EVIDENCE ADVOCACY CENTER

Envisioning an Ethical and Effective US Education System

Doug Carnine and Reid Lyon

Abstract

The article “Envisioning an Ethical and Effective US Education System” explores the critical need for incorporating evidence-based and research-based practices throughout the United States’ education system to ensure equitable and effective education for all students. Highlighting the case of Wesley Elementary School, where black and poor students excelled due to quality leadership and teaching, the article illustrates the significant disparities in educational outcomes and the challenges in sustaining success across different educational contexts.

The authors, Doug Carnine and Reid Lyon, argue that the education system lacks an evidence-based unified language, common standards, and a commitment to reliable measurement tools to evaluate and enhance educator preparation and student outcomes. They emphasize the necessity of using evidence to inform educational decisions across all the components of the education system, drawing parallels with evidence-based practices in medicine.

Central to the article is the proposed Evidence Advocacy Center (EAC), designed to establish a repository of validated evidence for various educational policies and practices. The EAC’s nine teams,

one for each of the key components of the education system, are curating research-based resources in order to make evidence the foundation for education reform. Four teams represent the decision makers and advocates that significantly impact the quality of education for America's students: institutions of higher education educator preparation, state departments of education and policy makers, district and school leaders, and parent and family advocate groups. Five of the teams represent key components that provide research-based resources to support decision makers: assessment, linguistic diversity, special education, professional development, and instructional materials.

The article outlines the benefits of an evidence-based approach, including improved student outcomes, enhanced teacher effectiveness, informed policy decisions, and increased accountability. However, it also acknowledges the challenges in implementing such a system, including the need for comprehensive professional development, adequate resources, and overcoming resistance to change. The authors advocate a systemic transformation of the education profession, comparable to the shifts seen in medicine and other fields, emphasizing the importance of evidence-based licensure, accreditation, educator preparation, and continuous professional development. They propose using detailed implementation tools including guides and checklists, as well as key performance indicators (KPIs) to guide and monitor the use of evidence-based and research-based practices across nine components of the education system.

Ultimately, the article calls for a coordinated, thoughtful, and caring initiative led by authoritative advocates, both inside and outside education, to disrupt deeply held ideologies and belief systems. By embracing evidence, the authors envision a future where empowered educators provide educational equity and excellence for all students, regardless of their background.

Introduction

In the early 1990s, ten fifth-grade students were on a field trip at their local medical center to reinforce concepts learned from a unit on health and the human body. Their teacher, a well-trained

educator, wanted the students to experience explicit linkages between knowledge acquired in school and how it is actually applied where people work.

During the tour hospital staff were astonished at the depth, quality, and sophistication of the questions posed by these students. “What do you do if someone has a heart attack?” “Do you keep the operating room cold to get rid of germs?”

To be sure, the nurses and doctors interacting with the students were surprised that they not only knew about human anatomy and disease but could inquire about how these concepts were applied in the real world. But in truth, the shock registered on their faces was mostly in response to the fact that these well-informed and articulate students were Black and poor. The conditions in place in their high-poverty school differed from many other low-income schools as well as in many schools populated by students from high-income families. These differences were most stark in the quality of leadership and in the professional preparation and expertise of the teachers.

The students described above were real, from Wesley Elementary School in Houston, Texas, and the fact is they were soon to exit elementary school and enter the neighborhood middle school, where they would be beaten by peers for doing their homework. To ensure that the gains made in elementary school would not be lost, the principal, the late Dr. Lott, would find other school placements where doing homework was valued. The high standards and effective instruction available in schools such as Wesley can actually be considered a one-off in many cases because there are no clear evidence-based standards that hold all schools in the K–12 continuum accountable for leadership, curricula, and teacher knowledge and practice. Even worse, the district administration was convinced that the Wesley scores were fabricated because of their belief that a school with all Black, poor students could not achieve at the level shown by the test scores. Acting on this belief, a district team barged into the school, unannounced, to readminister the tests. The scores on the retest were the same—high.

When the Wesley students visited the hospital one young fellow asked, “what happens if someone doesn’t have a good doctor?” The young physician answering the student’s question replied,

"It could very well be that the patient is harmed. But we try to make sure that never happens. We doctors have to pass many exams to do what we do. And, we take an oath to above all else, never harm a patient." Unfortunately, as happens more often than not, the academic success at examples such as Wesley do not endure. The reasons for unsustainability result from a short-sighted and fractured education system that carries out its functions unaware of the damage foisted on its students. (Note: The Wesley story comes from the direct experience of the author, Doug Carnine, and was broadcast in a Prime Time Live special with Chris Wallace in 1991, and later recounted in *Direct Instruction News*, 1992).

No doubt, medicine and other helping professions make mistakes in their professional development practices and provision of services, but they are accountable for harm; unfortunately, educators do not routinely have access to evidence-based practices and research-based resources that would allow for that same type of accountability.

Evidence as Doctrine

We have learned the regrettable fact that our education system is beset with conditions of our own doing that almost guarantee harm. We don't have a common language with which to describe our challenges, our practices, our mission, our responsibilities, and our roles. We don't have common standards to help define our goals and guide professional practices. The education profession as a whole has not demonstrated commitment to using reliable and valid measurement tools and strategies to gauge how teachers and administrators are prepared and how their training is related to the academic, social, and emotional growth of the students they will teach. And, as seen in the example of students from Wesley who were clearly motivated and engaged in learning and sharing what they knew, such achievement cannot be sustained when educational priorities and objectives shift from one state to another, from one district to another, from one school to another, from one classroom to another, and from one teacher to another. The Wesley example reveals a lack of support for success. If we cannot sustain success where it exists, scaling is a naïve dream.

Moral Imperative

Dedicated to the radical support of educators for the benefit of their students.

The glue that could facilitate a seamless bond between and among policies, professional preparation, and classroom instruction is evidence of effectiveness. This requires a common understanding and language of what constitutes evidence and how its different forms are applied and employed to inform educational decision making.

Relying on evidence to craft an education profession to serve our nation's children is a noble undertaking. It reinforces a common language about student growth. It serves to foster objectivity in our assessment of how adults are doing and how their students are doing. Evidence helps us understand the impact of short-sighted and capricious educational policies and practices on the lives and welfare of our children. Evidence can tell us to continue what we are doing, or to modify or discard what we are doing, and to learn why these different decisions must be made.

Calls for the use of evidence in educational decision making are certainly not new. A thorny impediment to realizing the power of evidence to improving student achievement, for example, is that for as long as educational practice has been codified in national, state, and local venues, the type and value of evidence has always been in the eye of the beholder. The common refrain that "my evidence is better, more reliable, more educationally valid, and more instructionally relevant than yours" is a testament to our shared ignorance of evidentiary standards, the types of evidence that are most useful for gauging student achievement in different settings, and the fact that evidence is only as useful as its replication.

The Evidence Advocacy Center

What does a profession do when confronted with the knowledge that objective data can strengthen student learning, yet that profession lacks a shared understanding of the selection and use of evidentiary strategies and tools and how they can be applied across different educational settings? This is a critical point. Numerous types of evidence produced by different research and evaluation

methodologies exist. It is incumbent on members of the profession to know which types of research designs and methods are most appropriate for the specific questions under study and which have the greatest evidence of effectiveness with varied populations. Moreover, education professionals must develop knowledge that prepares them for making informed decisions about how evidence can be applied across different educational settings. How can a profession be truly effective without a shared body of evidence-based knowledge and what is necessary to equip a profession with the necessary evidentiary knowledgebase?

This is one of the fundamental questions posed by Doug Carnine, Reid Lyon, Linda Diamond, and Kelly Butler, as they envisioned an Evidence Advocacy Center (EAC) that among its goals would be a establishing a repository of valid evidence for different education policies and practices. Each of these individuals brings decades of training and experience in the use of different types of evidence, best described in the EAC's Guide to Evidence, that are appropriate for different types of educational and instructional decisions. Led by Doug Carnine, the EAC is conceptualized and designed to address the complexity of evidence-driven systems change that models a common knowledge of what constitutes the most reliable and valid information essential to making decisions in educational settings. A quick way to understand the operation and goals of the EAC is found in its Theory of Change.

The EAC's theory of change posits that to transform education, practices informed by evidence must be understood and coordinated in a seamless as possible system, encompassing the major components of the education system. The EAC has thus identified nine teams representing the major components of the education system. Four teams represent the EAC's user audience of decision makers and advocates: institutions of higher education/educator preparation, state departments of education and policy makers, district and school leaders, and parent and family advocates. Five additional teams provide essential knowledge and evidence for the four decisionmakers to use: assessment, linguistic diversity, special education, professional development, instructional materials. This organization of

vetted research-based resources and knowledge in the form of menus across the nine teams allows EAC to provide the important resources and tools to assist decision makers in reaching these two goals:

1. Identification of vetted and curated menus of research-based resources to improve performance, in a coordinated and coherent manner, across the major components of the education system by upgrading the skills and knowledge of educators, accompanied by adequate funding that allows for manageable workloads.
2. Making evidence the basis for licensure, educator preparation programs, continuing education, and accreditation.

The rest of this paper describes a vision of a US education system that is ethical and effective. While the meaning of effective is relatively clear—significantly and permanently improving the achievement and social, emotional, and behavioral well-being of students and the skills and understanding of educators—the reference to ethical, in this context, may not be clear. Ethical means achieving educational equity for all students with special attention to the inclusion of diverse students with learning differences and other marginalized and often underrepresented groups.

Those responsible for the conceptualizing, the purpose, and the design of the EAC's structure are neither arrogant nor naive to assume that it has the capacity and resources to bring about this vision. Rather, the EAC hopes to be a catalyst to help bring about a paradigm shift in thinking about how to resolve the long-enduring US education crisis. Similarly, our treatment of this vision is neither comprehensive in terms of scope nor exhaustive in terms of explaining how the vision might be implemented.

A practical vision of an ethical and effective education system is captured in this quote that describes the status of evidence-based medicine (EBM):

Evidence-Based Medicine and Clinical Research: Both Are Needed, Neither Is Perfect

Currently, it is impossible to think of modern healthcare that ignores evidence-based medicine (EBM), a concept which relies on 3 pillars: individual clinical expertise, the values and desires of the patient, and the best available research (Sjazewska, 2018).

An education profession based on evidence also relies on the same three pillars: individual educator expertise, the values and desires of students and families (and the community), and the best available evidence. A plan for building these three pillars as a way to transform education into an evidence-based profession must be organized, actionable, trustworthy, and practical.

Element 1: An Organized Body of Actionable, Trustworthy, and Practical Evidence for Different Purposes

How does the EAC define and structure the relevant knowledge/evidence?

EAC has organized knowledge/evidence using three sources:

- a canon of evidence for how to teach, with the best available literacy, math, behavioral wellness, and later career education;
- research-based resources (RBRs) in the form of menus from our nine teams; and
- a set of reports related to policy models, licensure, accreditation, and continuing education.

This paper addresses only the research-based resources (RBRs) in the form of menus and does not discuss the canon of evidence.

EAC has recruited a team of experts for each component. They vet and compile relevant evidence in the form of menus that consist of useful research-based resources that are organized under important categories. Nine EAC teams represent major components of the education system. Some teams will develop more than one menu, some specific to literacy, some to math, and some to behavioral wellness content areas. Other teams may simply develop subsections pertaining to different content areas. The teams include the following:

- experts working with institutions of higher education that prepare educators,

- professional development provider experts,
- linguistic diversity experts,
- special education experts,
- state departments of education and policy maker experts,
- district and School administrator experts,
- instructional materials experts,
- expert and seasoned parents and family advocates, and
- assessment and data experts.

Note: Teams have been created for only those components that directly relate to student achievement and student well-being. For example, teams have not been created for finance, teacher recruitment and retention, and so forth.

A subset of resources from the Institutes of Higher Education educator preparation program's literacy menu illustrates some of the research-based resources that can be used to improve the alignment of educator preparation programs to evidence:

Resources for Course Enhancement
Model Syllabi: Variety of sample course syllabi for two-, three-, and four-course sequences. **Course Review and Planning Rubric**: Tool for reviewing the alignment of an elementary reading program scope and sequence. **NCTQ's *Teacher Prep Review***: Report on alignment course syllabi to the reading research. **Rhode Island Resource Bank for Syllabus Refinement**: Resources for enhancing alignment to the reading research, organized by domain and type. **IDA Knowledge and Practice Standards**: Standards for what reading teachers need to know and be able to do. **The Reading League Compass Guidance for EPPs**: Multitude of resources for the preparation of educators. To see all resources, visit the Compass website.
Self-Assessment: □ Fully Implemented □ Partially Implemented □ Not Implemented

Resources for Faculty Professional Learning
CORE Online Language & Literacy Academy: Online, asynchronous course for teacher preparation providers on integrating the *Teaching Reading Sourcebook* into their courses. **MSJ-NIFDI Course (Coming Soon)**: Online, synchronous course for teacher preparation providers on integrating the book *Direct Instruction Reading* into their courses. **The Reading League Online Academy Knowledge Blocks**: Online, asynchronous courses for building knowledge about reading research. **STARS in Higher Education**: Professional learning community for educator preparation providers.
Self-Assessment: □ Fully Implemented □ Partially Implemented □ Not Implemented

In addition to the menus, policy reports will also provide evidence for different purposes. As an example, to identify evidence-based policies for licensure, EAC has analyzed licensure requirements from the 50 states and summarized them in a report titled *Report of state elementary teacher certification, licensure, and training in reading science, May 2024*. The EAC is preparing a similar analysis of model state policies organized around screening and assessment, supports for schools and educators, and intervention along with the five categories that make up this National Council on Teacher Quality (NCTQ) report.

Five Policy Actions to Strengthen Implementation of the Science of Reading

The science of reading has been selected only as an example for this paper because it has been predicated on scientific studies applying appropriate designs and methods, as well as evidence from high-performing schools that have consistently produced strong student achievement results.

- Policy Action 1: Set specific, detailed reading standards for teacher prep programs.
- Policy Action 2: Review teacher prep programs to ensure they teach the science of reading.
- Policy Action 3: Adopt a strong elementary reading licensure test.
- Policy Action 4: Require districts to select a high-quality reading curriculum.

- Policy Action 5: Provide professional learning for teachers and ongoing support to sustain the implementation of the science of reading. (NCTQ, 2024)

Furthermore, the EAC will develop policy reports related to accreditation and continuing education. It is clear that accreditation organizations must be scrutinized to see how they can become evidence based. The historical reluctance of higher education preparation programs to use evidence as the basis for coursework and clinical assignments leaves far too many educators unable to make straightforward policy, organizational, and instructional decisions, thus perpetuating a culture of inadvertent ignorance among practitioners. Hope for higher education institutions to shift to responsible and accountable coursework and standards based on evidence will require patience.

What is too often overlooked is the critical and systemic development of continuing education requirements. Using evidence and accountability in continuing education programs can more rapidly produce significant and scalable gains in educator knowledge of proven practices than waiting for improvements in institutions of higher education educator preparation programs (IHE/EPPs). Given the number of new and veteran educators who were not prepared to apply standards of evidence to decision making, well designed continuing education programs have the potential to positively impact achievement and well-being of many more students in a relatively shorter amount of time. This greater potential for continuing education requirements can be quickly and simply explained by looking at the numbers. Approximately 165,000 educators are newly credentialed each year while the educator workforce numbers are in the 3 million to 4 million range. In short, 3 million to 4 million educators positively impacting students each year has far, far more potential than what 165,000 newly certified educators can be expected to accomplish.

Element 2: An Organized Suite of Implementation Tools in an Accessible Format for Quality Assurance of Evidence Use

How can the RBRs contained in these menus be readily available for and used by decision makers?

The RBRs on the menus are made accessible on the EAC website and eventually will be shared via other partner organizations and through social media. The categories within each menu organize the RBRs. These categories will be translated into key performance indicators (KPIs) to support the use of the RBRs. Implementation guides, checklists, and other tools tailored to the target audiences include key actions and guidance for the use of the resources from specific menus to achieve the KPIs. Collectively, the implementation tools and KPIs are the mechanisms to establish, support, and monitor the education system's utilization of evidence into a coherent and well-functioning whole.

The sad fact is that the supply of evidence exceeds the commensurate demand for it. Many reasons exist for this lack of demand for evidence. For example, education professionals may not have been prepared to understand and apply evidence, and too often studies in scholarly journals require knowledge of statistics that forces the reader to navigate unfamiliar vocabulary. Another reason for a lack of demand for evidence may arise from resistance to accountability and to a lack of incentives to require accountability. Demand for and appropriate utilization of RBRs is necessary for the education system to serve educators and students, families, and communities. What is needed to create this demand is to abandon the notion of research to practice and replace it with a **research to policy to practice** mindset in which the policy includes implementation tools, checklists, and KPIs that necessitate the utilization of evidence.

Strong KPIs are written as SMART objectives that are specific, measurable, achievable and relevant to the goals of evidence being used, and time bound. For example, a potential KPI for the IHE literacy menu of RBRs could be:

- By August 31, 2026, all relevant education preparation program faculty will have accessed at least two professional learning resources within the science of literacy and language.

Making the use of evidence mandatory means that evidentiary findings need to be continually updated so that the KPIs are constantly being updated as new findings are vetted.

To make the use of evidence happen, implementation resources in the form of guides, tools, and checklists will be accessible. Implementation guides and tools support our target audiences in enacting systemic change necessary to support the use of RBRs systemically and deliberately. Specifically, implementation guides, often referred to as roadmaps or blueprints, provide step-by-step guidance on the key actions needed and when to ensure the enabling conditions and supports are in place for use of the RBRs. This is accomplished by identifying and planning for potential contextual factors that may facilitate or hinder progress in the use of the evidence. Implementation guides are based on the science of implementation with robust evidence in education and health and human services disciplines (Nilsen, 2020; Fixsen & Blase, 2020).

Checklists, which are widely used in professions and have a robust research base, seem ideally suited to serve as a resource for creating and monitoring a reformed education system. State departments of education ideally would take on the responsibility for using the checklists and KPIs to ensure that each of the nine components is optimized and that the content of checklists for those components do not contradict each other; rather, the contents of the checklists for the nine components are integrated and aligned.

The checklist findings will be used by education decision makers at the state, district, and school levels, by leaders of IHEs/EPPs and by parent and family advocate groups. In addition, the checklist findings can also inform elected officials, employers, leaders of postsecondary education institutions, and social justice organizations. Using the checklist and other data resources, education decision makers will identify the following:

1. Which resources are being used and which are not?
2. What is the quality of the resources being used?
3. How well are the resources being used?

With this knowledge, education decision makers can better decide how to allocate personnel and financial resources; for example, increase funding for evidence-aligned professional learning activities for educators in specific situations.

RBR menus and the resulting KPIs, implementation tools, and checklists needed to inform decision making are essential for three reasons: to provide a sort of one-stop shopping repository, to serve as a basis for transforming education to empower educators and, at the same time, to greatly reduce outsider meddling in educators' work. (The KPIs that are required for accountability do not exist for all important elements that make use of the components of the education system. Finally, notes of caution and red flags can be added to the implementation tools and checklists for education activities that are wasteful and even could be harmful.)

Element 3: Proof of Concept of Implementing Evidence for Quality Assurance

Is the EAC system's perspective represented by the menus and the suite of implementation tools, KPIs, and checklists for the nine components viable (implementable)?

Fortunately, proof of state-level systemic use of evidence already exists, notably from Mississippi's successful reading transformation. Mississippi's success, described by Kelly Butler (2024) can be attributed to twelve critical actions that crossed all components of the education system:

- philanthropy and business acumen applied to education,
- a research phase to build a scalable model,
- educator preparation program reviews,
- licensure as a lever,
- legislative intent fostered by policy, advocacy, and a supportive dyslexic governor,
- state education agency focused on implementation and prevention,
- universal professional development and a pause on local control,
- priority schools and statewide coaching,

- high-quality curriculum aligned to evidence,
- parent notification and engagement,
- an assessment system that included screeners and diagnostics, and
- media to fuel change.

Further proof exists from districts that have, like Mississippi, significantly raised student achievement by working from evidence implementing research-based practices. In her book, *Districts That Succeed: Breaking the Correlation Between Race, Poverty, and Achievement*, Karin Chenoweth (2021) described the district-level role in sustaining school effectiveness, especially in high-poverty schools with large and diverse populations of students of color.

The EAC will determine with its collaborating partners the viability of the menus and accompanying resources (KPIs, implementation tools, and checklists), many of which are based on research-based resources such as those that informed Mississippi and the districts studied. EAC, with its collaborators such as The Path Forward (TPF) at the Hunt Institute, The Reading League (TRL), and International Dyslexia Association (IDA), will discuss the possibility of jointly convening states that are interested in agreeing to use RBRs to work toward the two goals described in our New Initiative paper published by the *74 Million*:

- improving educator professionalism, skills, and knowledge, and
- adopting a system's perspective for optimizing performance across the nine components of a state's education system.

This convening will not happen until the winter of 2024, at the earliest, for several reasons:

- EAC and its collaborators need to agree to the project.
- The collaborators will need to identify states, and then invite them.
- The collaborators will need to negotiate with the states what they are willing to do with respect to the two goals listed earlier.

- EAC needs to complete its menus for all nine categories.
- EAC is developing implementation science resources to guide the application of the menus through a scope of work with Caryn Ward at Research Triangle Institute International. These implementation science resources would be part of what the states would agree to use.

Ideally, the convening states would communicate among themselves about:

- challenges and successes in implementing the RBRs from the menu and accompanying resources including checklists to monitor actions taken to achieve KPIs,
- changes in educator and student performance over time,
- collaboration with organizations such as TPF, TRL, IDA, and NCTQ, along with a coalition of states that have already established and are implementing several of the RBRs and progress on KPIs,
- the coalition would strive to come to an agreement that all the states utilize most of the KPIs for the nine components, and
- states could request consultation to work with them on specific KPIs and on the science of implementation.

Element 4: Support From Multiple Sectors of Society for Widespread Implementation of the Evidence

Why and how may the most affected sectors of society support transforming education into an profession based on evidence?

The education system is complex and beset by fundamental professional deficiencies, conflicting ideologies, and flawed belief systems. Transforming the education profession is a monumental challenge, more difficult than the transformation of medicine, seafaring, or accounting. It will take a coordinated, consistent, thoughtful, and caring initiative led by individuals with the authority and responsibility to advocate for using evidence to reform of the US education system. Of course, public opinion and the concerns of families affected by student failure are an important influence. Because of

the magnitude of the challenge, the groups supporting the transformation will need to have sufficient collective influence to disrupt deeply held ideologies and belief systems. EAC is reaching out to representatives of those groups to form an EAC advocate advisory panel.

The use of KPIs provides transparency relevant for these sectors to understand the relative performance of each component and what the implications for budgeting might be.

Element 5: Evaluation of the implementation of the evidence

How do we determine if the EAC systems perspective approach to transforming the US education system benefits outcomes for educators and students, and families and communities? Empirical evaluations of a systems perspective on the US education system, as described in this paper, are essential. The challenge is to realize results in as timely a manner as possible. Becoming an evidence-based profession means that after the first two years of implementation, achievement gains may be minimal. However, progress should be demonstrated in implementation measures such as changes in teachers' and leaders' knowledge, beliefs and practices. The use of implementation measures is imperative for ongoing improvement of evidence use. But thereafter the improvements would hopefully be cumulative, in that kindergarten students when they reach end-of-year testing for grades 2 or 3 would see the greatest effects in comparison to prior years (given stability in the composition of the student demographics).

Element 6: Scaling the Implementation of the Evidence

How would/could a system's perspective become viable for more states?

Moving from proof of concept with a few states to widespread scaling with other interested states will require careful planning in a staged process with continuous engagement of stakeholders and support from multiple sectors of society.

Conclusion

The accomplishments of the 10 Wesley students represent the aspirations of an ethical and effective education system. The failure of Wesley Elementary to sustain its very successful program is a symptom of the depth of the ongoing education crisis. A solution calls for a viable, comprehensive, and coherent plan commensurate with the scope of this mammoth problem. This paper argues that any such plan should contain the six elements described above. The EAC is not asserting that these are the only elements needed for a reform plan (for example, budgeting is an essential element), but rather that at least these six are needed for a plan to be viable. It is time to stop snatching defeat from the jaws of victory. Only then will we empower educators to better serve their students and communities, and only then will our education system be truly ethical.

REFERENCES

Association for Direct Instruction. (1992, Winter). *Direct Instruction News*, *11*(2), 1–3.

Butler, K. (2024). The long view of literacy in Mississippi: Major components that contributed to reading achievement in Mississippi . . . and beyond. *The Reading League Journal, 5*(2), 51–59.

Chenoweth, K. (2021). *Districts that succeed: Breaking the correlation between race, poverty and achievement*. Harvard Education Press.

Fixsen, D. L., & Blase, K. A. (2020). Active implementation frameworks. In P. Nilsen & S. A. Birken (Eds.), *Handbook on implementation science* (pp. 62–87). Edward Elgar Publishing.

National Council on Teacher Quality. (2024). State of the states: Five policy actions to strengthen implementation of the science of reading. https://www.nctq.org/pages/State-of-the-States:-Five-Policy-Actions-to-Strengthen-Implementation-of-the-Science-of-Reading#Five

Nilsen, P. (2020). Overview of theories, models and frameworks in implementation science. In P. Nilsen & S. A. Birken (Eds.), *Handbook on implementation science* (pp. 8–31). Edward Elgar Publishing.

Szajewska, H. (2018, April 18). Evidence-based medicine and clinical research: Both are needed, neither is perfect. *Annals of Nutrition and Metabolism*, *72*(Suppl. 3), 13–23. https://doi.org/10.1159/000487375

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