For Better Reading, Let's Go To MARS

by Tom Neumark

Executive Summary

Forget the moon. Let's go to Mars. When it comes to cutting the number of fourth graders reading "below basic" in half, we've arguably already had our moon shot. Project Follow Through, the largest education experiment in human history, spent about $1 billion from 1967-1995 to improve reading and other subjects for disadvantaged students.[1] Few educators today even know this history: DISTAR, now known as Direct Instruction, showed the most promise, along with other approaches that emphasized teacher-led instruction.

Unfortunately, the successful approaches were mostly ignored since they went against teachers' prevailing instructional beliefs. Since then, decades of converging evidence from the National Institutes of Health, reading scientists, and cognitive psychology show we can teach nearly every child to read through scientifically-based reading instruction. Reading is the most studied aspect of human learning, but persuading teachers and administrators to use what we know works is difficult.[2] The cornerstone of any successful solution is addressing this reality.

Project MARS (Multistate Analysis of Reading Systems) aims to reduce America's "below basic" rate in reading from 32% on the National Assessment of Educational Progress (NAEP) to 16% or less.[3] *Moonshot for Kids* asks for "bold, new" ideas based on evidence. Most new ideas, however, haven't been around long enough to accumulate evidence of effectiveness, and education history has shown many well-intentioned ideas to be ineffective in practice.[4] If there's innovation in this proposal, it's in the way (described later) it aims to accelerate the adoption of effective instructional techniques and materials by aligning the incentives of participants. This is not a basic research proposal. It's a practical proposal that invites potential backers to invest in known findings that can be scaled up to help large numbers of struggling children.

In terms of effectiveness and feasibility, the National Reading Panel reviewed over 100,000 studies and concluded that scientifically-based reading instruction was the most effective method.[5] Modern research continues to support these conclusions, contributing evidence such as students' saccadic eye movements as they read,[6] functional MRI scans that show the brain's physical structures involved in reading success and failure[7], and successful classroom and district-wide implementations[8] demonstrating that it's possible to improve the early reading skills (which predict reading proficiency) for 16% or more of students.[9]

In terms of scalability, Project MARS patterns itself in some respects after Project Follow Through, but with more stringent requirements for staff, curricula, and research design. Like Project Follow Through, this proposal begins with a limited number of schools and scales up over time. In summary, Project MARS takes known solutions and tries to make them better and easier to implement so that more teachers and administrators will understand and embrace scientifically-based reading instruction and help more students read well.

Proposal

Introduction To The Problem

Reading is the most fundamental skill in education, and success or failure in this area affects achievement in others.[10] Students who are poor readers in third grade are four times more likely to be high school dropouts.[11] Approximately 40% of students struggle to learn to read and half of those will likely fail to read if they do not receive scientifically-based reading instruction.[12]

Our nation's fourth grade scores on the National Assessment of Educational Progress (NAEP) have failed to improve significantly since 1992,[13] with 32% of students scoring "below basic" in 2017. Significant achievement gaps persist. The gap between Caucasian and African-American students has narrowed slowly since 1992, but a significant 26-point difference remains.[14] Hispanic students score 23 points lower than Caucasians, and have not made statistically significant improvement since 1992. Asian American students outperform all other groups.

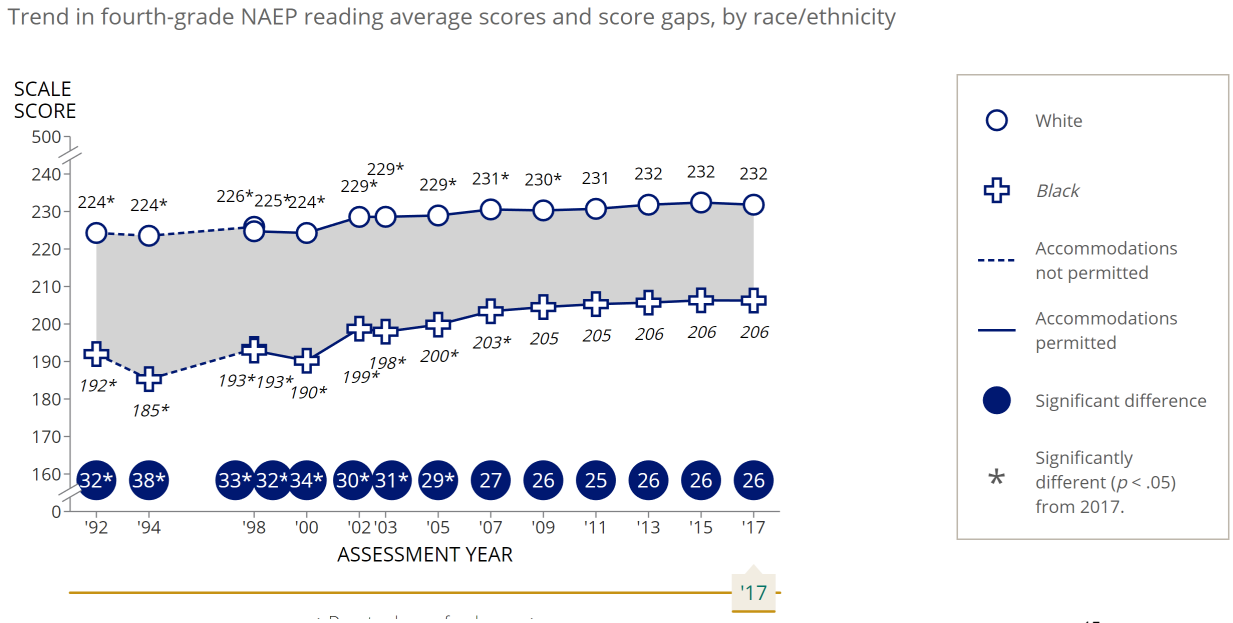

Figure 1. NAEP score trends in Caucasian/African-American achievement gap[15]

International comparisons from the Programme for International Student Assessment (PISA) show that Americans have the lowest reading proficiency of all English-speaking countries. Contrary to a popular belief that poverty explains such poor performance, the major difference between America and other countries is that we have a higher proportion of socioeconomically *advantaged* children. Low socioeconomic status is a stronger predictor of educational outcomes in America than in many comparison countries. Put plainly, other countries do a better job of increasing student achievement overall and closing achievement gaps at the same time.[16]

Previous Attempts To Solve The Problem

For over a century, American educators have been debating the best way to teach reading. Most of the debate has been driven by philosophical beliefs instead of evidence.[17] One side believes that learning to read is naturally acquired like oral language as students attempt to make meaning from print (often called "whole language," "balanced literacy," or "cueing systems"), and the other side believes in the importance of systematically teaching how language works (often

called “traditional,” “phonics”, or “structured literacy”). Both at times have either ignored or oversimplified the science of reading, even engaging in personal attacks.

Space limitations permit only a rough summarization into three eras.[18] The first era was the rejection of what we now call phonics, starting in 1883 when Horace Mann, who started the first public school, argued against the Websterian alphabet/spelling method and in favor of whole word methods.[19] John Dewey also successfully advocated for whole word methods, which were widely spread to the rest of the country despite substantial resistance. By the 1920’s, phonics instruction was still prevalent in schools, but “leaders in the field of reading began to attack the extensive phonics practice that still existed.”[20] The *Dick and Jane* series of books was created, and whole word basal readers became the standard of the second quarter of the twentieth century.

In the second era, roughly from 1930-1977, the other side fought back. Leonard Bloomfield and Clarence Barnhart developed a promising phonics-like approach, but by this time the “whole word” and “look say” methods were so prevalent that they couldn’t get support to expand their methods beyond a single school in Chicago. In 1955, Rudolph Flesch wrote *Why Johnny Can’t Read*, and even accused those against phonics of being communists. From 1961-1967 Dr. Jeanne Chall of Harvard was commissioned to resolve the debate. She published *Learning To Read: The Great Debate*, concluding that evidence supported phonics. In 1977, the first evaluation of Project Follow Through found the more traditional models had better results. Most educators ignored these findings.

The present era started in the mid-1970’s when modern science began providing more reliable insights into reading. As this was happening the “reading wars” heated up. Irene Fountas and Gay Su Pinnell promoted whole language programs, which became popular. Dr. Bill Honig, State Superintendent of Public Instruction for California from 1983-1993, embraced whole language, later admitting he was wrong.[21] At a conference in 1990, Marilyn Adams cited research supporting phonics and phonemic awareness. The next speaker, a whole language advocate, said, “Someone get a silver bullet and shoot this woman. She’s a vampire.”[22]

In the late 1990’s, studies from the National Institute of Child Health and Human Development (NICHD), the National Research Council, and others indicated that students with reading difficulties benefit from explicit phonics instruction.[23] In 2000, the National Reading Panel reviewed over 100,000 studies and recommended systematic and explicit instruction in the five components of scientifically-based reading instruction—phonemic awareness, phonics, vocabulary, fluency and comprehension.[24] At this point the scientific evidence was overwhelming, but most educators still preferred less effective methods. In 2018, the American Public Media issued multiple reports pointing out that most educators don’t understand scientifically-based reading instruction.[25] Reading expert Dr. Mark Seidenberg summarized this history by saying, “The reading wars are over and science lost.”[26]

The Proposed Idea

Project MARS takes the view that reliable scientific evidence will win in the long term--as it has done historically--and aims to equip all educators with the knowledge and tools needed to help students read well. The project proposes a randomized controlled trial to evaluate and improve curricula and training to achieve better reading outcomes. The long-term aspiration of this effort is to transform education from its current status as a belief-based profession to an evidence-based one, which will pay dividends in all subject areas.

The research hypothesis of Project MARS is that educators who commit to learning and implementing scientifically-based reading instruction and are given reliable tools and training[27] will make the largest gains in student reading scores for students overall, minority students, lower income students, and students in the bottom third of reading performance. The study will, at a minimum, consider the following questions.

1. Which curricula are associated with higher student outcomes? How do results vary across student demographics? Do specific curricula appear to improve performance in one or more of the five areas of scientifically-based reading instruction?
2. Does training in scientifically-based reading instruction improve educators' knowledge? Can the training be made more efficient and effective?
3. Is student performance higher for teachers who have greater knowledge of scientifically-based reading instruction?

Feasibility

About 70-80% of students respond to scientifically-based regular classroom instruction (known as Tier I), while 15-20% require targeted, small-group instruction (Tier II), and 5-10% require intensive Tier III support.[28] Attaining full reading proficiency for 75% of students in Tier I and another 9% of the students in Tier II-III is challenging but achievable. Accomplishing the Moonshot competition's goal of 84% of students reading better than "below basic" is possible even if all students didn't reach full proficiency and simply made enough gains to enter the "basic" category.

Incentives

For Project MARS to make scientifically-based reading instruction attractive to all stakeholders, incentives will be offered as described below.

Stakeholder	Incentives
Teachers & Principals	• Annual stipend, which increases upon achieving certification in scientifically-based reading[29] • Paid training in scientifically-based reading instruction **and** the specific curricula used • Greater sense of professionalism due to advanced training
Boards of Education & Central Administrators	• No cost to local districts • Implementation and oversight support provided by Project MARS • Successful implementations will improve district reading results
Curriculum Developers	• Improve curricula and training at no cost • May participate anonymously and can opt to have their program's name revealed

	after learning their results, which encourages participation
Education Professors	• Education professors who achieve certification in scientifically-based reading instruction will receive a stipend for assisting local districts implement Project MARS if selected and approved by Project MARS and the local district to do so
State & Local Policymakers	• Research helps policymakers evaluate curricula • For statewide curriculum approval, policymakers could prefer curricula that participated in MARS, incentivizing curriculum developer participation
Parents	• Parents may request that their district participate. Project MARS will publish the number of parents requesting per school district, which encourages district participation.
Students	• Research has shown that disadvantaged students respond as well or better to scientifically-based approaches than more advantaged students.[30] • Nearly all students benefit from scientifically-based reading instruction, including those already reading adequately but not as well as they could.

Equity: Making The Unfair Race Fair

School psychologist David Kilpatrick described learning to read as an "unfair race" in which only some runners have hurdles put in their way, and "continue to get farther behind as the race progresses".[31] Many of these hurdles are due to brain differences such as phonological and orthographic processing that can be cleared from the track through better instruction.

Other hurdles are more difficult for schools to influence. Differences in language exposure and parent engagement with their infant child "is often a better predictor of that child's developing language proficiency than is family [socioeconomic status]."[32] The variation in parent interactions is a general phenomenon across all income levels. Bilingual children and speakers of minority dialects of English tend to perform less well in vocabulary and reading as compared to monolingual students.

The "simple view of reading" based on research is expressed as an equation[33]:

Reading Ability = Decoding Ability x Language Comprehension

Difficulties in decoding ability are easier to address than those in language comprehension differences due to socioeconomics.[34] Still, the achievement gap can be narrowed even if the participating curriculum developers don't improve language comprehension results. Improvements in decoding instruction help improve comprehension, and students with low socioeconomic status respond as well or better to scientifically-based reading instruction than more advantaged students.[35] In other words, just clearing the hurdles we already know how to clear will help close the achievement gap.

Implementation: Improving Through Feedback and Evaluation

The implementation of Project MARS is designed to mitigate the financial risks to sponsors by providing an initial one year due diligence period, opportunities for course corrections or even ending the project, and phasing in spending over time. Prior to starting, sponsors will be encouraged to undergo 1-3 weeks of training to understand the research underlying scientifically-based instruction. If afterwards sponsors elect to proceed, they enter a planning phase for a year

in which curriculum publishers and other participants are invited to participate. Project MARS attempts to improve upon the approach used in Project Follow Through, which is outlined below.

Category	Project Follow Through	This Proposal (Project MARS)
Purpose	Started as a social program but became an education experiment with disputed goals.	A randomized controlled study to improve curricula and training to achieve better outcomes in K-4 reading.
Subject(s)	Multiple subjects in grades K-3	Reading in grades K-4
Research Design	Non-random design required multiple statistical analyses to correct	Randomized controlled trial
Evaluation Criteria	Not defined before implementation	Defined before implementation
Curricula Selection	Allowed models lacking a strong research base	Limited to models based on scientifically-based reading instruction
Staff Selection	No formal screening process for participation	All staff are screened for commitment to learning scientifically-based instruction
Staff Training	Staff training was specific to the curriculum being used.	All staff receive the same training in scientifically-based reading instruction in addition to curriculum-specific training
Non-Academic Support	Provided as a part of the program	Not provided to avoid a potential confounding variable

Each participating site will be evaluated using scientifically-based assessments that allow for electronic data collection. Results will be monitored, including site visits, and all participants may submit feedback and questions through a website that maintains centralized records and facilitates getting issues addressed by the appropriate party.

The estimated timeline to reach full implementation is 5-7 years per site, based on the experience of schools that have pursued scientifically-based instruction.[36] This leaves room in the schedule to add more sites within the Moonshot competition's ten year window for full scale implementation and to allow for course corrections along the way.

Imperfect Execution Still Promotes Good Outcomes

While the primary goal is to cut the "below basic" rate in half, achieving the secondary goals of increasing educators' knowledge of scientifically-based reading instruction and providing teachers with easy-to-implement, reliable curriculum materials would still have a positive impact. After undergoing training, many teachers and administrators realize that they had gaps in their knowledge and wish they had been provided with this information much earlier in their careers. Some describe their experience as transformational and inspiring.[37] It is exactly this kind of transformation that will propel American education forward.

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[11] Seidenberg, Mark, *Language At The Speed of Sight*, *(Basic Books, 2017)*, pp. 3
[12] Moats, Louisa, *Whole Language High Jinks,* https://files.eric.ed.gov/fulltext/ED498005.pdf
[13] Seidenberg, Mark, *Language At The Speed of Sight*, *(Basic Books, 2017),* pp. 217-246
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[15] Ibid.
[16] Seidenberg, Mark, *Language At The Speed of Sight*, *(Basic Books, 2017),* pp. 231-233
[17] Moats, Louisa, *From Speech to Print, (Paul H. Brooks Publishing, 2010), pp. 6-7* and Willingham, Daniel, *When Can You Trust the Experts?, (Jossey-Bass, 2012), pp. 31-79*
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[27] Training must meet the International Dyslexia Association's Knowledge and Practice Standards
[28] Montgomery et al, *A Principal's Primer for Raising Reading Achievement*, *(Cambium, 2013*), pp. 21-22
[29] Recommended certifications are provided by the Center for Effective Reading Instruction https://effectivereading.org/ceri-initial-certifications/, and are aligned to the International Dyslexia Association's Knowledge and Practice Standards
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