognized that "projects," "papers," and "lesson plans" were ideal learning tasks for preservice teachers to show mastery of knowledge and skills."[200]

Practice/Application

A recent article in the International Literacy Association's (ILA) *Reading Research Quarterly* journal spoke to the complexity of teachers learning how to implement scientifically based reading instruction, and advocated for preservice preparation including "more deliberate practice with tools that show them how to use SOR [science of reading] ideas in actual classrooms."[201] This article elaborates that teacher candidates should have "multiple, ongoing, authentic (i.e., in the field) opportunities to practice, be observed and receive feedback, and reflect."[202] The importance of practice opportunities was echoed by another ILA publication, suggesting that practice opportunities may help solidify candidates' knowledge of how to teach reading, though the research support for this statement was generally based on analyses of candidates offering tutoring to students (rather than, for example, practicing whole-class instruction) and was done under supervision of an expert, rather than under cooperating teachers who may have varying levels of knowledge about effective reading instruction.[203]

Another literature review identified research studies finding that teacher candidates improved on assessments of their knowledge of how to teach reading when they participated in mock-tutoring or in field experiences in which they tutor students in reading.[204]

Background Materials

Past research has found that a review of Background Materials used by teacher preparation programs is warranted. A 2009 analysis of 17 widely used textbooks required by teacher preparation programs found that many did not align with current understandings of scientifically based reading instruction.[205] Thirteen of the 17 textbooks included at least some mention of all five components recommended by the National Reading Panel, and 10 of these correctly defined each of the five components. However, coverage of these five core components ranged from 60% of one textbook to only 4% of another (and as low as 10% of coverage among those textbooks that covered all five components). Some of the textbooks were missing important elements of reading instruction. For example, one textbook, "adopted by 91 universities, did not cover phonemic awareness and fluency."[206] This study identifies the quality of textbooks as one of two factors that "may play major contributing roles in the quality of preservice teacher education (the other being the knowledge of the teacher education faculty themselves).[207]

Appendix B: Examples

This appendix provides examples drawn from real teacher preparation program reading course syllabi. The section on Background Materials illustrates the portion of the syllabus in which textbooks, articles, and other materials are identified. The sections on the other three instructional approaches provide examples of language in the syllabus for which a program would earn credit for different reading components. Examples are also provided of text from the syllabus that would not be credited toward the standard (nor would programs lose points), as the content was on topics unrelated to research-based reading instruction (e.g., a review session, a lesson plan assignment with no specified topic).

Background Materials

Example 1A. "Required Readings" section from syllabus where analysts extract textbook and Background Material information.

REQUIRED TEXTS AND/OR MATERIALS:

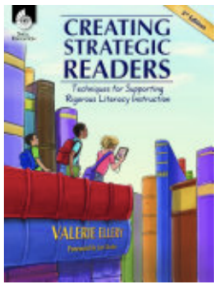
Moats, Louisa. C., (2020), *Speech To Print Language Essentials for Teachers, 3rd Edition,* Paul H. Brookes Publishing Co.

Orton-Gillingham Resource and Assessment Manuals, Mount St. Joseph University. (provided on BlackBoard).

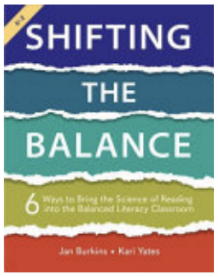
Orton-Gillingham Card Deck, Mount St. Joseph University. (provided).

Example 1B. "Required Course Materials" section from syllabus where analysts extract textbook and Background Material information.

Required Course Materials



Creating Strategic Readers: Techniques for Supporting Rigorous Literacy Instruction
9781618137838
Ellery, Valerie
Shell Education
2017-03-01



Shifting the Balance
9781625315113
Jan Miller Burkins, Kari Yates
2021-01-01

In-Class Instruction

Examples of class session descriptions credited for component coverage for each core component:

Example 2A. Class session description credited for component coverage for "phonemic awareness"

September 29	**Chapter 8: Early Literacy Phonemic Awareness Chapter 2: Understanding Phonological Awareness (Kilpatrick)**

Example 2B. Class session description credited for component coverage for "phonics"

Sept. 28	Phonics **IRA 3.1, 3.2, 3.3, 5.1** **AQTS ECH 2(c)2.(i), 2(d)2.(i), 2(d)3.(ii)** **AQTS ELE (2)(b)1.(ii)(I), (2)(b)1.(ii)(III), (2)(b)1.(ii)(VI), (2)(b)1.(iii)(III), (2)(b)1.(iii)(IV)**

Example 2C. Class session description credited for component coverage for "fluency"

20	T	10/25	Fluency 1	-Fluency Pretest -Reading Guide, *Teach Them ALL to Read*, Chapter 3
21	Th	10/27	Fluency 2	Reading Guide Review, *Teach Them ALL to Read*, Chapter 3 -K-2 Classroom Literacy Instruction Based on the Science of Reading – Fluency (LouisianaBelieves.com) -Fluency Posttest

Example 2D. Class session description credited for component coverage for "vocabulary"

10/25	Intro to vocabulary	Teaching Reading Sourcebook, p. 407-418 Putting Reading First p. 29-39
10/27	Specific Word Instruction	Teaching Reading Sourcebook, Chpt. 11

Example 2E. Class session description credited for component coverage for "comprehension"

Week 2

Wednesday – September 8

Topics: Comprehension instruction; informational texts

Assignments:

- ***Read* Informational Text Chapter 15 *in* Teaching Reading Sourcebook: *What? Why?* and *When?***
- ***Read* Chapter 4 Fostering the Cognitive Strategies of Reading Comprehension *in* Motivating Reading Comprehension: Concept-Oriented Reading Instruction *(Library ebook)***

Examples of class session descriptions credited for attention to supporting a range of learners:

Example 2F. Class session description credited for coverage for instruction on "struggling readers"

Module 3: Effective Practice with Struggling Readers		
Week 9: Mar. 7- Mar. 11 ***Mid-Terms***	What do struggling readers need?	Assign groups for this module (ECE/ElEd/SPED & Secondary/K-12) Readings depending on Group Assignment Read: Chapter 1 Rog book OR part 1, section 1 & 2 Tovani book Group based Discussion Post Group based Discussion Post Responses

Example 2G. Class session description credited for coverage for instruction on "English language learners"

Developing Language, Affirming Identities: Theories of Second Language Acquisition and Culturally Responsive Teaching	How do students develop a second language? How can we support students' English language development, while honoring their home language(s)? How do our own cultural assumptions impact our teaching and our students' learning?	**Theories of Second Language Acquisition:** Peregoy & Boyle (2013) Chapter 2 (pp. 64-81) **Translanguaging:** Garcia video AND Seltzer (2019) **Culturally Responsive/Sustaining Teaching:** Understanding Culturally Responsive Teaching

Example 2H. Class session description credited for coverage for instruction on "speakers of English language varieties other than mainstream English"

Week 6 Feb 14	Code Switching	**2/15, Group A Meet on Campus Group B Zooms** **2/17, Group B Meet on Campus, Group A Zooms** **Tuesday Pre Reading:** Delpit article on Blackboard **Thursday Pre Reading:** Code Switching Article

Example 3. Class session including content contrary to the science of reading

Week #8	**Developing Fluent Readers and Writers (MM)** 1. Definition of fluency 2. Fluency instruction 3. High frequency words 4. Fluency assessment 5. Introduction to Running Records and Miscue Analysis

Example 4. Class session description resulting in no component coverage earned

Week 15 12/10/21	**CLASS MEETING** • Lesson/Semester Reflections • Pulling everything together • Review for final exam

Objective Measures of Knowledge

Example 5. Evidence that tests, quizzes, exams or written assignments are a graded portion of the class

Student Evaluation
The breakdown of the grading for this course is as follows:

Children's television program review	10%
Language observation	10%
3 tests	30%
Skills quizzes	20%
Final Exam	20%
Class participation, WB pp., preparation of readings before class	10%
Total	**100%**

Tests, Quizzes, and Exams

Example 6. Evidence the course covers components prior to an exam

7	3/08 3/10 3/12	***Skills quiz 1*** Consonants Introduction to the central nervous system Brain maturation Brain maturation	Levey, Chapter 6
8	3/15 3/17 3/19	Language Development birth-age 3 Language Development birth-age 3 Language Development birth-age 3	Levey, Chapter 7
9	3/22 3/24 3/26	Language Development ages 3-5 Language Development ages 3-5 Phonology	Levey chapter 8 Moats Chapter 3
10	3/29 3/31 4/02	Phonological awareness Phonological awareness **Test 2**	Moats Chapter 3 Chapters 7&8

Graded, Written Assignments

Evidence of core components within assignment descriptions:

Example 7A. Example of an assignment addressing "phonemic awareness"

Phonemic Awareness Lesson Plan
Candidates will develop one phonemic awareness lesson plan based on the results of the phonemic awareness assessment and teach it to his/her student at a local elementary school. The lesson plan should include various activities and instructional strategies to meet the diverse needs of the learner and should include technology. *(*includes field experience)*

Example 7B. Example of an assignment addressing "phonics"

4. Activity Presentations (two) 18 points (9 points for each activity)	Candidates prepare activities, which support the development of word identification skills and spelling. Candidates are assigned the activities at least a week before their presentation and are given handouts to guide them in the development of the activities. Candidates present their activities in small groups, develop learning objectives, and align with Common Core State Standards (Foundational Reading strand)	**Oct. 5** **Oct. 24**

Example 7C. Example of an assignment addressing "fluency"

Assignment 3: Reading Instruction Full-Lesson Plans: Each teacher candidate will create four different lesson plans focusing on the following reading purposes: early literacy skills, phonics and word study, fluency, and vocabulary.

33 points per lesson plan X 4 132 points possible

Example 7D. Example of an assignment addressing "vocabulary"

Vocabulary presentation: (10%, Friday, May 3) You will work with a small group to become "experts" in one of the four researched-based approaches for teaching students vocabulary. As a group, you will create a one-page handout to share your strategy. You will then teach a small group the strategy, in a way that is dynamic and likely to lead to deep learning.

Example 7E. Example of an assignment addressing "comprehension"

B. **Assignment Due:** Create a 3-page study guide on the comprehension pillar. Be sure to include all major topics & the ELL perspective (25 pts).

Evidence of assignment descriptions with attention to supporting a range of learners:

Example 8. Example of an assignment addressing "struggling readers"

D. **Picture and Predictable Books for Gifted, ESL Gifted Learners, Dyslexia, and Dysgraphia Children: A Critique.** Candidates will choose three picture and predictable books featuring characters with learning disabilities. Write a paper and discuss how these books can help these children build reading fluency, vocabulary, background knowledge and interest in reading. Scan some of the illustrations and rhymes and include them in their paper to illustrate their points. Use information from Chapters 3, 4 and 7, class PowerPoints, and assigned readings to help them write this paper (please refer to course handouts). The purpose of the paper is to show readers what they notice about some of the following elements:

- Are these books appropriate for dyslexia and dysgraphia children? Are these books appropriate for gifted and gifted ESL learners and why? Will these children enjoy these books and why/why not?
- The media and artistic style used.

Example 8. Example of an assignment addressing "English language learners"

6	**Comprehension-Informational Text** Create a *comprehension* instructional lesson that focuses on informational text. Ensure that you are clear in your purpose and objective for the game/activity and that you identify appropriate source(s) of evidence of children's learning. Your plan MUST include differentiation for multiple modalities (READ Act plans, IEP goals, etc.), and clearly integrate strategies to engage English Language Learners.	40 pts.

Example 9. Example of an assignment addressing "speakers of English language varieties other than mainstream English"

2 **09/07**	**Topic: Linguistic Equity** **Activities:** 1. Read (**readings available on BB**) and take notes on the following **BEFORE this week's class**: A. Baker-Bell, A. (2020). Black Language is good on any MLK Boulevard. In Baker-Bell, A. *Linguistic justice: Black language, literacy, identity, and pedagogy*. (pp. 1-10). NCTE-Routledge. B. Young, V.A. (2018). Introduction: Are you part of the conversation? In Young, V. A., Barrett, R., Young-Rivera, Y., & Lovejoy, K. B. *Other people's English: Code-meshing, code-switching, and African American literacy.* (pp. 1-11). Parlor Press.	**Assignments/Assessments:** 1. Reading Notes A. Baker-Bell B. Young **Due: 1:00 p.m., 09/07** 2. Reflection #2 **See "Reflection Rubric" on BB.** **Due: 1:00 p.m., 09/14** 3. EPPU Dispositions Rubric (evaluation ongoing)

Example 10. Example of an assignment that does not address core components or supporting a range of learners

1) **Personal Literacy History**:
Before entering the classroom, it is helpful to reflect upon the experiences and individuals that nurtured and guided your personal literacy development. To complete this assignment, you are asked to write a **three-four page** reflection addressing your earliest memories of:

A parent or caregiver reading to you
Independent reading and writing
Literacy experiences at home, in preschool, K-4

Practice

Practice descriptions credited for core component coverage:

Example 11A. Example of practice addressing "phonemic awareness"

Thurs. 1/20	Reading Assessment Continued -PA, Letter Name Recognition, Phonics, Fluency, Vocabulary, Comprehension Assessing & Teaching Phonological Awareness -PAST, Heggerty	**Look over assessments from *Assessing Reading: Multiple Measures* from CORE website **Practice administering & scoring PAST** **PRINT CORE Phonics Survey & SAN DIEGO QUICK ASSESSMENT BEFORE TUESDAY'S CLASS**

Example 11B. Example of practice addressing "phonics"

Field Experience in a K-2 Classroom

You will engage in the following activities in a kindergarten, first, or second grade setting:

- Observe the Classroom Literacy Block. Students are required to observe a Focus Student (assigned by the classroom teacher) during the literacy block in their practicum classroom. Students are encouraged to observe as much literacy instruction as their schedule allows.
- Administer an Early Literacy Assessment. All 3301 students are required to complete a developmental spelling inventory with a student selected by the classroom teacher.
- Teach and Reflect on a Foundational Skills Lesson. Based on the results of the early literacy assessment, classroom observations, and any information provided by the teacher, 3301 students will teach a phonemic awareness or phonics lesson appropriate for their student (and 1-2 other students on the same level, if possible.)

Example 11C. Example of practice addressing "fluency"

Readings and Assignments:
Spend 30 minutes working on intervention strategy with your Reading Buddy focusing on Fluency to do in person.

Example 11D. Example of practice addressing "vocabulary"

Vocabulary Lesson Plan (150 Points): The student will develop and deliver a vocabulary lesson integrating using the 5E Model. Candidates will be presenting their lesson in small groups and a peer review will be required for this assignment.

Example 11E. Example of practice addressing "comprehension"

3. Read Aloud Lesson Plan (150 Points): You will create a standards-based lesson plan. The lesson plan must focus on comprehension. More details will be provided on Blackboard. Lessons should be taught during the designated field weeks of the course.

Practice descriptions credited for supporting a range of learners:

Example 12. Example of practice addressing "struggling readers"

2 **Four (4) Tutor Log Journal Entries:** Tutoring/Teaching Culturally Relevant Material

(15% of course grade)

Please upload to Canvas on or before April 15, 2022.

- In addition to individual and small group support, students are required to tutor a struggling reader (one or more).
- Students will journal all tutoring sessions throughout the practicum experience out of which four (4) tutor log journal entries are selected by students for submission.
- Journal entries will include the selection of texts that are relatable to your students' interests, language, and/or culture.
- A template, one example of a completed tutor log, and a scoring rubric for this submission will be provided.

Example 13. Example of practice addressing "English language learners"

> **FIELD EXPERIENCE:**
>
> You are required to have a total of ten hours of field experience for this class during the course of this semester in an inclusive general education classroom related to your certification area. Specific assignments will be linked to the field experience hours (5 Hours in general education classroom & 5 hours in an ESL/bilingual classroom or classroom with ESL students).
>
> Hours should be documented on the blue TLU Field Experience Documentation Log and through the correlating assignments. Critical Reflections would be graded based on a provided rubric. A final reflection (in the handout section of eRacer) will be completed utilizing the self-reflection template provided by the instructor in eRacer.

Example 14. Example of practice addressing "speakers of English language varieties other than mainstream English"

No examples; few programs provide practice opportunities to support this group of students, and none of the examples available were clear illustrations of the practice opportunity.

Example 15. Practice description not credited for component coverage

> **Literacy Lesson Planning, Implementation & Reflections: (180 pts)**
>
> - Running Record practices (some done in class, others homework, one in placement) (40 pts.)
> - Guided Reading Lesson: running record practice, planning, enactment, reflection (80 pts.) (done at your placement school)
> - Content Area Inquiry Writing Project & Presentation (work with Content Reading and Writing chapter, planning and materials for modeling inquiry writing, includes a presentation to the class (60 pts.)

Endnotes

[1] Definitions of, and terminology for, "elementary education" vary from state to state and impact licensure requirements. Many states define elementary education as K-6 (or preK-6) but others use different grade bands.

[2] Based on a three-year average of "Prepared by Area" figures in Title II releases from 2019-2021. Title II. (2021). *Data Tools*. Retrieved from https://title2.ed.gov/Public/Home.aspx.

[3] U.S. Department of Education, Institute of Education Sciences, National Center for Education Statistics, National Assessment of Educational Progress (NAEP). (2022). *NAEP Report Card: 2022 NAEP Reading Assessment.* Retrieved from https://www.nationsreportcard.gov/highlights/reading/2022/.

[4] National Reading Panel (U.S.), National Institute of Child Health, Human Development (US), National Reading Excellence Initiative, National Institute for Literacy (US), & United States Department of Health. (2000). *Report of the National Reading Panel: Teaching children to read: An evidence-based assessment of the scientific research literature on reading and its implications for reading instruction: Reports of the subgroups*. National Institute of Child Health and Human Development, National Institutes of Health.

[5] Foorman, B., Beyler, N., Borradaile, K., Coyne, M., Denton, C. A., Dimino, J., Furgeson, J., Hayes, L., Henke, J., Justice, L., Keating, B., Lewis, W., Sattar, S., Streke, A., Wagner, R., & Wissel, S. (2016). *Foundational skills to support reading for understanding in kindergarten through 3rd grade* (NCEE 2016-4008). Washington, DC: National Center for Education Evaluation and Regional Assistance (NCEE), Institute of Education Sciences, U.S. Department of Education. Retrieved from the NCEE website: https://ies.ed.gov/ncee/wwc/PracticeGuide/21.

[6] Gough, P. B., & Tunmer, W. E. (1986). Decoding, reading, and reading disability. *Remedial and Special Education*, *7*(1), 6-10.

[7] Duke, N. K., & Cartwright, K. B. (2021). The science of reading progresses: Communicating advances beyond the simple view of reading. *Reading Research Quarterly*, *56*, S25-S44.

[8] "Phonemic awareness" as evaluated under this standard also includes "phonological awareness."

[9] Concurrent with the Open Comment Survey on early reading instruction, NCTQ also invited responses to an Open Comment Survey on the Elementary Mathematics standard; the revised Elementary Mathematics standard was released earlier in spring 2022 and is available at: https://www.nctq.org/review/standard/Elementary-Mathematics.

[10] Note that programs' instruction on how to support a range of learners will be reported on, but will not factor into programs' grades.

[11] The open comment period ran from September 20, 2021 through October 15, 2021. State education agencies, leaders of teacher preparation programs, reading faculty at teacher preparation programs, advocacy groups, state teachers' union leaders, state school board members, state legislators on education committees, state governors' education policy advisors, superintendents, and chief academic officers of the nation's 500 largest school districts, and other potentially interested parties received an email notifying them of this opportunity to provide feedback. This list totaled over 14,000 contacts. The open comment period was also advertised through NCTQ's monthly newsletter, the *Teacher Quality Bulletin*, which has a subscriber list of 6,400 individuals.

[12] NCTQ sent the survey to state education agencies, leaders of teacher preparation programs, reading faculty at teacher preparation programs, advocacy groups, state teachers' union leaders, state school board members, state legislators on education committees, state governors' education policy advisors, superintendents, and chief academic officers of the nation's 500 largest school districts, and other

potentially interested parties received an email notifying them of this opportunity to provide feedback. This list totaled over 14,000 contacts. The open comment period was also advertised through NCTQ's monthly newsletter, the Teacher Quality Bulletin, which has a subscriber list of 6,400 individuals. We received 239 responses to the online survey, in addition to several responses emailed directly to NCTQ. The majority of respondents (69%) were from teacher preparation programs; another 8% from state education agencies, and 7% from school- or district-based staff. The rest of the respondents identified as being affiliated with a higher education institution but not a teacher preparation program (2%); another 3% identified as a member of an advocacy group, while 3% were education researchers. Most respondents (79%) reported that they have at some point helped develop reading courses for teacher candidates.

[13] The claim being evaluated is: Educator preparation programs provide elementary teacher candidates with the evidence-based content and pedagogical knowledge in reading that underlies effective and equitable reading instruction.

[14] Praxis Teaching Reading: Elementary (5205) test is used in some capacity (not necessarily for initial elementary licenses) in nine states. (Some states use several different tests.)

[15] MTEL Foundations of Reading test is used in some capacity (not necessarily for initial elementary licenses) in eight states. (Some states use several different tests.)

[16] The Praxis Teaching Reading: Elementary test also includes (a) multiple-choice items measuring Writing (contributing 13% of the overall score) and (b) three constructed-response questions (contributing 25% of the overall score). The MTEL Foundations of Reading test also includes (a) multiple-choice items measuring Reading Assessment and Instruction (contributing 18% of the overall score) and (b) two constructed-response questions (contributing 20% of the overall score).

[17] The 2020 Title 2 Report includes 1,882 IHE-based providers in academic year 2018-19. Not all providers necessarily offer elementary teacher preparation programs. Title II. (2021). *Data Tools*. Retrieved from https://title2.ed.gov/Public/Home.aspx.

[18] Foorman, B., Beyler, N., Borradaile, K., Coyne, M., Denton, C. A., Dimino, J., Furgeson, J., Hayes, L., Henke, J., Justice, L., Keating, B., Lewis, W., Sattar, S., Streke, A., Wagner, R., & Wissel, S. (2016).

[19] Phonological awareness is defined as, "the ability to recognize that words are made up of individual sound units. It is an umbrella term that is used to refer to a student's sensitivity to any aspect of phonological structure in language. It encompasses awareness of individual words in sentences, syllables, and onset–rime segments, as well as awareness of individual phonemes. Phonological awareness can also refer to the awareness of segments of sounds in words" (Foorman et al, 2016).

[20] CCSSO. (2021). *A Nation of Readers Report.* CCSSO Learning Portal. Retrieved March 2, 2022, from https://learning.ccsso.org/a-nation-of-readers.

[21] Foorman et al. (2016).

[22] Point, L. (2004). *A closer look at the five essential components of effective reading instruction: A review of scientifically based reading research for teachers*. Naperville, IL: Learning Point Associates.

[23] Point, L. (2004).

[24] "Sessions" are not the same as the number of course meetings, and instead are a reference to the number of units defined in the course schedule. As an example, a course can meet once a week and another course can meet three times a week. If the syllabus for each course is presented by weeks (as opposed to individual meetings), then the session count for both courses would be the same.

A separate team of analysts independently reviewed each syllabus to determine the amount of instructional time represented in each session. The resulting multiplier is based on the type of calendar

(daily, weekly, module, etc.), the number of credits, the total number of sessions, and the duration of each class meeting. The resulting "course multiplier" is applied to the session count to determine the number of Instructional Hours dedicated to each component.

[25] For example, the National Reading Panel's landmark study found that the core components of reading instruction were significantly more effective than "alternative" methods. See: National Reading Panel (U.S.), National Institute of Child Health, Human Development (US), National Reading Excellence Initiative, National Institute for Literacy (US), United States. Public Health Service, & United States Department of Health. (2000).

[26] Hernandez, D. J. (2011). *Double Jeopardy: How Third-Grade Reading Skills and Poverty Influence High School Graduation*. Annie E. Casey Foundation.

[27] U.S. Department of Education, Institute of Education Sciences, National Center for Education Statistics, National Assessment of Educational Progress (NAEP). (2022). *National Achievement-Level Results: Grade 4.* Retrieved from: https://www.nationsreportcard.gov/reading/nation/achievement/?grade=4.

[28] This is based on the 2022 results from the National Assessment of Educational Progress's long-term trend data, which does not report achievement levels. U.S. Department of Education, Institute of Education Sciences, National Center for Education Statistics, National Assessment of Educational Progress (NAEP), *2020 and 2022 Long-Term Trend (LTT) Reading and Mathematics Assessments.* Retrieved September 9, 2022 from https://www.nationsreportcard.gov/highlights/ltt/2022/.

[29] NCER & NCSER. (2020). Research on adult literacy: A history of investment in American adults. *Inside IES Research.* Retrieved from https://ies.ed.gov/blogs/research/post/research-on-adult-literacy-a-history-of-investment-in-american-adults

[30] U.S. Department of Education, Institute of Education Sciences, National Center for Education Statistics, National Assessment of Educational Progress (NAEP). (2022).

[31] Kuhfeld, M., Lewis, K., & Peltier, T. (2022). Reading achievement declines during the COVID-19 pandemic: evidence from 5 million US students in grades 3–8. *Reading and Writing*, 1-17; Kuhfeld, M., Soland, J., & Lewis, K. (2022). The COVID-19 school year: Learning and recovery across 2020-2021. *AERA Open*. Retrieved from https://journals.sagepub.com/doi/pdf/10.1177/23328584221099306; Dorn, E., Hancock, B., Sarakatsannis, J., & Viruleg, E. (2021). *COVID-19 and education: An emerging K-shaped recovery.* McKinsey & Company. Retrieved March 3, 2022 from https://www.mckinsey.com/industries/education/our-insights/covid-19-and-education-an-emerging-k-shaped-recovery; Halloran, C., Jack, R., Okun, J. C., & Oster, E. (2021). *Pandemic schooling mode and student test scores: Evidence from US states* (No. w29497). National Bureau of Economic Research. Retrieved from https://www.nber.org/papers/w29497; U.S. Department of Education, Institute of Education Sciences, National Center for Education Statistics, National Assessment of Educational Progress (NAEP), *2020 and 2022 Long-Term Trend (LTT) Reading and Mathematics Assessments*. Retrieved September 9, 2022 from https://www.nationsreportcard.gov/highlights/ltt/2022/.

[32] Torgesen, J. K. (2004). Preventing early reading failure. *American Educator*, *28*(3), 6-9.; Torgesen, J. K. (1998). Catch them before they fall: Identification and assessment to prevent reading failure in young children. *American Educator*, *22*(1-2), 32-39. Retrieved from: www.aft.org/sites/default/files/periodicals/torgesen.pdf; Lyon, G. R. (1998). *Overview of reading and literacy initiatives*. Report to Committee on Labor and Human Resources, U.S. Senate. Bethesda, MD: National Institute of Child Health and Human Development, National Institute of Health. Retrieved from: https://files.eric.ed.gov/fulltext/ED444128.pdf; Vellutino, F. R., Fletcher, J. M., Snowling, M. J., & Scanlon, D. M. (2004). Specific reading disability (dyslexia): What have we learned in the past four decades?. *Journal of Child Psychology and Psychiatry*, *45*(1), 2-40. Retrieved from: https://onlinelibrary.wiley.com/doi/full/10.1046/j.0021-9630.2003.00305.x.

[33] The definition presented here was created by a group of researchers and practitioners. More information is available at https://www.whatisthescienceofreading.org. The Reading League. (2021). *Science of Reading: Defining Guide.* https://www.thereadingleague.org/wp-content/uploads/2022/03/Science-of-Reading-eBook-2022.pdf.

[34] Eunice Kennedy Shriver National Institute of Child Health and Human Development, National Institutes of Health, Department of Health and Human Services. (2000). *Report of the National Reading Panel: Teaching Children to Read: Reports of the Subgroups (00-4754)*. Washington, DC: U.S. Government Printing Office. Retrieved from https://www.nichd.nih.gov/sites/default/files/publications/pubs/nrp/Documents/report.pdf.

[35] Foorman, B., Beyler, N., Borradaile, K., Coyne, M., Denton, C. A., Dimino, J., ... Wissel, S. (2016). *Foundational skills to support reading for understanding in kindergarten through 3rd grade (NCEE 2016-4008).* Washington, DC: National Center for Education Evaluation and Regional Assistance (NCEE), Institute of Education Sciences, U.S. Department of Education. Retrieved from the NCEE website: http://whatworks.ed.gov.

[36] The Reading League. (2021).

[37] Hoover, W. A., & Tunmer, W. E. (2021). The Primacy of Science in Communicating Advances in the Science of Reading. *Reading Research Quarterly.*

[38] Hoover, W. A., & Tunmer, W. E. (2021).

[39] The Reading League. (2021).

[40] Foorman, B., Beyler, N., Borradaile, K., Coyne, M., Denton, C. A., Dimino, J., Furgeson, J., Hayes, L., Henke, J., Justice, L., Keating, B., Lewis, W., Sattar, S., Streke, A., Wagner, R., & Wissel, S. (2016).

[41] Phonological awareness is defined as, "the ability to recognize that words are made up of individual sound units. It is an umbrella term that is used to refer to a student's sensitivity to any aspect of phonological structure in language. It encompasses awareness of individual words in sentences, syllables, and onset-rime segments, as well as awareness of individual phonemes. Phonological awareness can also refer to the awareness of segments of sounds in words" (Foorman et al, 2016).

[42] National Reading Panel (U.S.), National Institute of Child Health, Human Development (U.S.), National Reading Excellence Initiative, National Institute for Literacy (US), United States. Public Health Service, & United States Department of Health. (2000). *Report of the National Reading Panel: Teaching children to read: An evidence-based assessment of the scientific research literature on reading and its implications for reading instruction: Reports of the subgroups*. National Institute of Child Health and Human Development, National Institutes of Health. Retrieved from https://www.nichd.nih.gov/sites/default/files/publications/pubs/nrp/Documents/report.pdf.

[43] Petscher, Y., Cabell, S. Q., Catts, H. W., Compton, D. L., Foorman, B. R., Hart, S. A., ... & Wagner, R. K. (2020). How the science of reading informs 21st-century education. *Reading Research Quarterly*, *55*, S267-S282.

[44] Melby-Lervåg, M., Lyster, S. A. H., & Hulme, C. (2012). Phonological skills and their role in learning to read: a meta-analytic review. *Psychological Bulletin*, *138*(2), 322.

[45] National Reading Panel (U.S.), National Institute of Child Health, Human Development (U.S.), National Reading Excellence Initiative, National Institute for Literacy (U.S.), United States. Public Health Service, & United States Department of Health. (2000). *Report of the National Reading Panel: Teaching children to read: An evidence-based assessment of the scientific research literature on reading and its implications for reading instruction: Reports of the subgroups*. National Institute of Child Health and Human Development, National Institutes of Health. Retrieved from https://www.nichd.nih.gov/sites/default/files/publications/pubs/nrp/Documents/report.pdf.

[46] National Reading Panel (U.S.), National Institute of Child Health, Human Development (U.S.), National Reading Excellence Initiative, National Institute for Literacy (U.S.), United States. Public Health Service, & United States Department of Health. (2000)

[47] CCSSO. (2021).

[48] National Reading Panel (U.S.), National Institute of Child Health, Human Development (U.S.), National Reading Excellence Initiative, National Institute for Literacy (U.S.), United States. Public Health Service, & United States Department of Health. (2000).

[49] National Reading Panel (U.S.), National Institute of Child Health, Human Development (U.S.), National Reading Excellence Initiative, National Institute for Literacy (U.S.), United States. Public Health Service, & United States Department of Health. (2000).

[50] National Reading Panel (U.S.), National Institute of Child Health, Human Development (U.S.), National Reading Excellence Initiative, National Institute for Literacy (U.S.), United States. Public Health Service, & United States Department of Health. (2000).

[51] Adams, M. J., Fillmore, L. W., Goldenberg, C., Oakhill, J., Paige, D. D., Rasinski, T., & Shanahan, T. (2020). Comparing reading research to program design: An examination of Teachers College Units of Study. *Student Achievement Partners*, 1-64.

[52] Ehri, L. C. (2020). The science of learning to read words: A case for systematic phonics instruction. *Reading Research Quarterly*, *55*, S45-S60.

[53] Galuschka, K., Ise, E., Krick, K., & Schulte-Körne, G. (2014). Effectiveness of treatment approaches for children and adolescents with reading disabilities: A meta-analysis of randomized controlled trials. *PLoS One*, *9*(2), e89900.

[54] McArthur, G., Sheehan, Y., Badcock, N. A., Francis, D. A., Wang, H. C., Kohnen, S., ... & Castles, A. (2018). Phonics training for English-speaking poor readers. *Cochrane Database of Systematic Reviews*, (11). Retrieved from https://www.cochranelibrary.com/cdsr/doi/10.1002/14651858.CD009115.pub3/pdf/full.

[55] Machin, S. J., McNally, S., & Viarengo, M. (2016). *'Teaching to Teach' Literacy*. Institute for the Study of Labor (IZA), Research Paper Series. Discussion Paper No. 9955.

[56] See, for example, the response to a recent podcast about reading instruction, *Sold a Story*, a group of deans and teacher educators co-signed a letter accusing the podcast (and more broadly the "science of reading") of "reduc[ing] the teaching of reading to phonics instruction and nothing more." Letter to the editor. (2022). Opinion: A call for rejecting the newest reading wars. *The Hechinger Report*. Retrieved November 21, 2022 from https://hechingerreport.org/opinion-a-call-for-rejecting-the-newest-reading-wars/.

[57] Ehri, L. C. (2020).

[58] National Reading Panel (U.S.), National Institute of Child Health, Human Development (U.S.), National Reading Excellence Initiative, National Institute for Literacy (U.S.), United States. Public Health Service, & United States Department of Health. (2000).

[59] Point, L. (2004).

[60] National Reading Panel (U.S.), National Institute of Child Health, Human Development (U.S.), National Reading Excellence Initiative, National Institute for Literacy (U.S.), United States. Public Health Service, & United States Department of Health. (2000).

[61] Foorman, B., Beyler, N., Borradaile, K., Coyne, M., Denton, C. A., Dimino, J., Furgeson, J., Hayes, L., Henke, J., Justice, L., Keating, B., Lewis, W., Sattar, S., Streke, A., Wagner, R., & Wissel, S. (2016).

[62] White, S., Sabatini, J., Park, B. J., Chen, J., Bernstein, J., and Li, M. (2021). *Highlights of the 2018 NAEP Oral Reading Fluency Study (NCES 2021-026).* U.S. Department of Education. Washington, DC: Institute of Education Sciences, National Center for Education Statistics. Retrieved from https://nces.ed.gov/pubsearch/pubsinfo.asp?pubid=2021026.

[63] Rasinski, T. V., Chang, S. C., Edmondson, E., Nageldinger, J., Nigh, J., Remark, L., ... & Rupley, W. H. (2017). Reading fluency and college readiness. *Journal of Adolescent & Adult Literacy*, *60*(4), 453-460.

[64] Petscher, Y., Solari, E. J., & Catts, H. W. (2019). Conditional longitudinal relations of elementary literacy skills to high school reading comprehension. *Journal of Learning Disabilities*, *52*(4), 324-336.

[65] Foorman, B., Beyler, N., Borradaile, K., Coyne, M., Denton, C. A., Dimino, J., Furgeson, J., Hayes, L., Henke, J., Justice, L., Keating, B., Lewis, W., Sattar, S., Streke, A., Wagner, R., & Wissel, S. (2016).

[66] The What Works Clearinghouse Practice Guide explains, "Academic vocabulary consists of words that are common in writing and other formal settings and that students need to learn to understand written text. They include words that frequently appear in instructions for assignments and activities across subject areas, such as listen, group, locate, define, select, contrast, estimate, and concentrate. Academic vocabulary can also include syntax (grammatical rules) uncommon in speech, such as the phrase *away they went*." These words can also be discipline- or subject-specific. Foorman, B., Beyler, N., Borradaile, K., Coyne, M., Denton, C. A., Dimino, J., Furgeson, J., Hayes, L., Henke, J., Justice, L., Keating, B., Lewis, W., Sattar, S., Streke, A., Wagner, R., & Wissel, S. (2016).

[67] National Reading Panel (US), National Institute of Child Health, Human Development (US), National Reading Excellence Initiative, National Institute for Literacy (US), United States. Public Health Service, & United States Department of Health. (2000).

[68] National Reading Panel (US), National Institute of Child Health, Human Development (US), National Reading Excellence Initiative, National Institute for Literacy (US), United States. Public Health Service, & United States Department of Health. (2000).

[69] Foorman, B., Beyler, N., Borradaile, K., Coyne, M., Denton, C. A., Dimino, J., Furgeson, J., Hayes, L., Henke, J., Justice, L., Keating, B., Lewis, W., Sattar, S., Streke, A., Wagner, R., & Wissel, S. (2016).

[70] Wright, T. S., & Cervetti, G. N. (2017). A systematic review of the research on vocabulary instruction that impacts text comprehension. *Reading Research Quarterly*, *52*(2), 203-226.

[71] Point, L. (2004). *A closer look at the five essential components of effective reading instruction: A review of scientifically based reading research for teachers*. Naperville, IL: Learning Point Associates.

[72] National Reading Panel (US), National Institute of Child Health, Human Development (US), National Reading Excellence Initiative, National Institute for Literacy (US), United States. Public Health Service, & United States Department of Health. (2000).

[73] National Reading Panel (US), National Institute of Child Health, Human Development (US), National Reading Excellence Initiative, National Institute for Literacy (US), United States. Public Health Service, & United States Department of Health. (2000).

[74] Shanahan, T., Callison, K., Carriere, C., Duke, N. K., Pearson, P. D., Schatschneider, C., & Torgesen, J. (2010). *Improving reading comprehension in kindergarten through 3rd grade: A practice guide (NCEE 2010-4038)*. Washington, DC: National Center for Education Evaluation and Regional Assistance, Institute of Education Sciences, U.S. Department of Education. Retrieved from whatworks.ed.gov/publications/practiceguides.

[75] Williams, J. P., Kao, J. C., Pao, L. S., Ordynans, J. G., Atkins, J. G., Cheng, R., & DeBonis, D. (2016). Close analysis of texts with structure (CATS): An intervention to teach reading comprehension to at-risk second

graders. *Journal of Educational Psychology, 108*(8), 1061.

[76] Petscher, Y., Cabell, S. Q., Catts, H. W., Compton, D. L., Foorman, B. R., Hart, S. A., ... & Wagner, R. K. (2020).

[77] Hebert, M., Bohaty, J. J., Nelson, J. R., & Brown, J. (2016). The effects of text structure instruction on expository reading comprehension: A meta-analysis. *Journal of Educational Psychology*, *108*(5), 609; Pyle, N., Vasquez, A. C., Lignugaris/Kraft, B., Gillam, S. L., Reutzel, D. R., Olszewski, A., ... & Pyle, D. (2017). Effects of expository text structure interventions on comprehension: A meta-analysis. *Reading Research Quarterly*, *52*(4), 469-501.

[78] Wijekumar, K., Meyer, B. J., Lei, P., Hernandez, A. C., & August, D. L. (2018). Improving content area reading comprehension of Spanish speaking English learners in Grades 4 and 5 using web-based text structure instruction. *Reading and Writing*, *31*(9), 1969-1996.

[79] Petscher, Y., Cabell, S. Q., Catts, H. W., Compton, D. L., Foorman, B. R., Hart, S. A., ... & Wagner, R. K. (2020); Connor, C. M., Dombek, J., Crowe, E. C., Spencer, M., Tighe, E. L., Coffinger, S., ... & Petscher, Y. (2017). Acquiring science and social studies knowledge in kindergarten through fourth grade: Conceptualization, design, implementation, and efficacy testing of content-area literacy instruction (CALI). *Journal of Educational Psychology*, *109*(3), 301; Kim, J. S., Burkhauser, M. A., Mesite, L. M., Asher, C. A., Relyea, J. E., Fitzgerald, J., & Elmore, J. (2021). Improving reading comprehension, science domain knowledge, and reading engagement through a first-grade content literacy intervention. *Journal of Educational Psychology*, *113*(1), 3; Smith, R., Snow, P., Serry, T., & Hammond, L. (2021). The role of background knowledge in reading comprehension: A critical review. *Reading Psychology*, *42*(3), 214-240.

[80] Binks-Cantrell, E., Washburn, E. K., Joshi, R. M., & Hougen, M. (2012). Peter effect in the preparation of reading teachers. *Scientific Studies of Reading*, *16*(6), 526-536.

[81] Joshi, R. M., Binks, E., Hougen, M., Dahlgren, M. E., Ocker-Dean, E., & Smith, D. L. (2009). Why elementary teachers might be inadequately prepared to teach reading. *Journal of Learning Disabilities*, *42*(5), 392-402.

[82] Joshi, R. M., Binks, E., Graham, L., Ocker-Dean, E., Smith, D. L., & Boulware-Gooden, R. (2009). Do textbooks used in university reading education courses conform to the instructional recommendations of the National Reading Panel? *Journal of Learning Disabilities*, *42*(5), 458-463.

[83] Salinger, T., et al. (2010). *Study of teacher preparation in early reading instruction*. Washington, DC: National Center for Education Evaluation and Regional Assistance, Institute of Education Sciences, U.S. Department of Education. Retrieved from http://ies.ed.gov/ncee/pubs/20104036/pdf/20104036.pdf.

[84] For example, Moats, L. (2009). Knowledge foundations for teaching reading and spelling. *Reading and Writing*, *22*(4), 379-399; Lane, H. B., Hudson, R. F., Leite, W. L., Kosanovich, M. L., Strout, M. T., Fenty, N. S., & Wright, T. L. (2008). Teacher knowledge about reading fluency and indicators of students' fluency growth in reading first schools. *Reading & Writing Quarterly*, *25*(1), 57-86; Washburn, E. K., Joshi, R. M., & Binks-Cantrell, E. S. (2011). Teacher knowledge of basic language concepts and dyslexia. *Dyslexia*, *17*(2), 165-183; Cheesman, E. A., McGuire, J. M., Shankweiler, D., & Coyne, M. (2009). First-year teacher knowledge of phonemic awareness and its instruction. *Teacher Education and Special Education*, *32*(3), 270-289.

[85] Rutherford, A., Carter, L., Riley, M., & Platt, S. (2017). Content knowledge reading assessment: A policy change impacting elementary education candidates' preparation. *Research in Higher Education Journal*, *33*. Retrieved from https://files.eric.ed.gov/fulltext/EJ1161490.pdf

[86] Hanford, E. (2018). Hard words: Why aren't kids being taught to read. *APM Reports*, 9-16; Hanford, E. (2019). At a loss for words: How a flawed idea is teaching millions of kids to be poor readers. *APM Reports*;

Hanford, E. (2020). What the words say: Many kids struggle with reading—and children of color are far less likely to get the help they need. *APM Reports*.

[87] Cunningham, A.E., Perry, K. E., Stanovich, K. E., & Stanovich, P. (2004). Disciplinary knowledge of K-3 teachers and their knowledge calibration in the domain of early literacy. *Annals of Dyslexia*, *54*(1), 139–167.

[88] Kurtz, H., Lloyd, S., Harwin, A., Chen, V., & Furuya, Y. (2020). Early reading instruction: Results of a national survey. *Editorial Projects in Education*.

[89] Kurtz, H., Lloyd, S., Harwin, A., Chen, V., & Furuya, Y. (2020).

[90] Kurtz, H., Lloyd, S., Harwin, A., Chen, V., & Furuya, Y. (2020).

[91] Kurtz, H., Lloyd, S., Harwin, A., Chen, V., & Furuya, Y. (2020).

[92] Washburn, E. K., Joshi, R. M., & Binks-Cantrell, E. S. (2011).

[93] McCutchen, D., Green, L., Abbott, R. D., & Sanders, E. A. (2009). Further evidence for teacher knowledge: Supporting struggling readers in grades three through five. *Reading and Writing*, *22*(4), 401-423. Retrieved from https://www.researchgate.net/profile/Laura-Green-30/publication/225420616_Further_evidence_for_teacher_knowledge_Supporting_struggling_readers_in_grades_three_through_five/links/00b7d521babc49242a000000/Further-evidence-for-teacher-knowledge-Supporting-struggling-readers-in-grades-three-through-five.pdf; Hudson, A. K., Moore, K. A., Han, B., Wee Koh, P., Binks-Cantrell, E., & Joshi, R.M. (2021). Elementary teachers' knowledge of foundational literacy skills: A critical piece of the puzzle in the science of reading. *Reading Research Quarterly*, *56*, S287-S315; Moats, L. C., & Foorman, B. R. (2003). Measuring teachers' content knowledge of language and reading. *Annals of Dyslexia*, *53*(1), 23-45.

[94] Spear-Swerling, L., & Zibulsky, J. (2014). Making time for literacy: Teacher knowledge and time allocation in instructional planning. *Reading and Writing, 27*(8), 1353-1378.

[95] Piasta, S. B., Connor, C. M., Fishman, B. J., & Morrison, F. J. (2009). Teachers' knowledge of literacy concepts, classroom practices, and student reading growth. *Scientific Studies of Reading*, *13*(3), 224-248.

[96] Piasta et al. reached these conclusions about the causes of weaker student growth based on observations of teachers with low levels of reading knowledge.

[97] Cirino, P. T., Pollard-Durodola, S. D., Foorman, B. R., Carlson, C. D., & Francis, D. J. (2007). Teacher characteristics, classroom instruction, and student literacy and language outcomes in bilingual kindergartners. *The Elementary School Journal*, *107*(4), 341-364. https://uh-ir.tdl.org/bitstream/handle/10657/2260/Cirino_2007_TeacherCharacteristics.pdf?sequence=1&isAllowed=y.

[98] Theobald, R. J., Goldhaber, D. D., Holden, K. L., & Stein, M. L. (2022). Special education teacher preparation, literacy instructional alignment, and reading achievement for students with high-incidence disabilities. *Exceptional Children*, 00144029221081236.

[99] Theobald, R. J., Goldhaber, D. D., Holden, K. L., & Stein, M. L. (2022).

[100] Theobald, R. J., Goldhaber, D. D., Holden, K. L., & Stein, M. L. (2022).

[101] EdWeek describes balanced literacy, saying "common components include shared reading (teacher reads aloud, students ask questions); guided reading (students gather in small, teacher-led groups to read texts meant to match their levels of ability); and independent reading (students read on their own). Although phonics can be and often is part of the approach, critics say it gives short shrift to this crucial aspect of early reading."; Kurtz, H., Lloyd, S., Harwin, A., Chen, V., & Furuya, Y. (2020). Early Reading Instruction: Results of a National Survey. *Editorial Projects in Education*.

[102] Kurtz, H., Lloyd, S., Harwin, A., Chen, V., & Furuya, Y. (2020).

[103] Fountas & Pinnell Leveled Literacy Intervention refers to a targeted intervention program developed by Fountas & Pinnell; however, Fountas & Pinnell also produce a whole-class curriculum (titled "Classroom"). The survey item, which asks teachers about what core or supplemental reading programs they use in their classroom, does not list other Fountas & Pinnell products among the responses, and so it is possible that teachers identified Leveled Literacy Intervention even if they were using another Fountas & Pinnell curriculum.

[104] Kurtz, H., Lloyd, S., Harwin, A., Chen, V., & Furuya, Y. (2020).

[105] EdReports. (2020). *Fountas & Pinnel Classroom*. Retrieved from: https://www.edreports.org/reports/detail/fountas-pinnell-classroom-2020/kindergarten/gateway-one; EdReports. (2018). *Units of Study.* Retrieved from: https://www.edreports.org/reports/detail/units-of-study-2018/kindergarten/gateway-one; Adams, M. J., Fillmore, L. W., Goldenberg, C., Oakhill, J., Paige, D. D., Rasinski, T., & Shanahan, T. (2020).

[106] Clark, S. K., Helfrich, S. R., & Hatch, L. (2015). Examining preservice teacher content and pedagogical content knowledge needed to teach reading in elementary school. *Journal of Research in Reading*, *40*, 219-232. doi: 10.1111/1467-9817.12057.

[107] Binks-Cantrell, E., Washburn, E. K., Malatesha Joshi, R., & Hougen, M. (2012).

[108] Spear-Swerling, L., & Brucker, P. O. (2004). Preparing novice teachers to develop basic reading and spelling skills in children. *Annals of dyslexia*, *54*(2), 332-364.

[109] Hudson, A. K., Moore, K. A., Han, B., Wee Koh, P., Binks-Cantrell, E., & Malatesha Joshi, R. (2021).

[110] Spear-Swerling, L., & Zibulsky, J. (2014).

[111] Ehri, L. C. (2020).

[112] U.S. Department of Education, Institute of Education Sciences, What Works Clearinghouse. (2013). *Beginning Reading intervention report: Reading Recovery®*. Retrieved from http://whatworks.ed.gov.

[113] May, H., Blakeney, A., Shrestha, P., Mazal, M., & Kennedy, N. (2022). *READING RECOVERY: Long-Term Effects and Cost-Effectiveness Under the Investing in Innovation (i3) Scale-Up* [Conference Presentation]. American Education Research Association (AERA) 2022 Conference. San Diego, CA, United States. Retrieved from https://drive.google.com/drive/folders/1R4eZlidReG-1zFA4LKL9nX9sPbkM-t0q

[114] Nicholson, T. (1991). Do children read words better in context or in lists? A classic study revisited. *Journal of Educational Psychology*, *83*(4), 444.

[115] Petscher, Y., Cabell, S. Q., Catts, H. W., Compton, D. L., Foorman, B. R., Hart, S. A., ... & Wagner, R. K. (2020). How the science of reading informs 21st-century education. *Reading Research Quarterly*, *55*, S267-S282.

[116] Hempenstall, K. (2006). The three-cueing model: Down for the count? *Education News.*

[117] Schwartz, S. (2020). Is this the end of 'three cueing'? *Education Week.* Retrieved November 3, 2022 from https://www.edweek.org/teaching-learning/is-this-the-end-of-three-cueing/2020/12.

[118] Petscher, Y., Cabell, S. Q., Catts, H. W., Compton, D. L., Foorman, B. R., Hart, S. A., ... & Wagner, R. K. (2020); Hempenstall, K. (2006).

[119] Stanovich, K. E. (2009). Matthew effects in reading: Some consequences of individual differences in the acquisition of literacy. *Journal of Education*, *189*(1-2), 23-55.

[120] Stanovich, K. E. (2009).

[121] Foorman, B., Beyler, N., Borradaile, K., Coyne, M., Denton, C. A., Dimino, J., Furgeson, J., Hayes, L., Henke, J., Justice, L., Keating, B., Lewis, W., Sattar, S., Streke, A., Wagner, R., & Wissel, S. (2016).

[122] Rodgers, E., D'Agostino, J. V., Berenbon, R., Johnson, T., & Winkler, C. (2021). Scoring Running Records: Complexities and affordances. *Journal of Early Childhood Literacy*, 14687984211027198; D'Agostino, J. V., Rodgers, E., Winkler, C., Johnson, T., & Berenbon, R. (2021). The generalizability of running record accuracy and self-correction scores. *Reading Psychology*, *42*(2), 111-130.

[123] Rodgers, E., D'Agostino, J. V., Berenbon, R., Johnson, T., & Winkler, C. (2021).

[124] Rodgers, E., D'Agostino, J. V., Berenbon, R., Johnson, T., & Winkler, C. (2021).

[125] D'Agostino, J. V., Rodgers, E., Winkler, C., Johnson, T., & Berenbon, R. (2021).

[126] Fawson, P. C., Ludlow, B. C., Reutzel, D. R., Sudweeks, R., & Smith, J. A. (2006). Examining the reliability of running records: Attaining generalizable results. *The Journal of Educational Research*, *100*(2), 113-126.

[127] D'Agostino, J. V., Rodgers, E., Winkler, C., Johnson, T., & Berenbon, R. (2021).

[128] Hempenstall, K. (2006). The three-cueing model: Down for the count? *Education News.*

[129] Hempenstall, K. (2006).

[130] Robinson, L., Lambert, M. C., Towner, J., & Caros, J. (2016). A comparison of direct instruction and balanced literacy: An evaluative comparison for a pacific northwest rural school district. *Reading Improvement*, *53*(4), 147-164.

[131] Bingham, G. E., & Hall-Kenyon, K. M. (2013). Examining teachers' beliefs about and implementation of a balanced literacy framework. *Journal of Research in Reading*, *36*(1), 14-28.

[132] Bingham, G. E., & Hall-Kenyon, K. M. (2013).

[133] Wren, S. (2001). What does a balanced literacy approach mean. *Topics in early reading coherence*.

[134] Schwartz, S. (2021). New curriculum review gives failing marks to two popular reading programs. *Education Week.* Retrieved November 3, 2022 from https://www.edweek.org/teaching-learning/new-curriculum-review-gives-failing-marks-to-popular-early-reading-programs/2021/11.

[135] Adams, M. J., Fillmore, L. W., Goldenberg, C., Oakhill, J., Paige, D. D., Rasinski, T., & Shanahan, T. (2020).

[136] Schwartz, S. (2021).

[137] Schwartz, S. (2021).

[138] Schwartz, S. (2021).

[139] Kurtz, H., Lloyd, S., Harwin, A., Chen, V., & Furuya, Y. (2020).

[140] Denton, C. A., Fletcher, J. M., Taylor, W. P., Barth, A. E., & Vaughn, S. (2014). An experimental evaluation of guided reading and explicit interventions for primary-grade students at-risk for reading difficulties. *Journal of Research on Educational Effectiveness*, *7*(3), 268-293.

[141] Denton, C. A., Fletcher, J. M., Taylor, W. P., Barth, A. E., & Vaughn, S. (2014).

[142] Denton, C. A., Fletcher, J. M., Taylor, W. P., Barth, A. E., & Vaughn, S. (2014).

[143] Savage, R. S., Abrami, P., Hipps, G., & Deault, L. (2009). A randomized controlled trial study of the ABRACADABRA reading intervention program in grade 1. *Journal of Educational Psychology*, *101*(3), 590.

[144] Kamps, D., Abbott, M., Greenwood, C., Arreaga-Mayer, C., Wills, H., Longstaff, J., ... & Walton, C. (2007). Use of evidence-based, small-group reading instruction for English language learners in elementary grades: Secondary-tier intervention. *Learning Disability Quarterly*, *30*(3), 153-168.

[145] EdReports. (2018). *Units of Study.* Retrieved from: https://www.edreports.org/reports/detail/units-of-study-2018/kindergarten/gateway-one.

[146] Fillmore, L. W., Goldenberg, C., Oakhill, J., Paige, D. D., Rasinski, T., & Shanahan, T. (2020).

[147] Brabham, E. G., & Villaume, S. K. (2002). Leveled text: the good news and the bad news. Questions and Answers. *The Reading Teacher*, *55*(5), 438-442.

[148] Shanahan, T. (2020). Limiting Children to Books They Can Already Read: Why It Reduces Their Opportunity to Learn. *American Educator*, *44*(2), 13.

[149] Moats, L. C. (2017). Can prevailing approaches to reading instruction accomplish the goals of RTI. *Perspectives on Language and Literacy*, *43*(3), 15-22.

[150] Shanahan, T. (2020); Brown, L. T., Mohr, K. A., Wilcox, B. R., & Barrett, T. S. (2018). The effects of dyad reading and text difficulty on third-graders' reading achievement. *The Journal of Educational Research*, *111*(5), 541-553; Morgan, A., Wilcox, B. R., & Eldredge, J. L. (2000). Effect of difficulty levels on second-grade delayed readers using dyad reading. *The Journal of Educational Research*, *94*(2), 113-119.

[151] Shanahan, T. (2020).

[152] Pitcher, B., & Fang, Z. (2007). Can we trust levelled texts? An examination of their reliability and quality from a linguistic perspective. *Literacy*, *41*(1), 43-51.

[153] Pitcher, B., & Fang, Z. (2007).

[154] Fountas, I. C., & Pinnell, G. S. (2012). Guided reading: The romance and the reality. *The Reading Teacher*, *66*(4), 268-284.

[155] D'Souza, K. (2022). *'Just-right' books: Does leveled reading hurt the weakest readers*? EdSource Special Report. Retrieved November 15, 2022 from https://edsource.org/2022/just-right-books-does-leveled-reading-hurt-the-weakest-readers/680958.

[156] Roberts, T. A., & Meiring, A. (2006). Teaching phonics in the context of children's literature or spelling: Influences on first-grade reading, spelling, and writing and fifth-grade comprehension. *Journal of Educational Psychology*, *98*(4), 690.

[157] Read Naturally. (2022). *Phonics*. Retrieved from https://www.readnaturally.com/research/5-components-of-reading/phonics.

[158] Roberts, T. A., & Meiring, A. (2006); Chall, J. S. (1983). *Learning to read: The great debate*. New York: McGraw-Hill; Torgeson, J., Wagner, R., Rashotte, C., Rose, E., Lindamood, P., Conway, T., & Garven, C. (1999). Preventing reading failure in young children with phonological processing disabilities: Group and individual responses to instruction. *Journal of Educational Psychology, 91*, 579-593; Center, Y., Freeman, L., & Robertson, G. (2001). The relative effect of a code-oriented and meaning-oriented early literacy program on regular and low progress Australian students in Year 1 classrooms which implement reading recovery. *International Journal of Disability, Development and Education, 48*, 207-232; Christensen, C. A., & Bowey, J. A. (2005). The efficacy of orthographic rime, grapheme–phoneme correspondence, and implicit phonics approaches to teaching decoding skills. *Scientific Studies of Reading, 9*, 327-349.

[159] Roberts, T. A., & Meiring, A. (2006).

[160] Foorman, B. R., Francis, D. J., Fletcher, J. M., Schatschneider, C., & Mehta, P. (1998). The role of

instruction in learning to read: Preventing reading failure in at-risk children. *Journal of Educational Psychology*, *90*(1), 37.

[161] Burns, M. K., Pulles, S. M., Maki, K. E., Kanive, R., Hodgson, J., Helman, L. A., ... & Preast, J. L. (2015). Accuracy of student performance while reading leveled books rated at their instructional level by a reading inventory. *Journal of School Psychology*, *53*(6), 437-445.

[162] Burns, M. K., Pulles, S. M., Maki, K. E., Kanive, R., Hodgson, J., Helman, L. A., ... & Preast, J. L. (2015).

[163] Burns, M. K., Pulles, S. M., Maki, K. E., Kanive, R., Hodgson, J., Helman, L. A., ... & Preast, J. L. (2015).

[164] Burns, M. K., Pulles, S. M., Maki, K. E., Kanive, R., Hodgson, J., Helman, L. A., ... & Preast, J. L. (2015).

[165] Pearson. (2019). *DRA3: Reading opens up a world of possibilities.* Pearson. Retrieved from https://www.pearsonassessments.com/content/dam/school/global/clinical/us/assets/dra3/dra3-information-sheet.pdf.

[166] Altman, R. (2019). *The Research Behind the DRA3 Benchmark Assessments Overview.* Pearson. Retrieved from https://www.pearsonassessments.com/content/dam/school/global/clinical/us/assets/dra3/the-research-behind-the-dra3-benchmark-assessments-whitepaper.pdf.

[167] Pearson. (2021). Qualitative Reading Inventory, 7th edition. *Pearson*. Retrieved from https://www.pearsonassessments.com/content/dam/school/global/clinical/us/assets/dra3/the-research-behind-the-dra3-benchmark-assessments-whitepaper.pdf.

[168] P. McCabe, Margolis, H., Barenbaum, E. P., (2001). A comparison of Woodcock-Johnson Psycho-Educational Battery-Revised and Qualitative Reading Inventory-II instructional reading levels. *Reading & Writing Quarterly*, *17*(4), 279-289.

[169] Keenan, J. M., Betjemann, R. S., & Olson, R. K. (2008). Reading comprehension tests vary in the skills they assess: Differential dependence on decoding and oral comprehension. *Scientific Studies of Reading*, *12*(3), 281-300.

[170] Keenan, J. M., & Meenan, C. E. (2014). Test differences in diagnosing reading comprehension deficits. *Journal of Learning Disabilities*, *47*(2), 125-135.

[171] U.S. Department of Education, Institute of Education Sciences, National Center for Education Statistics, National Assessment of Educational Progress (NAEP). (2022). *National Achievement-Level Results: Grade 4.* Retrieved from https://www.nationsreportcard.gov/reading/nation/achievement/?grade=4.

[172] Torgesen, J. K. (2004).; Torgesen, J. K. (1998); Lyon, G. R. (1998); Vellutino, F. R., Fletcher, J. M., Snowling, M. J., & Scanlon, D. M. (2004).

[173] Stanovich, K. E. (2009).

[174] Stanovich, K. E. (2009).

[175] Spear-Swerling, L. (2019). Structured literacy and typical literacy practices: Understanding differences to create instructional opportunities. *Teaching Exceptional Children*, *51*(3), 201-211.

[176] Spear-Swerling, L. (2019).

[177] Moats, L. C. (2017).

[178] Moats, L. C. (2017).

[179] Petscher, Y., Cabell, S. Q., Catts, H. W., Compton, D. L., Foorman, B. R., Hart, S. A., ... & Wagner, R. K.

(2020). How the science of reading informs 21st-century education. *Reading Research Quarterly*, *55*, S267-S282.

[180] U.S. Department of Education, Institute of Education Sciences, National Center for Education Statistics, National Assessment of Educational Progress (NAEP). (2022).

[181] National Reading Panel (U.S.), National Institute of Child Health, Human Development (U.S.), National Reading Excellence Initiative, National Institute for Literacy (U.S.), United States. Public Health Service, & United States Department of Health. (2000).

[182] U.S. Department of Education, Institute of Education Sciences, National Center for Education Statistics, National Assessment of Educational Progress (NAEP). (2022).

[183] Gersten, R., Baker, S.K., Shanahan, T., Linan-Thompson, S., Collins, P., & Scarcella, R. (2007). *Effective Literacy and English Language Instruction for English Learners in the Elementary Grades: A Practice Guide* (NCEE 2007-4011). Washington, DC: National Center for Education Evaluation and Regional Assistance, Institute of Education Sciences, U.S. Department of Education. Retrieved from http://ies.ed.gov/ncee/wwc/publications/practiceguides.

[184] Gersten, R., Baker, S.K., Shanahan, T., Linan-Thompson, S., Collins, P., & Scarcella, R. (2007).

[185] National Academies of Sciences, Engineering, and Medicine. (2017). *Promoting the educational success of children and youth learning English: Promising futures*. National Academies Press. Retrieved from https://www.nationalacademies.org/our-work/fostering-school-success-for-english-learners-toward-new-directions-in-policy-practice-and-research.

[186] Goldenberg, C. (2020). Reading wars, reading science, and English learners. *Reading Research Quarterly*, *55*, S131-S144; Vaughn, S., Mathes, P., Linan-Thompson, S., Cirino, P., Carlson, C., Pollard-Durodola, S., ... & Francis, D. (2006). Effectiveness of an English intervention for first-grade English language learners at risk for reading problems. *The Elementary School Journal, 107*(2), 153-180.

[187] Goldenberg, C. (2020).

[188] Goldenberg, C. (2020).

[189] Goldenberg, C. (2020).

[190] Johnson, L., & Gatlin-Nash, B. (2020). Evidence-Based Practices in the Assessment and Intervention of Language-Based Reading Difficulties among African American Learners. *Perspectives on Language and Literacy.*

[191] Johnson, L., & Gatlin-Nash, B. (2020).

[192] Gatlin-Nash, B., Johnson, L., & Lee-James, R. (2020). Linguistic differences and learning to read for nonmainstream dialect speakers. *International Dyslexia Association: Perspectives on Language and Literacy*, 28-35.

[193] Gatlin-Nash, B., Johnson, L., & Lee-James, R. (2020).

[194] Washington, J. A., & Seidenberg, M. S. (2021). Teaching reading to African American children: When home and school language differ. *American Educator*, *45*(2), 26; Gatlin-Nash, B., Chow, J. C., & Evans, I. (2022). Addressing the needs of nonmainstream dialect speakers with learning disabilities. *Intervention in School and Clinic*, 10534512221130066.

[195] Johnson, L., & Gatlin-Nash, B. (2020); Gatlin-Nash, B., Johnson, L., & Lee-James, R. (2020).

[196] Gatlin-Nash, B., Johnson, L., & Lee-James, R. (2020).

[197] Johnson, L., & Gatlin-Nash, B. (2020).

[198] Johnson, L., & Gatlin-Nash, B. (2020).

[199] Tortorelli, L. S., Lupo, S. M., & Wheatley, B. C. (2021). Examining teacher preparation for code-related reading instruction: An integrated literature review. *Reading Research Quarterly*, *56*, S317-S337.

[200] Robertson, M. K., Sharp, L. A., Raymond, R., & Piper, R. E. (2020). An exploration of teacher preparation practices with foundational knowledge of literacy. *Northwest Journal of Teacher Education*, *15*(3), 2.

[201] Hindman, A. H., Morrison, F. J., Connor, C. M., & Connor, J. A. (2020). Bringing the science of reading to preservice elementary teachers: Tools that bridge research and practice. *Reading Research Quarterly*, *55*, S197-S206.

[202] Hindman, A. H., Morrison, F. J., Connor, C. M., & Connor, J. A. (2020).

[203] Hudson, A. K., Moore, K. A., Han, B., Wee Koh, P., Binks-Cantrell, E., Joshi, M. R. (2021).

[204] Tortorelli, L. S., Lupo, S. M., & Wheatley, B. C. (2021).

[205] Joshi, R. M., Binks, E., Graham, L., Ocker-Dean, E., Smith, D. L., & Boulware-Gooden, R. (2009).

[206] Joshi, R. M., Binks, E., Graham, L., Ocker-Dean, E., Smith, D. L., & Boulware-Gooden, R. (2009).

[207] Joshi, R. M., Binks, E., Graham, L., Ocker-Dean, E., Smith, D. L., & Boulware-Gooden, R. (2009).