SCIENCE-BASED READING IN VIRGINIA

BUILDING A POLICY FOUNDATION FOR EFFECTIVE INSTRUCTION

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DISCLAIMER

The author conducted this study as part of the program of professional education at the Frank Batten School of Leadership and Public Policy at the University of Virginia. This paper is submitted in partial fulfillment of the course requirements for the Master of Public Policy degree. The judgments and conclusions are solely those of the author, and are not necessarily endorsed by the Batten School, by the University of Virginia, or by any other agency.

GLOSSARY & COMMON ACRONYMS

ABTEL: *Advisory Board on Teacher Education and Licensure*, an advisory body serving the Virginia Board of Education

EIRI: *Early Intervention Reading Initiative*, a Virginia policy by which K-3 students are assessed regularly and provided reading supports, tutoring, or other interventions at state expense.

ELA: English Language Arts

IHE: Institute of Higher Education

LETRS: *Language Essentials for Teachers of Reading and Spelling*, a professional development (teacher training) program that helps teachers develop expertise in reading science-based instruction

PALS: *Phonological Awareness Literacy Screening*, an assessment tool used in Virginia schools to evaluate foundational reading skills in K-3 students.

PD: Professional Development (teacher training or continuing education)

RVE: *Reading for Virginia Educators*, a licensure exam taken by prospective Virginia teachers, which covers reading science topics. This test is developed and distributed by ETS/Pearson.

TPP: Teacher Preparation Program

SOL: *Standards of Learning*, Virginia's annual state assessment program

VBOE: Virginia Board of Education

VDOE: Virginia Department of Education

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PROBLEM STATEMENT

Declining and failing fourth-grade reading scores in Virginia schools in recent years, according to both national and state level data, suggest that science-based reading instruction is not current practice in many places across Virginia. This has important consequences for the success of the Commonwealth's schools, the efficient use of government education funding, and for equity amongst Virginian children in concentrated racial minority groups and from poor socioeconomic backgrounds. However, figuring out how to improve reading instruction to better reflect the science presents the Board of Education with an implementation challenge.

EXECUTIVE SUMMARY

This Applied Policy Project Technical Report looks at ways the Board could implement, encourage, and improve science-based reading instruction across Virginia.

In last year's fourth grade cohort, nearly a third of Virginia's students were below basic reading levels. This creates a host of problems for the Commonwealth. Not only does poor reading cause disruptions in classrooms through an increased need for remediation and increased behavioral challenges with students, it has severe long-term consequences as well. Children who have not learned to read proficiently by third grade are 400% more likely to drop out before high school graduation than their literate peers. They are more likely to get involved in the criminal justice system, they are more likely to become pregnant as teens, their income is predicted to stagnate throughout adulthood, and they are likely to pass on struggles with literacy to their children. All of these consequences can cost the Commonwealth taxpayer dollars through social services and lost revenue.

Luckily, literacy is a solvable problem. By ensuring that teachers understand and use the basic science of reading instruction and its two main elements—sound and meaning—in the general education classroom, all students can flourish as readers and develop the decoding and comprehension skills they need.

Solving this problem is particularly important from an educational equity angle, particularly in the wake of COVID-19's disparate harms for our students. Using disproven instructional theories instead of science-based reading instruction has been found to aggravate achievement gaps for children of color, children from poor backgrounds, children learning in concentrated poverty, and children with reading and other learning disabilities. These same children have been devastated by the pandemic's disruptive impacts.

There are several other jurisdictions already trying to improve science-based reading instruction, who serve as models in this report: Mississippi, Colorado, and Bethlehem, PA. These jurisdictions have tackled reading instruction through solutions that focus on three main policy

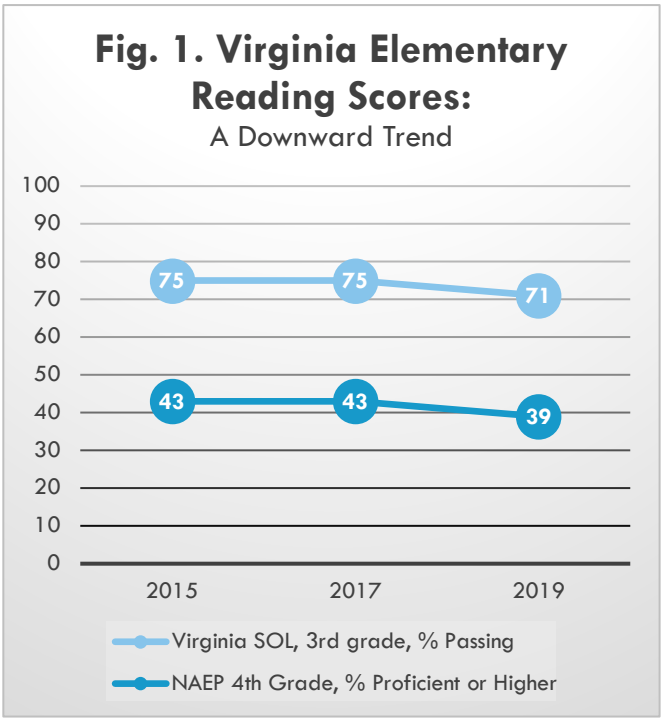
areas: (1) Teacher Preparation Programs, (2) Current Teacher Knowledge (through professional development), and (3) Curricular Choices. Each of these attempts to improve teacher knowledge and classroom instruction in different ways. Thus, as part of this report, I review Virginia's teacher preparation programs (see p. 14), which have space for improvement in both coverage and accountability, and I survey Virginia's district-level curricular choices (pp. 19-20), which likewise demonstrate recent trends of improvement while continuing to make use of a number of disproven and outdated programs. The results of this survey are provided with additional commentary in Appendix A.

In the second part of my report, I propose a set of six alternatives the Board could consider in order to improve reading instruction. I then evaluate those alternatives based on three criteria: their expected effectiveness, likelihood of effective implementation (considering the political landscape and the Board's powers), and their cost to the Commonwealth. Of these criteria, I consider effectiveness to carry the most weight, followed by implementation, then cost.

I ultimately recommend the Board take two first steps. First, the Board should refer to its Advisory Board on Teacher Education and Licensure (ABTEL) a review of the Reading for Virginia Educators' Licensure test (RVE), including determining appropriate coverage of reading science and an effective cutoff score. Second, the Board should work with the Department of Education and the new Governor to develop a legislative proposal that would incentivize adopting comprehensive science-based curricula, and would incentivize dropping outdated and disproven programs that many districts are still using.

CONTEXT OF THE PROBLEM

Learning to read—and learning to read early—is one of the most important educational and social achievements in a child's life (Lyon, 2003). Achieving reading proficiency by third grade is associated with a wide variety of positive long-term outcomes, not just in academic terms, but in health, criminal justice, and socioeconomic stability (Hernandez, 2012; Morgan and Farkas, 2012). Yet Virginia's children appear to be struggling. In the last several years, Virginia's fourth grade reading scores have trended downward, both according to the National Assessment of Educational Progress [NAEP] (NAEP, 2019) and the Virginia Standards of Learning [SOL] assessment (VDOE, 2019) (See Fig. 1). This trend suggests a flaw in Virginia's reading instruction that the Virginia Board of Education seeks to address.



Cognitive science tells us how reading should be taught (National Reading Panel, 2000). Some children—who tend to be wealthy enough to start with a large knowledge base and to speak formal English at home—simply need exposure to an environment conducive to reading (Hanford, 2020). However, the vast majority of children need more explicit instruction as well (Hanford, 2020). Reading, according to the science, is made up of two essential parts (Farrell). The first part is *decoding*: when you look at words on a page, do you know how to say them? If you don't, do you have tools to sound them out using their letters? The second part is *comprehension*: do you know the meaning of the words you're reading? Do you know enough about the subject of the text to follow what is going on? If a word is unfamiliar to you, can you make a pretty good guess about what it means? These are the tools of reading. And for most kids, they need to be explicitly taught.

EQUITY IMPACTS

The students most likely to fall behind on reading are poor children and children of color (Hanford, 2020). Additionally, since students of color and poor students are often concentrated in high-needs schools (Duncombe and Cassidy, 2016), their reading problems may not be identified for special intervention because their struggles don't make them stand out from the pack (Hanford, 2020). Children of color in particular are less likely to be identified for special

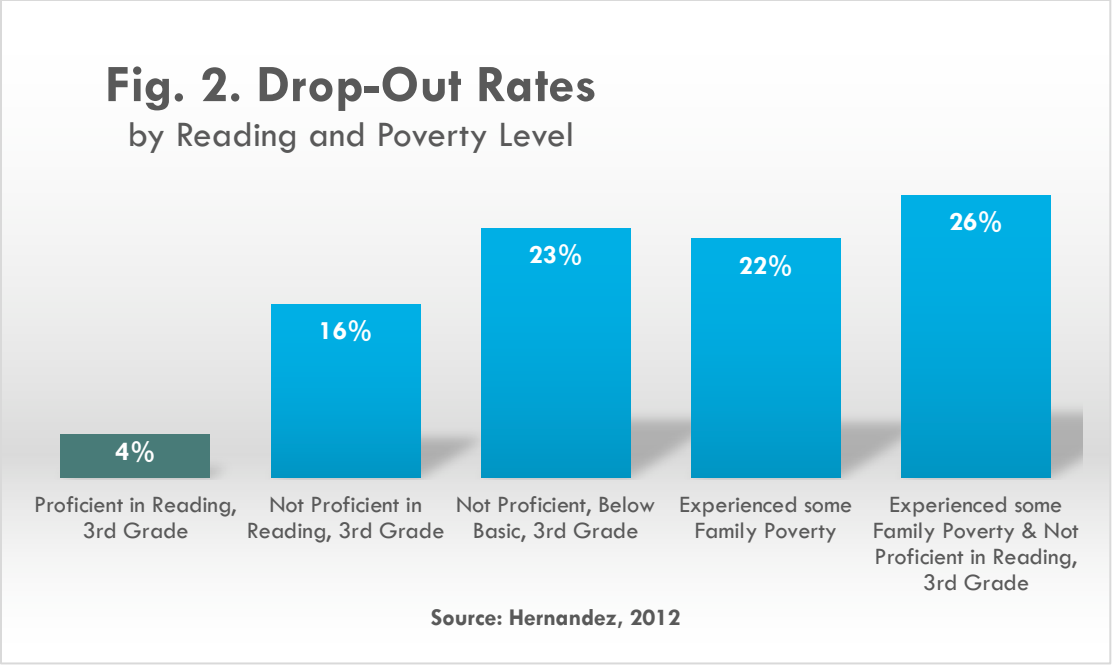
education for their reading problems (Hanford, 2020). This makes science-based reading instruction not only an issue of school quality, but an essential issue of equity for Virginia to solve.

Current reading instruction serves most well-off children just fine. Well-off children typically show up to kindergarten with foundational literacy skills, broad vocabularies, and a wide knowledge base. Additionally, the parents and schools serving privileged children are far more likely to be attentive to reading struggles and to notice a child who might need more explicit instruction and provide extra tutoring (Hanford, 2020). By contrast, students in schools of concentrated poverty or minority, students whose parents lack the resources or knowledge to advocate, and students with dyslexia or other reading disabilities are likely to go unnoticed and are unlikely to have access to direct intervention (Hanford, 2020).

Racial and ethnic graduation gaps **disappear** when students master reading by the end of third grade and are not living in poverty.

Evidence shows this equity problem is stark. While 16 percent of all children who struggle with literacy fail to ultimately graduate high school— four times more than the rate for literate students (see Fig. 2), an incredible 26 percent of children who struggle with literacy *and* experience poverty fail to graduate high school (Hernandez, 2012). The rates are even worse for children of color: 31 percent of poor African-American students and 33 percent of poor Hispanic students who did not hit the third-grade proficiency mark in a recent study failed to graduate (Hernandez, 2012). But remarkably, the same study found that "racial and ethnic graduation gaps disappear when students master reading by the end of third grade and are not living in poverty" (Hernandez, 2012). Simply by removing two factors—poverty and illiteracy, we can address one of the greatest inequities facing our children today.

But it is important to act early. Once the reading gap begins, it only widens over time, due to something called the "Matthew Effect": as some children improve at reading, their vocabulary grows, their decoding skills speed up, and their knowledge base grows from reading (Hanford, 2020). Meanwhile, those who struggle with reading learn fewer words, avoid decoding practice, and miss out on widespread knowledge and content that would make reading easier (Hanford, 2020). Thus, improving early reading instruction—before third grade—may be the key to closing some of Virginia's persistent achievement gaps and preventing larger scale, longer-term consequences.



CONSEQUENCES OF POOR READING INSTRUCTION

So what happens if students aren't taught in ways that align with science? Reading instruction that is not based on science results in lower literacy levels for many students (Hanford, 2020). As mentioned above, the effect on literacy is particularly noticeable for disadvantaged groups, concentrated minorities, and students with reading disabilities (Hanford, 2020). In other words, if reading is not taught explicitly, as science instructs, then disparities quickly appear—and grow—between the reading scores of various student groups (Hanford, 2020). Students from poor backgrounds or in concentrated poverty and children of color in predominantly minority schools experience the worst of these losses (Hernandez, 2012).

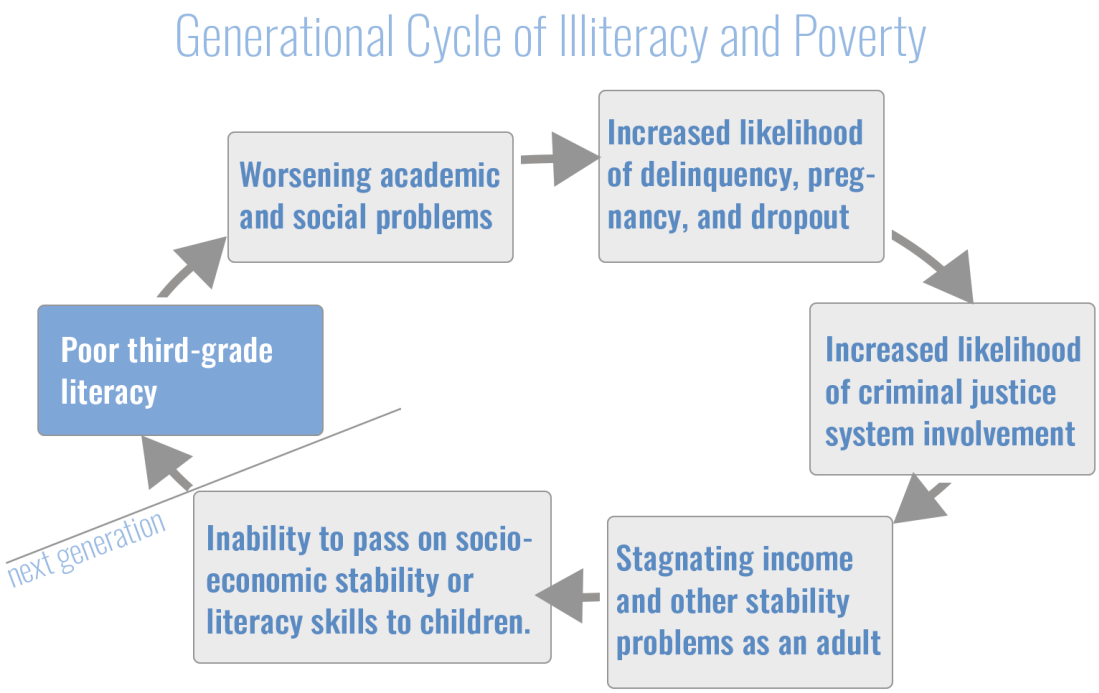
In last year's fourth grade cohort, nearly a third of Virginia's students were below basic reading levels (NCES, 2019). This group is likely to face significant academic, social, and health difficulties in the years to come. When children cannot read well by third grade, they face a difficult academic path. They will struggle to learn every other subject in school and likely never catch up as a reader, due to the above-mentioned Matthew Effect—those who can read well get better through lots of practice, and those who can't fall behind from avoiding reading tasks (Hanford, 2020). Because of their difficulties, they may develop social anxiety and behavioral issues that makes it hard for them to fit in with peers (Morgan, 2012). Ultimately, they are less likely to graduate high school or attend postsecondary education (Hernandez, 2012).

In the meantime, their poor achievement will likely have heavy costs at the school and governmental level, in the form of remediation efforts (which are rarely successful) (CRF, n.d.). Worse, significant community harm can occur if too many students are struggling: teacher turnover and school closure are significantly more common at failing schools (Ryan, 2010),

resulting in the loss of a community institution. Additionally, reading struggles result in accreditation ratings that only seem to encourage worse school segregation (VBOE, 2017).

But the consequences go beyond school evaluations and test scores. Children who cannot read by third grade face myriad troubles in later life. For example, they are more likely to experience unplanned or adolescent pregnancy (WLF, 2012). They are far more likely to become court-involved youth (WLF, 2012), and when older, to spend time in prison (WLF, 2012). They are also likely to struggle to earn a sufficient income their whole lives, since illiteracy correlates with plateauing (rather than growing) earnings (WLF, 2012). Worse, their children are likely to inherit and pass on many of these problems as a consequence of the family's poor education and likely poverty (WLF, 2012). This results in a cycle of harms that can continue for generations, depicted in Figure 3.

Fig. 3. The Cycle of Illiteracy and Poverty.



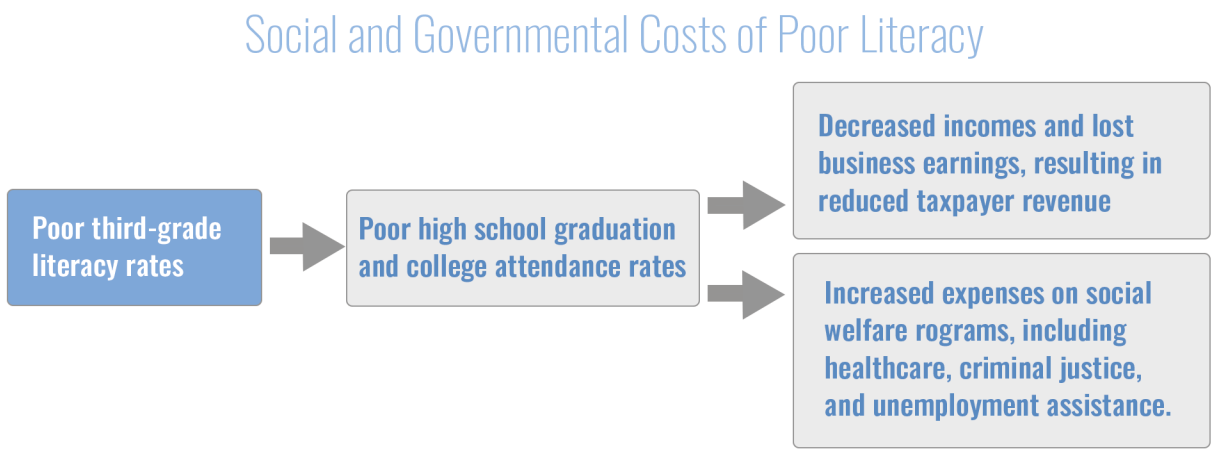
These consequences ultimately have large impacts for society. Even just accounting for tax dollars foregone and spent, Virginia is paying too much, and losing too much, for failing its young readers, as depicted in Figure 2. The World Literacy Foundation estimates that the cost of illiteracy in a developed country can exceed 2 percent of national GDP (WLF, 2012). In the United States, that would be equivalent to over $300 million (WLF, 2012). These costs can include lost income and

Based on this year's numbers, the number of dropouts due to illiteracy would be **over 5,000 students in each graduating class** of Virginia students.

business income (and thereby lost tax dollars), increased welfare expenses and criminal justice expenses, as well as the costs of increased healthcare expenses from less healthy families and unplanned pregnancies (WLF, 2012). But some costs are even more immediate: The Reading Foundation estimates that "[m]ost school districts spend $1,800 to $3,400 per child, per year on students who need remediation." (CRF, n.d.). They point out that this remediation is "very expensive and historically unsuccessful because children who are behind must achieve their normal year of growth plus another year of growth to catch up by even a single level" (CRF, n.d.).

Virginia currently has about 1.265 million public school students, and approximately 31 percent of them (based on the current third grade class's numbers) are insufficiently literate (NCES, 2019). Based on these estimates, Virginia's school districts are spending at least an estimated $700 million dollars on remediation each year. Additionally, 16 percent of children who are not reading proficiently by third grade do not graduate high school (Hernandez, 2012), making them far less likely to be stable earners and taxpayers. Based on this year's numbers, the number of dropouts due to illiteracy would be over 5,000 children in each graduating class of Virginia students. Based on an average income in Virginia of $71,564 (USCB, 2019), losing state taxes (5.65 percent rate) for 5,000 new individuals each year constitutes an additional $22 million in annual state income taxes foregone. Additional costs could be calculated in the form of welfare expenses and criminal justice expenses.

Fig. 4. Fiscal Consequences of Poor Reading Instruction for the Commonwealth of Virginia



ROOTS OF THE PROBLEM & AREAS FOR INTERVENTION

The Virginia Board of Education has followed the work of other states (Hanford, 2019) on this topic, and now they want to find a way to improve reading instruction in Virginia. The primary question is how to do so. This involves determining the scope and origins of current reading instruction practices in Virginia.

One place to start is teacher knowledge. Studies show that a large proportion of teachers nationally have flawed ideas about how to teach reading (EdWeek, 2020); it is possible Virginia's teachers also lack proper information. Similarly, school and division leaders, who often make important choices about curriculum, for example, may be unaware of the science, and therefore less committed to seeing it play out in the classroom. It's also unclear if Virginia's teacher preparation programs are adequately teaching the science of reading (Hanford, 2020). Experts familiar with the programs believe many of the professors in Virginia were never taught the science themselves, so even if the science is listed on their curricula or textbooks, it may not be effectively conveyed to new teachers (McGinty, A., Solaris, E., personal communication, Nov. 5, 2020).

Another consideration is curriculum—both in the general education classroom and reading intervention setting. Though the Board of Education recently approved a new list of curricula for use in early elementary English Language Arts, many districts are still using outdated materials based on flawed research (McGinty, A., Solaris, E. personal communication, Nov. 5, 2020; see also survey results, Appendix A). Intervention programs are even more varied. While the General Assembly provides reading intervention funds for young elementary students who are struggling with reading, divisions and school leaders have wide flexibility in how they use the money, with no particular state requirement on the training of reading interventionists or the curriculum used in such programs (VDOE, EIRI).

In good news, the developers of the Phonological Awareness Literacy Screening test (PALS), Virginia's primary formative reading assessment, have been working on improving the test's ability to detect dyslexia and other reading disabilities (McGinty, A., Solaris, E. personal communication, Nov. 5, 2020). However, their work has stalled due to COVID-19, and may be delayed further without greater General Assembly funding. Of course, if once students are identified for intervention, they still aren't getting effective instruction, there remains another problem to solve. Since prior to this year, state guidelines for reading intervention funds provide almost no requirements for how intervention is conducted, ineffective instruction is another likely root problem (see HB 1865 (2021)).

During my years in Charlottesville, I have had the joy of working as a K-4 reading specialist in one of the local public schools. The work I have done has been both rewarding for me and important for my students. But I have seen firsthand what happens if we arrive too late. Even by fourth grade, struggling readers can develop a fixed identity as poor or avoidant readers. Luckily, we have tools to prevent this from happening. It is my hope this project makes widespread science-based reading instruction, proper identification of reading struggles, and consistent, high-quality reading intervention an essential element of Virginia's public-school system for years to come.

EVIDENCE ON POTENTIAL SOLUTIONS

Policy work in other jurisdictions indicates three main pathways by which other jurisdictions have ensured science-based reading instruction for their students. These include overhauling teacher preparation programs, conducting intensive professional development, or adopting more effective curricula and programming, including improved reading intervention frameworks. In some cases, all three are adopted together. In other cases, one is prioritized first. This section introduces the evidence on such alternatives generally, while later research in this APP will describe the landscape in Virginia specifically and make recommendations.

TEACHER PREPARATION PROGRAMS

When Mississippi decided to revamp its reading instruction, its primary vehicle for doing so was to reexamine its teacher preparation programs (Hanford, 2018). An initial study of those programs showed that they lacked fundamental instruction in the science of reading (BRI, 2015). Mississippi thus began its reform by mandating that teacher preparation programs in Mississippi would include two full courses on the science of reading (Hanford, 2018). However, further study revealed that these courses still weren't all that effective—because the professors didn't understand the content they were teaching (Hanford, 2018). In fact, many of the professors instructing teacher candidates exhibited false beliefs about reading. So, the state offered LETRS (*Language Essentials for Teachers of Reading and Spelling*) training to professors of teacher preparation programs as a way to fill in their knowledge (Hanford, 2018). Though some resisted, many partook in the training. Professors had an incentive to participate, because Mississippi requires a test on fundamentals of reading science in their licensure process—if the professors didn't know the content, their students would not pass (Hanford, 2018).

Plenty of researchers have studied the disconnect between scholarly literature and cognitive science on reading and the content of teacher preparation programs (Rickenbrode and Walsh, 2013; Joshi et al, 2009, Cunningham et al, 2015). Perhaps the most comprehensive and long-term data collection on this point comes from the National Council on Teacher Quality (NCTQ), which has tracked the curricula of teacher preparation programs since 2006 on their coverage of the essentials of reading as understood by the National Reading Panel (Rickenbrode and Walsh, 2013; NCTQ, 2016; NCTQ, 2020). Though the state-level data has yet to be released for 2020 (it may have been delayed due to COVID-19), national results show that teacher preparation programs have significantly improved at meeting a set of basic requirements for reading content (two readings and one lecture on a topic, for example, is one way to meet the bar). However, even with such a low bar and with improvement, many schools are still not adequately addressing the area of phonics instruction and phonemic awareness (NCTQ, 2020). Several Virginia schools showed a lack in at least one of the five fundamental Reading Panel topics as of four years ago (NCTQ, 2016), and Virginia was ranked below the national average in its teacher prep programs' coverage of essential components of reading science (NCTQ: Program

Performance in Early Reading, 2020). Experts have noted that NCTQ is attempting to raise their bar for teacher preparation programs in coming years in order to make the data more useful—but it is difficult to do so without losing legitimacy (McGinty, A., Solaris, E. personal communication, Nov. 5, 2020). Note that this data has limitations, since it only reviews curricular materials and does not include the beliefs of the professors or the actual learning of students. As the anecdote above shows, the professors need to understand what they are teaching for their programs to be effective. Even if NCTQ is seeing improvement in curricular decisions, professor content knowledge (Joshi et al., 2009) and textbook content are both essential elements (Joshi et al., 2009).

Other studies have investigated different angles of the problem. For example, the National Center for Educational Evaluation and Regional Assistance, within the U.S. Department of Education, conducted a sample survey of students in teacher preparation programs across the country, to determine their perceptions of their own teacher preparation programs (Sallinger, et al., 2010). These students were not finished with their programs, so their information may have been imperfect (Sallinger et al., 2010). All in all, the report concluded that teacher preparation programs focused "moderately" on the essentials of reading (Sallinger et al, 2010). And, while the prospective teachers rated their own knowledge and preparedness very highly (up to 95 percent), on average, the pre-service teachers correctly answered only 61 percent of fluency items, 58 percent of meaning items, and 53 percent of phonics/phonemic awareness items (Sallinger et al, 2010). This highlights one of the biggest problems with changing reading instruction once a teacher's career has already started: many teachers simply don't know what they don't know. The writer of one review of reading literature

Teacher Preparation Programs in Virginia

Virginia has 36 Institutes of Higher Education (IHEs) that offer teacher preparation programs. These institutions are generally accredited through a national organization called the Council for the Accreditation of Educator Programs (CAEP), though the Board also offers its own second pathway for accreditation (DTEL, 2007).

Virginia requires new elementary teacher candidates to take one licensure test on the science of reading, called the **Reading for Virginia Educators (RVE) Praxis test.** As of 2019, with the exception of one institution whose RVE passing rate on the was only about 40%, *every* institution met *all* accountability requirements for continued approved status, which includes a cohort pass rate on the RVE of 80% (VDOE, 2019). In fact, the average RVE pass rate for a whole program is an incredible 98.6% (VDOE, 2019). The current cutoff score to pass the test is **157** (out of a possible score range of 100-200) (VDOE, 2018; 240Tutoring, n.d.).

The National Council on Teacher Quality (NCTQ) finds Virginia's RVE to meet its requirements for fully assessing the science of reading (NCTQ, 2021). However, **NCTQ places Virginia just below the national average in its teacher prep program coverage of the reading science (rank 26)**— far below, for example, Mississippi, which fully covers all five elements and has been used as a case example throughout this paper (NCTQ: Program Performance in Early Reading, 2020).

concluded, "Teachers overestimated their levels of knowledge…Teachers were particularly poorly calibrated in the essential domains of phonemic awareness and phonics, with the majority of kindergarten to third-grade teachers failing to recognize the limits of their knowledge of skills known to be critical to quality literacy instruction." (Cunningham & O'Donnell, 2015). Rather shockingly, even special educators seemed to lack this knowledge, even though direct systemic instruction is far more important in the special education reading intervention setting.

All of these studies highlight that it is crucial to step in early and ensure that teacher preparation programs have (1) curriculums that cover the essentials of reading, (2) professors that understand such essentials, and (3) textbooks that accurately and thoroughly explain the content. If teachers start with a strong knowledge basis, they are less likely to push back against changing strategies further into their careers.

PROFESSIONAL DEVELOPMENT

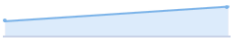
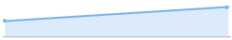
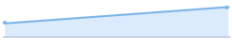
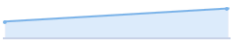
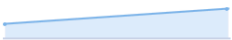
The next most commonly mentioned strategy for altering a jurisdiction's reading instruction was the implementation of professional development (PD), or teacher training programs that help teachers adopt new pedagogical strategies or educational theories. For example, in Bethlehem, Pennsylvania, the entire district purchased a high-quality literacy instruction professional development program (known as LETRS[1]). First, all principals had to attend the training over the course of a year, since district leaders figured getting the school leaders on board would help ensure full implementation down the line (Hanford, 2018).

The next year, the teachers began their training. Within three years, all kindergarten through second grade teachers had taken the in-depth course on reading science through their professional development program (Hanford, 2018). And, as a result, they changed their instruction. The overwhelming improvement in students' reading scores (see Figure 3), while not produced under a controlled study, is widely attributed by the teachers to their changed knowledge and instruction (Hanford, 2018).

Research on the effectiveness of teacher professional development programs shows a wide variance in effectiveness. While there generally aren't comprehensive controlled trials of individual PD programs, such as LETRS, we have a sense of what *types* of professional development can work. The Economic Policy Institute conducted a review which found, for example, that certain types of PD are considered more effective than others, including "attending

[1] LETRS stands for *Language Essentials for Teachers of Reading and Spelling*. This program was developed by Louisa Moats to help teachers master reading science. For more information about LETRS, see: https://www.voyagersopris.com/professional-development/letrs/overview

Figure 3. Improvement in DIBELS scores after LETRS professional development

SCHOOL (low-income%)*	2015		2018
Asa Packer (28%)	47%		95%
Calypso (63%)	35%		100%
Clearview (66%)	51%		100%
Donegan (97%)	30%		69%
Farmersville (28%)	64%		93%
Fountain Hill (90%)	28%		60%
Freemansburg (83%)	51%		93%
Governor Wolf (54%)	36%		76%
Hanover (13%)	70%		100%
James Buchanan (55%)	60%		72%
Lincoln (78%)	32%		83%
Marvine (94%)	40%		72%
Miller Heights (26%)	62%		98%
Spring Garden (41%)	51%		92%
Thomas Jefferson (73%)	75%		92%
William Penn (77%)	42%		81%
DISTRICT (56%)	**47%**		**84%**

SOURCE: Bethlehem Area School District. *Low-income is defined as the percentage of students who qualify for free or reduced-price lunch, 2017-18.

university courses related to teaching; presenting at workshops, conferences, or training sessions; and making observational visits to other schools" (Garcia and Weiss, 2019). LETRS—a year-long course of study taught by teacher educators with Ph.D. (professor-level) certifications—seems to be a good example. These types of PD tend to be more interactive, less passive, and more content specific or applicable to their jobs (Garcia and Weiss, 2019; Darling-Hammond et al., 2017). Ideally, these programs present opportunities for ongoing coaching and follow-up, by virtue of their longer timeline and more intensive nature.

However, the research on outcomes is less certain. One rigorous study of two theoretically high-quality PD programs which took place over the course of a summer and school year demonstrated no significant improvement in teaching or student outcomes against the randomized control group a year later (Quint, 2011). Another study by the New Teacher Project found that despite the studied districts spending an average of $18,000 per year on professional

development for each teacher, teachers' instructional practices were not approving, and the researchers were unable to draw any causal relationships with improvements they did find (TNTP, 2015). Other studies reviewed by the Learning Policy Institute are more optimistic: in one study, teachers engaged in active learning activities in ten sessions over the course of the year and their students resulting reading outcomes far outpaced the control group, and in another, teachers involved in a collaboration- and observation-based PD saw their students' scores increase nearly two times as much as the control group's (Darling-Hammond et al, 2017).

Many teachers dislike the very idea of PD because of their negative experiences. For example, nearly a third of teachers surveyed in the national School and Staffing Survey in 2011-2012 described their PD as "not" or only "somewhat" useful (Garcia and Weiss, 2017). Education Week explains that condescension in programming is one big complaint:

> Professional development doesn't actually treat [teachers] like professionals. Mandatory seminars often have no relevance to their particular subject area or cover skills that they mastered years ago. Facilitators from outside groups introduce new instructional practices and don't inquire about, or even acknowledge, teachers' current strategies. [To teachers, this] "feels like a slap in the face." (Schwartz, 2019)

Meanwhile, district and state level leaders are trying to execute new government priorities and they often rely on PD to do so. Ultimately, some kind of PD training may be a necessary element of any implementation the Board makes, but the Board can attempt to select PD options that best match the available evidence on effectiveness.

NEW CURRICULUM

A final common suggestion from reading advocates is to investigate the curriculum being used in a school setting, particularly in general education K-2 classrooms, although many wider school factors—books in the library, reading intervention programs, and teacher beliefs and knowledge—also matter. However, to make the work of district and school leaders harder, there is actually very little quality research analyzing early reading curriculum effectiveness. In fact, there is virtually no high-quality empirical evidence on curricula. Many companies claim to have evidence of their program's effectiveness, but causal links are difficult to draw without adequate controls. Generally, the only research that is available is analyses and reviews by experts on whether such curricula match the science and contain approved pedagogical techniques and sequencing. Thus, while nearly every reading program claims to be "science-based," many of them lack the elements of good reading instruction or ignore it entirely (Moats, 2007).

The National Council on Education Evaluation put out a practice guide in 2016 that includes a number of specific pedagogical strategies for teachers, including specific lessons in phonemic awareness and even an ordered guide to the sounds that should be taught in systematic phonics instruction (Foorman, et al, 2016). This practice guide is meant to help curriculum

designers during curricular creation. However, its guidelines and examples could also be used to evaluate curricular choices.

The creator of LETRS, Louisa Moats, has done her own analysis, though it is a bit old at this point. She found that "[m]ost large publishers' core, comprehensive reading programs (for example, SRA/McGraw-Hill's *Open Court*, Harcourt's *Trophies*, and Scott Foresman's *Reading Street*) have all five components and good instructional designs. (Moats, 2007). Student Achievement Partners, of the Common Core, also just this year began a four-part series analyzing the four most "common categories of elementary English Language Arts instructional programs" for their fidelity to the "relevant research base." (SAP, 2020). Their first issue, analyzing a balanced literacy program called *Units of Study*, is meant to provide an analysis of so-called "balanced literacy" programs in general (SAP, 2020), but may be less helpful since it focuses on general issues with curricula from grades K-12.

Perhaps the most comprehensive analysis of curricula to date is that produced by Ed Reports, which has reviewed all but one of the K-2 English curricula recently approved by the Virginia Board of Education (Ed Reports, 2020). Ed Reports provides a thorough analysis of the curricular materials based on a number of indicators. While the *overall* score considers a number of factors less relevant to the topic of this paper, several indicators (1O-T) measure programs' commitment to explicit, direct literacy instruction. One of these, for example, is described as follows:

> Materials, questions, and tasks directly teach foundational skills to build reading acquisition by providing systematic and explicit instruction in the alphabetic principle, letter-sound relations, phonemic awareness, phonological awareness (K-1), and phonics (K-2) that demonstrate a transparent and research-based progression with opportunities for application both in and out of context. (Ed Reports, 2020)

On this indicator, the reviewers give each curriculum a score between 1 and 4 (4 being the best) for alignment with these concepts. Additionally, the reviewers provide detailed examples from the lesson plans and routines of how the indicator is met or not, by describing examples of good practices from specific lessons. This helps validate the strength of the analysis. The Ed Reports analyses thus can provide some detail about the science base of different curricula in use across the Commonwealth, and can provide guidance for improving curricular choices.

Additional sources on how school leaders can evaluate their own literacy programs suggest looking not just to the basal curriculum but to the way teachers use this curriculum (e.g., whether they piece together lessons from different sources or stick to the sequence), how

intervention is targeted and provided,[2] and how the whole school subscribes to consistent reading principles (Levesque and Carnahan, 2005). Additionally, expert Moats notes that it is important teachers are trained to properly teach these programs, in order to get the full benefit of a highly reviewed curriculum (Moats, 2007). All such elements constitute parts of a science-based reading curriculum.

FIG 5. A STUDY OF READING CURRICULA IN VIRGINIA

The Virginia Department of Education does not keep a list of which curricula and programs are in use in divisions across the Commonwealth, and whether those programs match the reading science. As part of this Applied Policy Project, therefore, I worked with the Department of Education to survey school divisions to try to answer this question.

METHODOLOGY

The survey was sent to divisions as part of the Superintendent's weekly email. Divisions were given about a month to respond. Divisions were asked to select or list curricula they had adopted, as well as to provide information about when the curriculum was adopted and whether they were considering upcoming curricular changes. In addition to K-5 general curricula, the survey asked about intervention programs. The survey was not mandatory, but the **response rate was about 64%**, representing a wide variety of urban, suburban, and rural divisions.

RESULTS

The results of the survey are presented in the chart that follows. Note that districts could select more than one option, so the percentages will add up to more than 100%. More extensive information about the programs, including ratings and reviews from national organizations, are presented in Appendix A with the entire study results.

CONCLUSIONS

What was immediately clear from the study is that **many divisions have chosen a 'create-your-own' approach to reading instruction**, relying less on validated comprehensive curricula than division-created materials and on using multiple programs at once. This approach may be more flexible, but it is difficult to regulate or evaluate.

Another important finding was that **many divisions are currently rethinking their curricula in light of increasing discussions of the reading science**. For example, one division wrote, "We

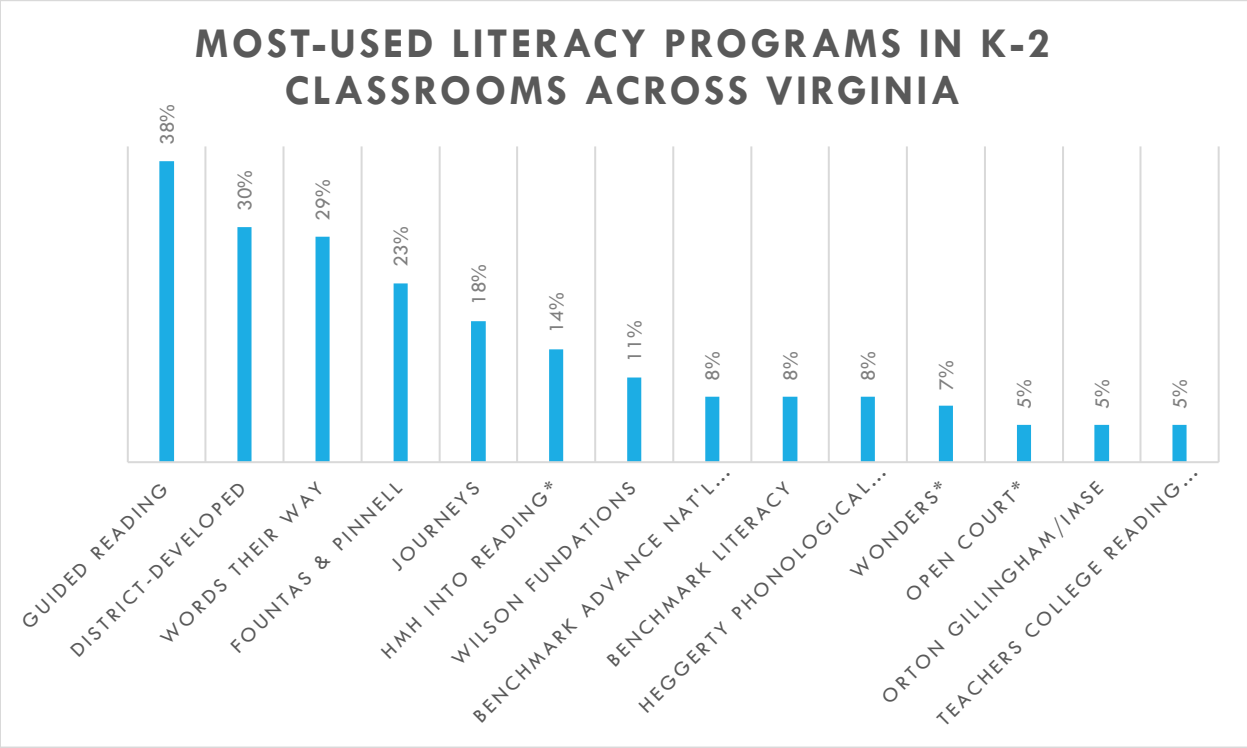
[2] The What Works Clearinghouse keeps records of scientifically-produced studies on various intervention programs' effectiveness, which includes a number of general curriculums and intervention programs (IES, n.d.). However, often only one or two studies of each program meet the required standards, which limits which conclusions that can be drawn. (IES, n.d.)

are currently adding in a stronger phonics focus into our curriculum based on the current reading research," while another wrote, "We are currently looking at the research related to the Science of Reading and will need to make adjustments to our curriculum accordingly." At least four divisions mentioned LETRS professional development specifically.

- "We will likely keep the base curriculum similar, but we are also using information from LETRS training to purposely embed more phonemic awareness into the curriculum…"
- "…About 35% of all of our classroom teachers, sped teachers, and reading teachers have gone through or are currently engaged in the volume 1 LETRS training."
- "They are in LETRS training and we are implementing many strategies such as Sound Walls, and stronger phonemic awareness instruction."

This is encouraging movement, as it indicates that some divisions in Virginia are beginning the work suggested by this paper already, and their leadership may help pave the way for more reform.

Finally, the results of the survey, when one counts up how many divisions are making use of which programs, suggest that **there is room for improvement in Virginia's curricular choices**. Many divisions continue to use curricula that are strongly discredited or criticized by the research presented by this paper. For more information about these criticisms, see Appendix A.



CRITERIA

Five alternatives are presented to improve reading instruction in Virginia. The alternatives are based on models from other jurisdictions, combined with research on Virginia's current status. Each is evaluated on three primary criteria: fiscal impact, likelihood of implementation, and-- weighted most heavily-- effectiveness, which includes general improvement in reading skills as well as improvement in equity. These criteria are described below.

ESTIMATED FISCAL IMPACT

To put it simply, investing in improved reading instruction costs money from the state budget, and the Commonwealth has limited resources. This is a challenge of many Board initiatives (such as last year's Standards of Learning change, which included new allotments for an "Equity Fund."), as the Board depends on legislators to advocate for these budget changes. Additionally, using funds for one of these alternatives may deplete funds available for other important educational purposes. This criterion, therefore, will rate alternatives by their cost, with less expensive alternatives preferable to more expensive ones. While it is difficult to estimate cost in some cases where price will depend on vendor quotes, we can extrapolate from costs for similar programs or costs for the same programs in other jurisdictions, particularly by considering how many individuals would be going through the proposed programs.

Measurement: Dollars (hundreds of thousands)

LIKELIHOOD OF SUCCESSFUL IMPLEMENTATION

While the Board has complete control over certain education regulations, including state K-12 accreditation, teacher preparation program accreditation standards, and various other delegated administrative powers, in other situations, the Board must seek funding from legislators or must collaborate with the Department of Education to implement a policy change. This criterion evaluates the likelihood of effective implementation of the program or policy change, based on a variety of factors:

- Possibility of ineffective implementation (For example, does the improvement depend on a vendor's capacity? Does the change leave open the possibility that local actors will ignore new requirements?)
- Predicted political resistance and pushback
- Predicted timeline for political success and time commitment for implementation.

One potential challenge with making political predictions and measuring implementation success is the potential turnover in Board members and DOE personnel with a new administration after this November's gubernatorial election, as well as the potential variety in vendor quality, as

vendors will likely be used to accomplish different elements of reading intervention programs. It is harder to predict outcomes with unknown actors.

Measurement: This criterion is evaluated on a four-step scale of "likelihood": Unlikely, moderately likely, likely, highly likely.

EXPECTED EFFECTIVENESS

Perhaps most importantly, the goal of any alternative is to improve reading instruction in a way that actually impacts student learning, something that should be evidenced by changes in test scores, including NAEP scores, PALS scores, and Virginia third-grade SOL scores. While the goal is to improve reading instruction across the Board, targeting these improvements to students currently at the 'bottom' of the 'gap,' perhaps by investing state dollars or piloting a program toward certain divisions or schools, could be most effective. Thus, effectiveness includes not only improvements to reading scores generally, but impacts on equity between student groups.

While the ideal way to evaluate each alternative on this criterion would be to use quantitative data showing a proven effect on reading scores, for some alternatives the proven effect is more indirect, and we can only evaluate 'quality' based on principles known to improve reading scores or other quantitative outcomes. This prevents drawing conclusions of causal certainty. To exhibit transparency in predictions, each analysis of predicted effectiveness will also describe the quality of data supporting the prediction.

Measurement: This criterion will be rated on a four-step scale of effectiveness: Unknown effectiveness, moderate effectiveness, moderate-high effectiveness, high effectiveness.

ALTERNATIVES

The following pages present three main categories of alternatives suggested by the research above. Each is a policy proposal aiming to improve either teacher preparation programs, current-teacher knowledge, or the curricula in use across Virginia. For some alternatives, multiple implementation options are presented. Each alternative is then analyzed based on the criteria presented above. After all analyses, a summary is provided in the form of an "Outcomes Matrix," followed by a recommended course of action for the Board.

ALTERNATIVE 1. TEACHER PREPARATION PROGRAM CHANGES

(A) MODIFY FACTORS INCLUDED IN TEACHER PREPARATION PROGRAM ACCREDITATION STATUS TO INCLUDE THE ACTUAL READING SCORE GROWTH OF STUDENTS TAUGHT BY GRADUATES OF THE PROGRAM

Current teacher preparation program accountability in Virginia includes several measures intended to get at the quality of preparation for science-based reading instruction, including the passing scores on the Praxis Reading for Virginia Educators (RVE) licensure test, as well as reviews of graduates by the school leaders who have hired them (VDOE, 2017; VBOE, 2019; VDOE, 2018). However, actual data on reading improvement in the graduate teachers' classrooms is not included. This means that if a teacher does not know the reading science, and s/he is evaluated by a school leader who does not know the reading science, the teacher preparation program will continue to get high marks for ineffective instruction. By tying accreditation to students' actual assessment data, (even if aggregated by classroom and de-identified to preserve children's privacy) teacher preparation program leaders and professors would be incentivized to ensure their graduates are actually effective reading instructors. This gives professors a stronger incentive to teach science-based reading instruction and new teachers a strong incentive to learn it. However, this alternative would present some complicated implementation and measurement decisions; for example, how much improvement in student reading scores is sufficient?

Evaluation of Alternative 1A	
Estimated Fiscal Impact	**Cost of state collection and transfer of PALS data (estimated $110,000).** From a data scientist's perspective, tracking not only graduates, but then tying student scores to graduates, and transferring that data to be submitted in accreditation, is a potentially big ask. Assuming the PALS test could include a basic data output summary for a teacher, which the teacher's principal could include with any other employment reviews being submitted to the preparation program, this cost would likely include hiring a programming staffer[3] in the PALS office.
Likelihood of Successful Implementation	**Unlikely.** Using student assessment data to evaluate teachers is not done in Virginia. Using it to evaluate teacher preparation programs is likely to garner even more pushback. In addition, many teacher preparation programs in Virginia receive their accreditation through the national body CAEP, rather than using state-based factors set by the Board. It would be difficult to adjust CAEP's criteria, since it is a national body working in many states. Finally, no jurisdiction has tried an initiative like this, giving little incentive for trying it here, where leaders tend to prefer to follow well-researched policy initiatives, rather than to blaze their own trail.
Predicted Effectiveness at Improving Reading Instruction & Equity	**Unknown effectiveness.** Because so many factors can impact students' reading scores and reading growth, there are a number of potential pitfalls and equity issues with this proposal. Attributing reading scores and growth to individual teachers-- and then attributing this effectiveness to their teacher preparation programs-- could incentivize gaming or exacerbate inequities by discouraging teachers from teaching in high-needs classrooms where students are more likely to struggle with reading.

[3] The estimate for this position is based on the fiscal impact statements of two distantly related bills in the General Assembly, one of which requires certain teacher preparation program employment data to be aggregated and reported by VDOE (SB1433, 2019), and the other of which requires VDOE to annually collect and publish district level data that it has not collected or published before (HB1985, 2019). One of these required hiring a new staff person at $55,000/yr, another was predicted to be absorbed at no cost into VDOE's current workload. Because the proposed change in Alternative 2A is more complicated than either of those bills, I am assuming hiring costs for the needed position will be significantly higher, to attract someone with the requisite programming and data systems skills, or to pay for more than a single position.

(B) WORK WITH ETS TO MAKE THE PRAXIS READING FOR VIRGINIA EDUCATORS (RVE) TEST MORE RIGOROUS AND SCIENCE-BASED

The current pass-rates for the RVE hover around nearly 99% for educator preparation programs in Virginia (VBOE, 2019). This may mean the cut score for passing is too low, or it may mean—given that student reading scores across the state are in decline—that the test is simply not covering the content in a deep, meaningful, and challenging way. The Board, or the Department's representatives, should work with ETS and researchers to review test items on the current VRE, analyze the validity of cutoff scores used, and identify ways to make the test a more meaningful form of accountability for teacher preparation programs. One way to implement this alternative is to refer an update to the Advisory Board on Teacher Education and Licensure (ABTEL), who helped develop cut-off scores and adopt the RVE ten years ago.[4]

Evaluation of Alternative 1B	
Estimated Fiscal Impact	**No additional cost (possible vendor-dependent cost).** Revising the RVE may require time from ETS employees outside of the current contract, while merely changing the cut-off score would have no fiscal impact. At least initially, however, this proposal would be low-cost. Even an extensive review and revision with a few researchers and ETS employees is unlikely to generate high costs, and the Board and ABTEL both serve at no cost.
Likelihood of Successful Implementation	**Highly likely.** The Board's authority over teacher preparation program accreditation and licensure means that the Board could unilaterally pursue this process, and ABTEL is well-positioned to begin a review in a timely fashion. The only potential pitfall is if ABTEL representatives do not have enough of a background in science-based reading to effectively evaluate the RVE and recommend changes. In order to ensure effectiveness, the Board could review the background of members of ABTEL and include a reference (or funding) to consult with experts on the topic in their review. Note that this change is unlikely to see any political resistance or pushback, as it is so technical. It may, however, take a year or more to complete the review. Further changes to the test could take even longer.

[4] See the adoption of the RVE here https://www.doe.virginia.gov/boe/meetings/2011/05_may/minutes.pdf; Additional information about ABTEL is available at https://www.doe.virginia.gov/boe/committees_advisory/teacher_ed_licensure/index.shtml and https://www.doe.virginia.gov/boe/committees_advisory/teacher_ed_licensure/code_of_virginia.pdf.

Predicted Effectiveness at Improving Reading Instruction & Equity	**Moderate effectiveness.** Other states have used this method to incentivize improvements to their teacher preparation programs with positive results, including Mississippi, indicating that this is an effective way to improve reading instruction in a state. However, note that the National Council on Teacher Quality has not found Virginia's RVE to lack essential coverage at this time. Thus, for this change to effectively work as an incentive, Virginia would need to be willing to aggressively pursue a higher cutoff score or a test that is even stronger than other states.

(C) HAVE THE STATE HOST BIANNUAL CONFERENCES FOR PROFESSORS OF ELEMENTARY CANDIDATES, INVOLVING HIGH QUALITY PROFESSIONAL DEVELOPMENT ON THE SCIENCE OF READING.

Many of the professors of teacher preparation programs in Virginia were taught using outdated reading science or were taught to pass on outdated pedagogical tools. The state could host regular conferences for these professors that would bring them up to date on reading science, provide materials for further study, and provide lesson plan ideas for their own teacher preparation courses that they teach. This proposal is similar to the Mississippi policy of providing voluntary professional development to teacher preparation program professors, many of whom participated.

Evaluation of Alternative 1C	
Estimated Fiscal Impact	**Cost of Conference[5] (estimated to be $30,000 or less).** A regular conference helps the state convey the importance of science-based reading and provide practical help to professors in sharing the science with those who are teaching future teachers, while adding to a sense of community and shared dialogue about the topic.

[5] To estimate the cost of this conference, I assume expected attendance of about 3 professors from each Institute of Higher Education with teacher preparation programs, creating a conference size of about 100 individuals. While the conference held by VDOE this year was online, and extremely low cost, I provide a high estimate, which includes catered breakfast/lunch costs of $60/person and materials costs of $40/person. Though VDOE may be able to find a space for free as well as willing trainers and panelists, I assume a cost of $10,000 for a full day event and a cost for speakers of about $10,000 (https://www.socialtables.com/blog/event-planning/conference-cost-estimator/).

Likelihood of Successful Implementation	**Likely.** During COVID this year, VDOE hosted a virtual conference on science-based reading for division instructors that was well-attended and well-reviewed. It is likely that professors would be similarly amenable to a group event. There is unlikely to be political pushback, though there may be organizational costs and administrative challenges in planning. Additionally, a conference can likely be put together on a shorter and more certain timeline. Note that there is some room here for ineffective implementation, if the training provided by the conference is of poor quality.
Predicted Effectiveness at Improving Reading Instruction & Equity	**Moderate effectiveness.** Teacher knowledge is a function of the knowledge professors have to pass on to teacher candidates during their teacher preparation programs. Improving that professor knowledge, in order to improve teacher preparation programs, is a natural first step. However, because this is voluntary, and it only indirectly affects teacher candidates, there may be a delay in outcomes. On the other hand, Mississippi's model of LETRS training for professors suggests some success. Today, Mississippi's teacher prep programs are ranked at the top of the nation (NCTQ: Programs, 2020), and their students' skyrocketing reading scores are evidence of this improvement (Hanford, 2019).

ALTERNATIVE 2. CURRENT-TEACHER & SCHOOL LEADER PROFESSIONAL DEVELOPMENT

Several of the jurisdictions that have successfully tackled declining reading scores through improving science-based reading instruction did so through offering the LETRS (or a similar) science-based reading professional development program to school leaders and K-3 teachers. In order to encourage this, the Commonwealth could pilot a state-offered program in certain low-performing, high-needs districts, while tracking reading score changes in those districts to see if there is a change resulting from the training. This piloting method could reduce the fiscal impact estimate while also focusing on equity. In coming years, the legislature could allocate additional funds to expand the programming statewide, or if the Department can absorb the cost, arrange to do so.

Evaluation of Alternative 2	
Estimated Fiscal Impact	**Cost of trainings (estimated $700,000-$2 million for statewide rollout[6]).** If the state invests in a largescale professional development campaign, there may be a more significant price tag attached than some of the other alternatives. First, the state would need to have local facilitators trained by a high-quality national program. Then, these facilitators would need to conduct extensive professional development in their home districts. In some cases, this may involve providing stipends to teachers for extra training hours, or investing in materials facilitators can offer to teachers attending their trainings.
Likelihood of Successful Implementation	**Moderately Likely.** This program is likely to see little resistance from teachers or divisions, given the movement indicated by the study conducted for this project-- many divisions are trying to do this on their own, and state funding to help them would be appreciated. Additionally, this alternative is likely to have strong support from several advocacy groups including Dyslexia advocates and reading specialists. If, however, there is a need for legislative allocation of funds, if DOE cannot absorb these costs, this may take a longer timeline and face more political challenges. Finally, note that there is again a possibility of ineffective implementation if a poor vendor is chosen for training district professional development facilitators, or if those facilitators do a poor job at the local level.

[6] Virginia has about 130 separate school divisions. On average, I estimate that each division would need about two facilitators trained (though this would vary by division size), who will then conduct PD sessions in their home divisions at schools. The cost per person of LETRS training, used here as an example, is $1800/per person (https://www.voyagersopris.com/professional-development/letrs/training-support) , so these trainings would total around $468,000. This calculation assumes district employees can fold conducting PD sessions into their regular job responsibilities and does not require hiring new positions, which may be a stretch. Additional costs are based on the number of teachers. Assuming about a quarter of teachers in Virginia -or 22,500 teachers- (https://ballotpedia.org/Public_education_in_Virginia) teach reading content in grades K-3, remaining costs could include materials costs ($10-150) or even stipends for these teachers to attend extra PD sessions. Thus, the high estimate includes an extra $60 per teacher for one or both of these expenses.

Predicted Effectiveness at Improving Reading Instruction & Equity	**Moderately-highly effective.** While evidence on the effectiveness of PD programs overall is mixed, other jurisdictions that have invested in LETRS training for principals and teachers have seen strong results, even if those results have not been studied in a quasi-experimental setting. Note, however, that this option will take a few years to completely implement, since this involves training facilitators who then train teachers and school leaders. LETRS is an extensive program that can take a year or more to complete. It could be several years until enough teachers are trained to start seeing student results.

ALTERNATIVE 3. CURRICULAR CHANGES

The Constitution of Virginia gives the Board of Education the power to approve textbooks. This power, however, does not create a mandate on divisions, which may choose to use the Board's recommendations or their own. As clear from the survey results presented in this paper, division-level curricular choices remain an important area for improvement. Any change in this area would likely require either a legislative change, legislative budget proposal, or a regulatory change in which the Department of Education changes their review process for division-level choices such as curriculum.

(A) MANDATE THAT DISTRICTS CHOOSE FROM AN APPROVED CURRICULUM LIST

Though it may be politically unpopular in a state with such strong local district control over schools, more stringent requirements for curricula, including a mandated list from which divisions must choose, as well as mandatory training requirements for the implementation of the new program, may be an appropriate strategy.

Evaluation of Alternative 3A	
Estimated Fiscal Impact	**No additional expense.** Changing state law to require divisions to conform to Board-approved choices in any future adoptions should have no significant fiscal impact. However, legislative drafters will want to consider how to ensure compliance. Additionally, drafters would need to consider rules on division-created materials, supplemental programs, and other common techniques and approaches currently in use.

Likelihood of Successful Implementation	**Unlikely.** This change would almost certainly require legislation, beyond the Board's actual jurisdiction. It also faces other obstacles. Virginia has a strong culture of local control over schools, and any legislative proposal seeking to limit that control is likely to see strong pushback from important stakeholder groups like the Virginia School Board Association and Virginia Association of Superintendents. It is also possible that even with a mandate, compliance and accountability will be a problem. Divisions may resist the mandate by refusing to adopt new curricula at all. However, there are many states that could serve as a model for a stronger curricular enforcement program (CAP, 2015).
Predicted Effectiveness at Improving Reading Instruction & Equity	**Highly effective.** The study results presented in this report (see pp. 19-20, and Appendix A) show that using outdated and non-scientific curriculum remains a pervasive problem in Virginia school divisions. Additionally, research shows that training teachers with science-based systematic reading curricula and equipping them with proper teaching resources leads to stronger reading skills in students. Thus, changing curricula could make a big difference-- and a mandate is likely to work. This mandate is very similar to a law passed in Colorado in 2019, the Colorado READ Act, which, with some pushback, has led to curricular changes across the state (CDE, 2020; Schimke, 2019).

(B) USE STATE FUNDS TO INCENTIVIZE NEW CURRICULAR ADOPTION

Alternatively, the state could agree to pay directly for curricular materials and training purchases for a certain list of curricula, to incentivize better choices (including, perhaps, some kind of negotiated discount with vendor providers). Since state-level funding is a sought-after resource in divisions, this incentive could be very effective at changing behavior.

Evaluation of Alternative 3B	
Estimated Fiscal Impact	**Significant expense.** There are several options by which the Commonwealth could use its budget as an incentive for divisions to choose optimal reading curricula. First, the legislature could allocate funds to directly purchase curricular materials-- textbooks, teacher manuals, and training programs. Alternatively, the legislature could create a grant program to which divisions can apply for funds (and possibly technical assistance) to help them review their current adopted materials and select new ones. Either of these options could cost anywhere from $10-$40 per student (CAP, 2015). With a student population of 1.265 million, this will

	be costly, though some of the cost depends on potential savings on current funds being allocated to poorer curricular choices. For a more rigorous study of the costs and benefits of state textbook adoptions, see *The Hidden Value of Curriculum Reform*, Center for American Progress (2015).
Likelihood of Successful Implementation	**Moderately Likely.** The incentive option would be significantly more amenable to local divisions and other stakeholder groups. However, this alternative would face challenges from the appropriations and finance committees for its budgetary costs. As it is, Virginia's state funding of schools ranks near the bottom of the country (in the bottom ten, in terms of proportion of funds coming from state funds rather than local dollars (NEA, 2019). Additionally, this option leaves open the possibility that resistant divisions will refuse to change.
Predicted Effectiveness at Improving Reading Instruction & Equity	**Moderately effective.** Like alternative 3A, it is clear that curricular change could have a big impact. However, it is less clear whether an incentive would effectively address the gaps in current policy. The study results show that many divisions are already moving in this direction on their own. Others seem stuck in their old curricular ways. It is possible that an incentive program would reward divisions whose behavior was changing anyhow, leaving other divisions without change. On the other hand, an incentive is likely to have a big impact on behavior in low-resourced divisions, meaning that equitable outcomes are a natural result of this policy--Virginia's most resource-starved divisions will get more resources and will see improvements in their reading instruction that help their students close achievement gaps with better resourced divisions.

OUTCOMES MATRIX

The following graphic summarizes the analyses above in one place. To help with interpretation, boxes are colored in based on their score, with darker being a better outcome for each category.

	Criteria 1: Fiscal Impact	Criteria 2: Likelihood of Successful Implementation	Criteria 3: Expected Effectiveness
Alternative 1A: **Use of student data in teacher prep accreditation**	Estimated $110,000	Unlikely	Unknown Effectiveness
Alternative 1B: **Revise the RVE or raise cutoff scores**	No additional cost (or Vendor-dependent)	Highly likely	Moderate Effectiveness
Alternative 1C: **Conference for Teacher Prep Professors**	Estimated $30,000	Likely	Moderate Effectiveness
Alternative 2: **Professional Development for Current Teachers**	Estimated $700,000-$2 million	Moderately Likely	Moderate-High Effectiveness
Alternative 3A: **Curricular Mandate**	No additional expense	Unlikely	High Effectiveness
Alternative 3B: **Curricular Incentive**	$10-42 million	Moderately Likely	Moderate Effectiveness

RECOMMENDATION

The analysis above demonstrates the tradeoffs faced by the Board. When choosing a course of action, being assured of successful implementation often directly conflicts with the expected effectiveness of the alternative. While it's easy to strike Alternative 1A as both costly and of unknown effectiveness, the remaining alternatives do not present an obvious best solution.

In recommending the Board's course of action, I weight expected effectiveness the most heavily, followed by likelihood of successful implementation. While cost can present a barrier, none of these programs present a forbidding amount, and the Board can work with the Department of Education and General Assembly to find ways to implement alternatives within budget. Additionally, I consider those areas of intervention most closely aligned to the Board's current responsibilities and powers, finding that Alternatives 1C and 2 both seem better fits for a Department, rather than Board, initiative.

Ultimately, I recommend the Board's course of action be two-fold: (1) **Refer a revision to the RVE to ABTEL (Alternative 1B)**, a no-cost certain step that could yield improvements in teacher preparation programs if ABTEL finds changing test items or the cutoff score to be warranted, and (2) **Begin discussions with legislators about improving curricular choices through a new incentive program (Alternative 3B).** The Board has, since the late 1800s, been the primary body responsible for choosing and approving textbooks in the Commonwealth. The increasing importance of choosing a science-based reading curriculum, and the results of the study conducted for this report showing how many divisions are still using outdated materials, highlight how important it is that curricular choices are not neglected by state-level authorities.

This year, the General Assembly decided to require for the first time that all EIRI intervention be conducted by trained teachers or tutors, based on Department-approved reading science (HB 1865, 2021). A natural next step would be for the General Assembly to give the Board or Department the power to better enforce or incentivize the use of scientifically-backed curricula at the local level. Even if the General Assembly does not pass such a change, it's possible that the threat of greater state control could force some divisions to rethink their current practices.

While this alternative requires the Board to work with the General Assembly, and cannot be accomplished unilaterally by Board representatives, the Board is well-positioned to advocate for change, given its work investigating reading curricula, the recent adoption of new approved choices, and the results of the study conducted for this APP. Just as the Board has used its political position to advocate for improved standards of learning, education funding, and equity in schools, the Board can become a strong advocate for science-based early reading instruction by pursuing both its own regulatory actions regarding the RVE and legislative change involving curriculum.

CONCLUDING THOUGHTS: IMPLEMENTATION GUIDANCE

Because implementing alternative 3B is more complicated (whereas the other selected alternative, 1B, simply requires a Board reference to its own advisory body), the following implementation plan focuses on how best to successfully craft and pass legislation that will effectively change curricular choices in Virginia.

SUGGESTED IMPLEMENTATION PLAN FOR ALTERNATIVE 3B

1. *Once COVID concerns have passed and schools are reopened (early fall 2021)*, find an optimal op-ed writer or journalist to publicize the results of this study about reading curricula in Virginia. The article should recommend that the General Assembly step in with stronger state regulation. Some ways to make the issue more tangible and human is to potentially interview frustrated parents from various backgrounds to highlight the equity issue as well as general educational concerns. Emily Hanford, a national journalist, may be a good candidate to write this piece.[7] Particularly if published on a national scale, Virginia's leaders are more likely to respond (as they did after the New York Times exposé on Charlottesville schools' racial disparities, for example[8]).

2. Meet with governor's office this fall to discuss governor's budgetary package and priorities for the next Session, and whether incentives for new curricular adoption and training might be included as part of his/her legislative package.

3. Depending on governor's support, set up meetings with 'friendly' legislators to discuss the problem and seek legislative sponsorship. These legislators would likely include previous sponsors of Board initiatives or reading changes. For example, Karrie Delaney (D), Lashrecse Aird (D), Carrie Coyner (R), and Richard Black (R) may be good places to start.

4. Over winter, once legislation is proposed and the possibility of state intervention is clear, meet with local stakeholder group representatives (listed below) to discuss potential solutions and legislative language, and to try to gain support.

5. See the legislation through during the 2022 session. In drafting, consider:

- Who will approve curricula? The Department? The Board? An independent body of researchers and teachers? How often?

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[7] Hanford's work inspired the Board to pursue this project in the first place. See Hanford, E., What the Words Say: Many children struggle with Reading, and children of color are far less likely to get the help they need, APM Reports (Aug. 6, 2020), https://www.apmreports.org/episode/2020/08/06/what-the-words-say

[8] Green, E., Waldman, A. You are still Black: Charlottesville's Racial Divide Hinders Students, New York Tlmes (Oct. 16, 2018), https://www.nytimes.com/2018/10/16/us/charlottesville-riots-black-students-schools.html; Charlottesville City Schools, Response to the New York Times/ProPublica Article, http://charlottesvilleschools.org/nyt

- How will general education curriculum requirements be combined with new EIRI intervention initiatives?
- How will district behavior change happen? A ban on bad curricula, an incentive to choose good curricula, a mandate to choose from a state-approved list? Will there be an accountability process that checks that divisions have updated their curricula? By when? Will this accountability include looking into classrooms to ensure the curriculum is implemented properly and faithfully? Will districts be provided free curricula if they choose the state approved option? Will the state help with teacher training?
- Will the state track which districts have adopted science-based curricula and how those districts' reading scores have fared?
- What will be provided to districts who already have been using appropriate curricula?

6. If compromise legislation is needed, potential options could include:

- A study bill, to collect information on other states who have worked on this topic recently, to make official legislative recommendations in 2023
- A requirement that the Department of Education keep a list of adopted curricula in every division in a central and public location, to create better accountability and transparency on this issue.

7. If the legislation does not pass during the 2022 session, work with the Department of Education to continue prioritizing awareness on this topic, which may include other alternatives presented in this paper, including working with professors and providing professional development opportunities to teachers and school leaders.

STAKEHOLDER RESPONSES

The Board needs to consider four main stakeholder groups:

1) Representatives of Local-level School Actors, including superintendents, district staff, school leaders and teachers, and school boards. These will likely be represented by the Virginia Association of School Superintendents (VASS)[9], Virginia School Boards Association (VSBA)[10], Virginia Association of Elementary School Principals (VAESP)[11], and the Virginia Education Association (VEA).[12] Because this alternative proposes changing the behavior of these actors, and potentially limiting their local authority, this group is going to be incredibly important. Their support would likely see the bill through.

2) The General Assembly. Getting legislators to understand this issue, to see it as politically valuable (hence the importance of media coverage in step 1), and to be a valuable use of state funding, in the case of an incentive program, would mean the success of the legislation and a

[9] https://www.vassonline.org
[10] https://www.vsba.org
[11] https://www.vaesp.net/home.html
[12] https://www.veanea.org

change in Virginia's curricula. Legislators are most likely to be concerned if the local stakeholder groups mentioned above oppose the legislation, or if the fiscal impact of the proposed legislation is too high to be appropriated.

3) The Department of Education. The Board's legislative success and the ultimate implementation of this plan—including approving curricula, publishing a centralized list of curricula in use across the state, and holding divisions accountable for their choices—would likely fall on the Department. Thus, it is important to seek the Department's impressions of feasibility and preferred legislative language, and if possible, to secure true support from Department employees who work on this issue long-term.

4) The Incoming Governor's Administration. Finally, if the new governor's administration sees reading science as an education priority, this would go a long way toward seeing the bill through. With gubernatorial support, funding for the bill would be in the proposed budget, and legislative supporters would be much easier to find. This bill is a natural candidate for bipartisan support, so the only downfall of it becoming a governor's bill is if the opposing party decides to oppose it on party lines. This is more likely, again, if the local stakeholder groups above decide to push back; Virginia's legislative culture results in bipartisan support for governor's bills all the time.

Risks and Potential Pitfalls

The biggest risk with legislating a centralization of curricular choices is the potential politicization of education, and the downfalls of removing full local authority-- what if the state gets it wrong, and a locality could do better? To prevent this happening, it is essential that the body charged with approving and evaluating reading curricula incudes scholarly experts as well as teachers. One way to avoid the risk of politicization is to ensure the legislative language specifies a full delegation of the responsibility to this body, and that the legislation specifies the membership of the body in a specific way.[13]

Potential Success

Following this process to adopt legislation that will improve curricular choices across the Commonwealth and draw attention to the importance of science-based reading instruction has the potential to make a huge change for our children. Virginia could see stark improvements in equity, learning, and life trajectories for the next generation. In the post-COVID era, as we focus

[13] For example, following protests of racially biased policing in 2020, the state changed the membership makeup of the Criminal Justice Services Board Committee on Police Training to include representatives of social services organizations, minority groups, and mental health professionals. See HB5108 (2020 Special Session I), https://lis.virginia.gov/cgi-bin/legp604.exe?202+sum+HB5108

on remedying the inequities wrought by this crisis, we have the opportunity to change learning in our schools and classrooms to make education far more effective for every child. By pursuing science-based reading, Virginia could become a leader in education, reading, and equity in a way that will have an impact for generations to come.

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APPENDIX A. RESULTS OF CURRICULAR SURVEY

The following table presents the top used K-2 literacy programs in Virginia school divisions based on a survey conducted in February 2021. For each program, I present the ratings the curriculum has received from Ed Reports,[14] a description of the program's philosophy in its own words, and commentary from major journalism, studies, or reading science blogs that provide insight into the program's strengths or weaknesses. **I do not independently evaluate any curricula**. Occasionally, programs have been reviewed more comprehensively, such as Student Achievement Partners' review of the Teachers' College Units of Study, and the Colorado Department of Education's reviews of several comprehensive curricula under their new reading science law, the Colorado READ Act. Where possible, I have included these reviews in the commentary.

Survey Results: The Top Programs, Approaches, and Curricula Used by Virginia School Divisions

Program Name	Philosophy of Program	Commentary or Criticism
1. Guided Reading Used by 38% of surveyed divisions Not Rated	"During guided reading, students in a small-group setting individually read a text that you have selected at their instructional reading level. You provide teaching across the lesson to support students in building the in-the-head networks of strategic actions for processing increasingly challenging texts." (Fountas & Pinnell, n.d.)	"Although the term "whole language" is rarely used today, programs based on its premises, such as Reading Recovery, Four Blocks, *Guided Reading*, and especially "balanced literacy," are as popular as ever. These approaches may pay lip service to reading science, but they fail to incorporate the content and instructional methods proven to work best with students learning to read." (Moats, 2007)
2. District-Developed Curriculum Used by 30% of divisions	n/a	When divisions develop their own materials, it is difficult to evaluate their effectiveness or faithfulness to reading science. The prevalence of this practice in Virginia is cause for concern.
3. Words Their Way Used by 29% of surveyed divisions Not Rated	Believing that a "hands-on, word sorting approach to word study is invaluable to teachers and students alike," this series provides "resources needed to teach phonological awareness, alphabet knowledge, initial letter sounds, concepts about print, and concept of word in text." (Pearson, 2019)	"Words Their Way is a guidebook for studying words; it is not a spelling curriculum. …To complement the curricula, WTW focuses on a single learning strategy for spelling—word sorting—and it employs hypothesis testing, social interaction, and games." (Gentry, 2015).

[14] **EdReports Foundational Skills Rating** is averaged from the rating for K-2 programs, for items 1O-T (systematic instruction of alphabetics, phonics, and other foundational reading skills), out of a combined score of 22 possible points. Additionally, EdReports has rated a few "supplemental programs" under a different scoring rubric.

4. Fountas & Pinnell Used by 23% of Surveyed Divisions EdReports "Supplemental Program" rating: 31/60	"Fountas and Pinnell's goal is to support the child's development of self-initiating actions he will be able to apply to a range of texts of similar difficulty. With daily teaching, the teacher helps the child climb the ladder of text difficulty with success. The goal of guided reading is to bring the child to the level of complex texts appropriate for the grade, in doing so, teaching must begin with where the child is able to engage with some success, so that there is a point of contact, thereby engaging the child's development of a self-extending system for processing texts." (Fountas & Pinnell, 2021)	"Fountas and Pinnell … created a reading assessment system that uses what are called "leveled books." Children start with predictable books like "In the Garden" and move up levels as they're able to "read" the words. But many of the words in those books — butterfly, caterpillar — are words that beginning readers haven't been taught to decode yet. One purpose of the books is to teach children that when they get to a word they don't know, they can use context to figure it out. When put into practice in the classroom, these approaches can cause problems for children when they are learning to read." (Hanford, 2019; see also Schwartz, 2019) "The F&P leveling system rests on a disproven theory of reading known as "three-cueing," which uses pictures and other context to encourage comprehension." (Leveling Charges, n.d.)
5. Journeys **(Comprehensive Curriculum)** Used by 18% of surveyed divisions EdReports Foundational Skills Rating: 17/22	"Journeys develops students' skills in each of these areas, providing students with the building blocks for success. In Journeys, effectively sequenced, systematic, coordinated instruction develops students' foundational reading skills—in comprehension, phonological awareness and phonics, fluency, and vocabulary." (Houghton Mifflin, 2017)	"Seidenberg, who has reviewed the Journeys materials … said that the amount of materials, lessons, and instructional choices in the program was overwhelming. "It looks like the publisher's response to all the debate about reading instruction was to make sure that they included everything," he said.[…] For example—even though the program offers decodable books, kids were practicing in leveled texts, which didn't offer opportunities to use patterns they learned, Chaucer said. Journeys includes six teacher manuals for its 1st grade program alone, Seidenberg said. "There is so much information in those teacher manuals, it raises serious questions about whether anyone is actually using them," he said." (Schwartz, 2019).
6. Into Reading **(Comprehensive Curriculum)** Used by 14% of surveyed divisions	"Children are born with a love of learning. When we give them high-quality books that intrigue and challenge, we empower them to pursue their natural curiosity and discover their interests…HMH Into Reading™ is differentiated by design to offer a balanced approach to literacy instruction[.]" (Houghton Mifflin, n.d.)	"Programming materials include controlled, decodable texts. However… [t]he leveled text students could be placed into include words with phonics patterns which are more advanced than the skills previously taught. Guided reading coaching cards explicitly direct teachers to encourage word recognition strategies such as "look at the picture for clues to read the word" and "point to the first sound of the word (rather than the whole word) to

EdReports Foundational Skills Rating: 22/22		help solve the word." (CDE, 2020; see also Schwartz, 2019) *Colorado approved this program with caution that teachers should avoid cueing strategies and ensure texts are decodable.
7. Wilson Fundations Used by 11% of surveyed divisions EdReports "Supplemental Program" Rating 35/60	"As a recognized leader in multisensory, structured language programs, Wilson brings more than a decade of systematic and explicit instruction to the K-3 classroom," emphasizing "Phonemic awareness, Phonics word study, High frequency word study, Reading fluency, Vocabulary, Comprehension strategies, Handwriting, [and] Spelling.... Although Fundations includes comprehension strategies, it must be combined with a core/literature-based language arts program for an integrated and comprehensive approach to reading and spelling." (Wilson, 2021)	"Fundations…only provided limited opportunities for phonological awareness. Still, there was a clear scope and sequence for phonics instruction and lots of opportunities for students to decode and encode words." (Schwartz, Nov. 2019) "The educators who participated in this case study unanimously verified that the phonics-based reading program had a sustainable impact on student reading ability." (DeBrito, 2020).
8. Benchmark Advance **(Comprehensive Curriculum)** Used by 8% of surveyed divisions EdReports Foundational Skills Rating: 22/22	The "Foundation" of Benchmark Advance is "Explicit and Systematic Phonics Instruction; Purposeful scope & sequence and spiral review with repetition cycle; Frequent application to real reading and writing experiences; Built-in differentiation for efficient use of instructional time; [and] Print and digital phonics tools." (Benchmark, n.d.)	"Some teachers say it's beyond time for Benchmark to go. Troy Hubbell, a former elementary special education teacher at Denver's Kunsmiller Creative Arts Academy, said many of his students came to him years behind in reading not because they had severe learning disabilities, but because Benchmark Advance didn't properly cover reading basics like phonics and phonological awareness — the ability to hear and manipulate sounds in spoken language." (Schimke, 2020)
9. Benchmark Literacy **(Comprehensive Curriculum)** Used by 8% of Sureveyed Divisions Not Rated	Self-described as a "Balanced Literacy" program that "builds foundational skills such as phonics, word study, and fluency," and "guides students to use text evidence and close reading." (Benchmark Literacy, n.d.)	N/A
10. Heggerty Phonemic Awareness Used by 8% of Surveyed Divisions	"Phonemic awareness is a foundational skill in learning to read and is often a missing piece in early literacy instruction. [This curriculum provides] 35 weeks of daily and systematic instruction in	N/A

Not Rated[15]	phonological and phonemic awareness." (Heggerty, 2020)	
11. Wonders **(Comprehensive Curriculum)** Used by 7% of surveyed divisions EdReports rating: 22/22	"Wonders offers a thorough grounding in foundational skills, from children's first steps in phonemic awareness and print concepts, through sophisticated academic vocabulary and advanced morphological analysis. All along the way, integrated Tier 2 lessons fill any gaps quickly. As they enhance understanding, students are encouraged to listen before speaking, speak before writing, and think critically all along—asking questions, finding text evidence, and building a more advanced set of literacy tools." (McGrawHill, n.d.)	"Program materials include controlled, decodable texts with phonics patterns that have been previously taught. It also has clear structured phonic lessons that are built upon over time and include weekly assessments which includes phonics and PA." However, reviewers cautioned that "Although there are leveled readers as a part of the program, determining the appropriate use should not be reliant on running records or any assessment based on the three-cueing system," which the program does allow. (CDE, 2020)
12. Open Court **(Comprehensive Curriculum)** Used by 5% of surveyed divisions Not Rated	"Open Court Reading is research-based comprehensive K–5 reading, writing, and language arts curriculum that aligns with what we know about how students learn to read. Using systematic, explicit instruction, Open Court Reading helps all students master the foundational skills needed not only to move to proficiency, but also to achieve greater goals of reading independently with confidence[.]" (McGrawHill, 2021)	This program met all expectations under the new reading science law in Colorado, but no reviewer comments were provided. (CDE, 2020)
13. Orton Gillingham/ IMSE Used by 5% of surveyed divisions Not Rated	"The Orton-Gillingham Approach is a direct, explicit, multisensory, structured, sequential, diagnostic, and prescriptive way to teach literacy when reading, writing, and spelling does not come easily to individuals, such as those with dyslexia. It is most properly understood and practiced as an approach, not a method, program, or system." (Orton Academy, 2018).	"The International Dyslexia Association (formerly the Orton Society and, later, the Orton Dyslexia Society) admits that there is little in the way of peer-reviewed, published research to confirm the effectiveness of Orton-Gillingham as an approach, as do other practitioners of the approach." (NOW, 2021)

[15] However, the What Works Clearinghouse suggests positive results for like programs: https://ies.ed.gov/ncee/wwc/EvidenceSnapshot/374

14. Teachers College Reading Workshop/ Units of Study Used by 5% of surveyed divisions Not Rated	This self-described "Workshop Curriculum for Kindergarten–Grade 5" is said to help teachers "provide their students with instruction, opportunities for practice, and concrete doable goals to help them meet and exceed any set of high standards." (Heinemann, 2021)	"The literacy expert reviewers … agreed that the Units of Study program is organized above all on the value of loving to read and the encouragement of reading and writing as lifelong habits, both laudable and vital ambitions." However, reviewers "noted major failings: 1) There is not enough time given to acquiring the phonics skills, which is particularly dire for students who might not immediately master those patterns or read fluently; [and] 2) the program frequently recommends use of SMV (structure/meaning/visual system—known more widely as the three- cueing system)—which is in direct opposition to an enormous body of settled research[.]" (SAP, 2020; see also Schwartz, 2019)

APPENDIX B. ONGOING EFFORTS TO IMPROVE READING INTERVENTION

The following options were initially considered as alternatives, but since efforts are ongoing in both areas and there has been significant progress recently, these are presented only as additional background information for the reader.

A key part of any reading education program is how to help students who need even more than the general classroom level of instruction, estimated to be approximately 10-20% of children in any given class. How do we help children with reading disabilities, children who need even more explicit phonemic guidance, or children who simply require a bit more support? How do we identify those children, and what do we give them? These action items build on work already being done by Dyslexia advocates and the current PALS assessment team, who are developing new assessment items to improve PALS, and who are working on making Virginia's early reading intervention responses more effective.

(a) LETRS OR OTHER SYSTEMATIC LITERACY PROGRAM TRAINING AND MATERIALS FOR EIRI INTERVENTION PERSONNEL. Virginia's EIRI program is a great framework for reading intervention that identifies students in need of additional support and provides state funding for those supports. However, the framework currently provides too much flexibility to divisions and schools and very little accountability for the quality of intervention services students receive. Developing a more evidence-based and accountable program may result in more effective intervention. During the development of this project, HB 1865 passed through the General Assembly. HB 1865 is a bill that mandates new training and resources for the early reading intervention provided with EIRI funds. Assuming the governor signs this bill, it can be used to give VDOE more leverage to require science-based reading intervention across the state. The bill should help move Virginia in the direction suggested by this project. Note, however, that the bill does not have any kind of enforcement clause, which has proved problematic with PALS efforts in the past, so the Board should continue to monitor the bill's effect.

(b) MORE TARGETED PALS ASSESSMENTS AND SCORING FOR IDENTIFYING STUDENTS WHO NEED ADDITIONAL SERVICES. This alternative is already in progress: the PALS assessment office has been developing an improved version of PALS which, among other changes, will accurately identify students with dyslexia. However, the General Assembly has been slow to fund the rollout of this change, leaving current schools with a less effective reading assessment for K-2. Estimated remaining costs to complete the rollout hover around $300,000 - 500,000 a year for two more years (OSESS, 2019). The Board is encouraged to voice support for continued funding of PALS revisions.