A Call to Action: Education Desperately Needs a Knowledge Management System Based on Evidence

by Doug Carnine and Linda Diamond

Executive Summary

This article emphasizes the need for the field of education to create and implement a Knowledge Management System (KMS) that provides clear, trustworthy guidance and guardrails for educators. Used in professions such as medicine and law, Knowledge Management Systems involve the ongoing process of creating, identifying, managing, and structuring knowledge for effective and efficient use by members of an organization or profession. A KMS comprises a repository of written documentation, which is accessible through online databases and websites. These documents are used by members of a profession to define and regulate the key elements, practices, and protocols in their designated field and to lay out the coursework, training, and specialized knowledge required to become a licensed practitioner. Having such documentation in a KMS has, for example, enabled medical doctors to make proper diagnoses and quickly identify effective treatments and then share knowledge across the profession. A KMS would permit educators to reap these same benefits.

The field of education currently lacks a central KMS. In the absence of a centralized KMS, education practices will continue to be inefficient and widely variable in terms of effectiveness

For example, scientific research has clearly established effective practices and the necessary components for teaching beginning reading. Nonetheless, school districts throughout the country have continued to adopt unproven and ineffective teaching practices that fail to achieve acceptable results. In response, 40 states and the District of Columbia have passed laws to regulate the technical details of how educators should teach beginning reading. Such regulation is unique to education and is clearly caused by the field's repeated failure to achieve strong student results. The fact that states must step in to regulate the practices used to teach beginning reading—a content area where scientific research has already established effective practices—illustrates the field's dysfunction. By implementing a central KMS, education could simultaneously eradicate ineffective practices and create a trustworthy field. While doctors, lawyers, accountants, and other professionals are subject to specific state regulations, such as privacy laws, tax codes, building codes, and accountability specifications, the actual technical aspects of their professions are determined by the KMS that is unique to its given field. As the medical profession exemplifies, however, a KMS does not prevent serious issues from permeating a profession on the national[1] or regional[2] levels. A KMS does, however, cohere system-wide regulations and protocols that preclude the need for quality control through the sort of state legislation precipitated by the education crisis.

The crisis of trust in the U.S. education system became official in 1983, when the National Commission on Excellence in Education (NCEE) released "A Nation at Risk" (ANAR)

[1] A KMS, for example, failed to prevent the opioid epidemic caused by Purdue Pharma, which necessitated intervention by the Department of Justice (U.S. Department of Justice, 2024).

[2] As the Dartmouth Atlas Project has documented, for myriad reasons "glaring variations" exist within medical care on the local levels (Wennberg, 2020). Like medicine, education will likely also see local variations that will impact the quality and effectiveness of instruction. A KMS, however, can illuminate these variations by providing a national standard against which to measure local practices.

report, which ushered in an age of reform. Forty years later in 2023, the Hoover Institution initiated a review of the effectiveness of these reforms, aptly named "A Nation at Risk + 40." In her analysis of the 12 published reports authored by scholars and thought-leaders, Margaret Raymond observes: "The one thing we may have conclusively proven is that the system, as presently constituted, has been resilient [resistant] to reforms at scale" (2024).

In response to this resistance and to the failure to sustain and scale effective reforms, the Evidence Advocacy Center (EAC) was launched in 2023 to advocate for the urgent need for systemic change. The EAC recognizes that education is the foundation upon which all other professions depend. Reading, writing, mathematics, reasoning, and critical thinking must be taught by a strong education profession, as these skills are essential for those professions that have their own KMS. The EAC's mission is to help professionalize education by elevating the existing evidence and research from trustworthy organizations that currently provide evidence- and research-based resources and policy reports. The EAC will serve as a catalyst and advocate for the creation of a collaborative to plan, implement, and sustain a KMS for education. This initiative will focus on unifying representatives from five leadership groups: educators, researchers, consumers, funders, and elected officials. Each of these groups will play integral roles in developing and implementing the KMS. The collaborative will seek to position the KMS as a cornerstone of professional practices.

Historically, professions have resisted reforms at scale (Porter, 2020).[3] For example, the medical profession's adoption of a KMS was a drawn-out, contentious process, which lasted

[3] In his book *Trust in Numbers*, historian Theodore M. Porter examines the pressures that forced select professions to move from subjective judgments toward quantifiable evidence-based judgments.

over a century. Once a given profession eventually adopts a KMS, however, the foundation it provides allows for reforms at scale. The medical field, in particular, implemented massive nation-wide changes in response to the Flexner Report, "a seminal document that subsequently raised the standards for general education in medicine and psychiatry" (Stahnisch & Verhoef, 2012, Conclusion).[4] In addition, most professions (unlike education) have a KMS that allows them to self-regulate, a right that legislation in 40 states and D.C. has arguably withdrawn from the field of education.

This article argues that the U.S. achievement crisis could be resolved, or, at least, alleviated by implementing a KMS for education. A formal KMS enables a profession to cohere around a body of written research-based resources and canon of rules, regulations, and agreed-upon norms that facilitate self-regulation. In particular, professionals within a KMS-based field receive extensive training, perform clearly defined roles, and are held to account for properly applying their profession's specialized knowledge-base. The programs that train and educate these professionals are also periodically reviewed to ensure that they are rigorous and comprehensive enough to pass accreditation standards. Without a sanctioned and universally agreed upon KMS, the field of education will continue to fail to adequately prepare educators, to regulate licensing exams, to hold educators accountable for the application of a specialized knowledge-base, or to define the job requirements for those working in state departments of education, school districts, and educator preparation programs (EPPs). This paper describes

[4] According to Stahnisch and Verhoef's essay on the impact of the Flexner Report, "America experienced a genuinely vast development of biomedical science in the early decades of the twentieth century.... This development was largely based on the restructuring of research universities in both of the USA and Canada following the influential report of Johns Hopkins-trained science administrator and politician Abraham Flexner (1866–1959)" (Abstract).

several examples of why the failure of the education system to adequately prepare and maintain a skilled educator workforce has contributed to the need for the legislation that was passed in 40 states and D.C. Recent studies report[5] five areas of particular concern:

1. clinical practice, in which 91% of the programs received a grade of C or below
2. licensure, in which over half of the states do not require elementary educators to take an evidence-based exam for literacy instruction
3. educator preparation programs (EPPs) that teach reading foundations, among which 72% of the programs were rated as inadequate
4. accreditation, in which 72% of programs were rated as inadequate, yet all still received accreditation despite their poor ratings
5. accountability mechanisms for adherence to a professional knowledge base and to evidence of effectiveness, which are altogether absent

A universally adopted KMS for the field of education would provide research-based knowledge and create a canon that regulates training, licensure, and job requirements. It would also provide a means of holding educators accountable for implementing the profession's knowledge base as well as inform policies that determine the shape and scope of major components of the education system, including, for example, state departments of education, school districts, policymakers, and institutions of higher education EPPs. Until these components of a KMS for education are developed and implemented, most reform efforts will

[5] For a more detailed review of these studies, please see Carnine's report on "The Need for an Educational Evidence Base: An Overview of the Evidence Advocacy Center" and "The End Game for the U.S. Achievement Crisis," as well as this essay's section titled "NCTQ and EAC Reports Reveal a Need for Improving the Educator Workforce."

continue to fail. As with the field of medicine, however, the transformation of the field of education into a KMS-based profession will not happen quickly.

Unless a KMS is created and implemented for education, an article published 40 years from now is likely to deserve the same title as Raymond's 2024 analysis, with the timeline doubled: "A Lot Has Changed in the 80 Years After 'A Nation At Risk.' But the School System? Not So Much."

A Call to Action: Education Desperately Needs a Knowledge Management System

by Doug Carnine and Linda Diamond

To address weak reading skills in the United States "40 states and the District of Columbia have passed laws or implemented other policies related to evidence-based reading instruction since 2013" (Schwartz, 2022).[6] The most recent report by the National Assessment of Educational Progress (NAEP) states that only 33% of fourth grade students performed at or above the proficient level in reading. In addition, NAEP reported a persistent racial/ethnic reading achievement gap.[7] Spurred, in part, by this gap, legislators and governors have felt compelled to specify the technical details of educators' reading instruction requirements. The legislation was passed for four main reasons:

1. Sixty-seven percent of children in fourth grade, particularly those from marginalized communities, have been failing to reach the NAEP proficient standard of achievement, which represents solid academic performance and competency over challenging subject matter.

[6] This figure states the tally as of October 11, 2024, which was the last time the online article was updated prior to the publication of this document.

[7] The latest report figures are from 2022 and can be found in the NAEP link above.

2. Reports indicate that most educators have been teaching beginning reading using non-evidence-based methods that have proven ineffective and contribute to high failure rates.
3. On the other hand, evidence from Mississippi, where schools implemented practices aligned with the Science of Reading (SoR), demonstrated that strong reading achievement gains can be made when educators use proven practices.[8]
4. Emily Hanford's "Sold a Story" podcast series, which investigates the nation's reading crisis and highlights successful interventions, caught the attention of politicians and the public (2022).

The state laws that specify the technical details of how educators should perform their roles are effectively replacing educators' decision-making. The need for such top-down direction calls into question whether education qualifies as a profession. This uncertainty warrants further exploration and underscores the need to define the key traits of a professional field.

In 2015, Tapper and Millett reviewed 21 working definitions that aimed to clarify the nature of a profession. In their synthesis, Tapper and Millett identified six elements common to most of the working definitions of a profession, including:

1. an ideal of service and responsibility to the public good
2. a code of ethics or shared ethics
3. a body of specialized knowledge on which it is based and on which it builds
4. a requirement for intensive training and formal qualification

[8] For more detail on the strong gains among third-grade students in Mississippi, see the Mississippi Department of Education online report.

5. the acquisition and application of specialized knowledge
6. operation as a self-regulating community

A KMS Defines a Profession

The field of education arguably includes an ideal of service and responsibility to the public good and a code of ethics. The field, however would benefit from a sustained, nation-wide commitment to the use of evidence and proven practices. As a result, this paper will focus on elements three through five of Tapper and Millet's list, each of which entails the process of creating, identifying, managing, and structuring knowledge for effective and efficient use by members of a profession. These three elements, which codify the acquisition and implementation of professional knowledge, enable a field to accomplish the sixth element, self-regulation. To summarize, the four elements not fully developed or fully functional in the field of education that are typically found in a profession's KMS include:

3. a body of specialized knowledge on which a profession is based and on which it builds
4. intensive training and formal qualification
5. the acquisition and application of specialized knowledge
6. operation as a self-regulating community

Knowledge management (KM) has typically been defined in the context of organizations. This paper, however, has been inspired by the impact of KM on the quality of professions. Within the field of medicine, for example, the introduction of a KMS provided much-needed support for doctors, enabling them to improve patient outcomes. The EAC believes that implementing a KMS for the field of education can offer similar benefits, providing much-needed support for educators that can significantly improve student outcomes.

Among its many benefits, a KMS provides a hub for information and support. As the medical knowledge-sharing platform Starmind explains: "modern knowledge management for healthcare teams can provide quick and accurate information, empower decision-making, and offer expert support for employees and patients alike" (2022). A KMS has benefitted doctors by enabling them to search for information on symptoms, procedures, and treatments to make better diagnoses and to prescribe the most effective interventions. It has also improved collaboration by helping doctors share knowledge. Similarly, the KM platform Document 360, which is popular in finance, states that "knowledge management systems play a vital role in the finance industry by enabling efficient information sharing, collaboration, and decision-making" (2024). These same benefits can accrue to educators, allowing them to share learned knowledge and to easily identify and use effective and proven instructional methods as well as standardized procedures to diagnose and intervene when students struggle to learn. Even the self-regulating field of plumbing uses KM to distinguish it as a profession. As a KMS expert explains, unlike a plumber, a handyman does not have to be certified to perform certain tasks. Rather, "the handyperson can glue, sweat, or cramp your pipes to fix minor leaks. The certified plumber knows the correct laws, regulations, and methods to ensure that your pipes pass inspection" (Antill, 2021).[9]

The Field of Education Lacks a KMS

A straightforward way to demonstrate that the field of education does not have a KMS is to look at the importance of KMSs in other professions. For the most part, states do not pass

[9] This article by John Antill, a knowledge manager with US Army Expeditionary Workforce, can be found on RealKM, a website founded in 2015 to publish "high-value knowledge management research through concise, practically-oriented articles" and to "support emerging initiatives that are shaping the future of KM."

legislation specifying the technical details of how professions, such as medicine, law, and accounting, carry out their day-to-day responsibilities. This lack of legislation suggests that having a KMS enables each of these fields to successfully self-regulate. It also demonstrates that these professions are perceived as being trustworthy enough to manage their specialized fields. In comparison, the fact that 40 states and D.C. have felt compelled to legislate the field of education underscores widespread distrust in the field's capacity to regulate itself.

Figure 1

Legislative Technical Specification of Professional Behavior

Legend:

Y means that legislation specifies the technical details of professional behavior

N means that legislation does not specify the technical details of professional behavior

State obligation	**Education**	**Medicine**	**Sea Faring**	**Accounting**	**Law**	**Plumbing**
Specify Professional Tools	Y	N	N	N	N	N
Specify Training Content	Y	N	N	N	N	N
Specify Content for Professional Preparation that Leads to Licensure	Y	N	N	N	N	N

[Developed by Douglas Carnine 2024]

Figure 1 above illustrates that states specify the technical knowledge and skills required of educators but do not impose similar requirements on other professionals. This suggests that states intervene in education because the field lacks a KMS and that those fields with a robust, trustworthy KMS are able to effectively self-regulate, precluding state legislation.

A brief examination of the legislation passed by multiple states to regulate the science of reading (SoR) demonstrates just how dire the situation has become. According to the Council of Chief State School Officers (CCSSO), state-legislated SoR regulations should stipulate the following:

1. "state obligation to provide SoR-based instructional materials [i.e., professional tools] that do not include practices not aligned with SoR"
2. "state obligation to train educators in SoR"
3. "obligation of educator preparation programs (EPPs) to train aspiring educators in SoR"
4. "state obligation to involve and communicate with partners," educators, and stakeholders to ensure success of new policies (CCSSO, nd)

To better understand why states feel compelled to legislate educators' own decision-making, consider contrasting examples:

1. States do not specify the instruments and tools used by doctors, lawyers, plumbers, CPAs, and sea captains, for example. In contrast, because education lacks a KMS and results have been poor, many of the states that passed SoR legislation determine the specific instructional materials and assessments educators are to use.
2. Professions that have KMSs provide their own training content, whereas some states with SoR legislation determine the specific training providers and training content that educators must use.
3. State legislation does not require reviews of the technical details of the content presented in preparation programs for professions with a KMS, but some states require

audits of EPPs due to their failures to prepare educators to effectively teach reading based on a body of evidence and specialized knowledge.

Whereas KMS-based professions can self-regulate, the field of education has failed to implement the elements of a KMS needed to regulate itself. This failure has had widespread negative impacts on educators and students alike. Other professions are able to successfully self-regulate because they each possess a trustworthy KMS that enables practitioners to provide consistent positive benefits to their clients. Consequently, legislation does not need to dictate the exact technical details of their professional practices because those professionals already operate from a set of evidence-based procedures within their own KMS.[10]

Even though the medical profession has a robust KMS, physicians do have discretion to determine specific treatments based on their patient knowledge and on their understanding of the various treatments. Medicine, however, still faces multiple challenges (as do all professions). For medicine these challenges include limited-service availability, insurance requirements, and state laws that regulate ethical conduct (e.g., 4 Healthcare Regulations You Need To Know).[11] Medicine has also struggled to regulate fraud[12] and to prevent unwanted variations in patient

[10] There is one case in which legislation does specify the technical details of how professionals carry out their work. That exception is nursing, as explained in the Nursing Practice Act through which states specify the technical details of how nurses are to carry out their professional responsibilities (Boehning & Haddad, 2023). On the other hand, nurses are guided and constrained by a KMS that is included in virtually all nursing programs. The KMS provides nurses with the requisite skills and knowledge of the human system and of disease and wellness management to be able to comply with the Nursing Practice Act.

[11] Amber Ratcliffe's article "4 Healthcare Regulations You Need to Know" appears on MedTrainer, a platform founded in 2013 that works to streamline healthcare compliance and to gather the resources needed to respond effectively to changing regulations.

[12] For a glaring example of fraud see "Today, the Department of Justice announced a global resolution of its criminal and civil investigations into the opioid manufacturer Purdue Pharma LP (Purdue)" (U.S. Department of Justice, 2020).

treatment.[13] The medical field recognizes that its knowledge base and, hence, its KMS will continue to evolve, which is why, in part, it includes the field of iatrogenicity, which studies "any injury or illness that occurs as a result of medical care" (*Taber's Cyclopedic Medical Dictionary*, 2013).[14]

Why the Field of Education Is Not Seen as Trustworthy

The findings below provide evidence that demonstrates why the field of education has not been deemed trustworthy in preparing and maintaining a well-qualified educator workforce and needs a KMS. Reports from the National Council on Teacher Quality (NCTQ) and other organizations document the current inadequacies of the field of education. The methodology used by the NCTQ permits individual EPPs to decide which documents to submit for detailed review, analysis, and evaluation. This process can lead to inconsistencies that compromise the accuracy of the NCTQ's conclusions (2023). While these findings and reports focus primarily on literacy, similar analyses are needed for mathematics and behavioral wellness.

NCTQ and EAC[15] Reports Reveal a Need for Improving the Educator Workforce

1. **Clinical Practice**: NCTQ's 2020 teacher preparation review of clinical practice and classroom management reported that in the area of reading 3% of programs received an

[13] As the *Dartmouth Atlas of Health Care in Michigan* reports, unwanted variations in treatments occur because "the amounts and types of care provided are highly dependent on two factors: the capacity of the local health care system (which influences how much care is given) and the practice styles of local physicians (which determine what kind of care is given)" (Wennberg & Wennberg, 2000).

[14] As cited in Barr, J. & T. Kauffman's article "Iatrogenesis in older adults," which explains that "an iatrogenic condition is a state of ill health or adverse effect caused by medical treatment; it usually results from a mistake made in diagnosis or treatment, and can also be the fault of any member of the healthcare team" (2014).

[15] The Evidence Advocacy Center has conducted an analysis of the education system that identifies nine major components, two of which are higher education institutions and state departments (Carnine, 2024, p. 4).

A, 6% received a B, and 91% received a grade of C or below (Pomerance & Walsh, 2020, p. 6).

2. **Licensure**: An EAC review of literacy licensure exams for elementary educators reports that fewer than half of the states have strong licensure exams that are based on evidence (2024c, pp. 26–29).
3. **Educator preparation programs**: NCTQ's teacher preparation review of reading foundation standards (2020) reports that 28% of the literacy portion of EPPs are rated as adequate or better, which means that 72% of the programs that were reviewed were scored as inadequate.
4. **Accreditation**: Even though 72% of the programs were rated as inadequate by the NCTQ evaluation, all are accredited. In response to these alarming figures, the EAC has begun a detailed review of the role of evidence in the accreditation of EPPs. While many states accredit these programs, others use national accrediting organizations like the Council for the Accreditation of Educator Preparation (CAEP) and the Association for Advancing Quality in Educator Preparation (AAQEP) with little reference to evidence. In contrast, the content of accreditation in many professions is standardized internationally; for example, the Accreditation Commission on Colleges of Medicine in Ireland has technical content nearly identical to other countries, including the United States.[16]

As the above figures show, reform efforts continue to falter. They will continue to do so without a KMS guiding and constraining the preparation and maintenance of the educator work force.

[16] As the organization describes on its website, "The Accreditation Commission on Colleges of Medicine is an independent, not for profit organisation based in the Republic of Ireland."

KMS Policies Needed for the Key Components of the Education System

Creating and implementing a KMS for education has the potential to improve EPPs and continuing education, which could, in turn, lead to a well-prepared and supported educator workforce. With a KMS, educators, like physicians, will be better able to use their discretion in choosing research-based practices and materials based on knowledge of their students and on their understanding of the field's specialized knowledge. Improving the workforce alone, however, is not enough to transform the field of education. Policies must also be implemented that embed the KMS in key components of the education system, including state departments of education as well as among policymakers and among district and school leaders and systems. The nonprofit education policy organization ExcelinEd's Comprehensive Early Literacy Policy report identifies fewer than 10 states that met all of the criteria for each of the reviewed policy areas (2024). Some states met fewer than half the criteria for the reviewed policy areas. An EAC report on state-level models for literacy policy is nearing completion. To date, the EAC review has identified at least four states that offer exemplary literacy policy models. With a universally accepted KMS, however, all states will be able to have exemplary policies for all components of the education system in at least the following eight areas:

1. Standards for EPPs
2. EPP Approval and Renewal
3. Elementary Reading Licensure Tests
4. High-Quality Curriculum
5. Professional Learning
6. Screening and Assessment

7. Support for Schools and Educators
8. Intervention for Students Needing More Reading Support

Reform Efforts Will Continue to Falter Without KMS-Based State Policies

Although KMS-based professions, such as seafaring, medicine, law, accounting, and aviation, are not without flaws, they meet the requirements of the four key elements[17] of a professional KMS as identified by Tapper and Millett. In contrast, in the area of strong literacy licensure exams, education scores 37%, according to the NCTQ. Imagine if only 37% of states required doctors, sea captains, CPAs, or pilots to pass legitimate licensure exams! Due to the current teacher shortage, policymakers are hesitant to impose high standards for initial licensure and also for the continuing education required for license renewal. Over the long term, however, we must not treat education as a second-rate profession in which practitioners are allowed to work without mastery of essential knowledge and skills. Would we allow individuals without the necessary qualifications to practice as doctors, sea captains, CPAs, or pilots because of a personnel shortage?

Instead of being guided by a KMS, the field of education is often beset by conflicting ideologies and dysfunctional belief systems.[18] This disarray and conflict, in turn, will lead many educators to oppose and actively resist a KMS for education. To create and implement a KMS requires active involvement by those who provide the services day in and day out to America's children—namely, teachers, principals, and district leaders.

[17] To recap, the four elements for a KMS include: 3. a body of specialized knowledge on which it is based and on which it builds 4. a requirement for intensive training and formal qualification 5. the acquisition and application of specialized knowledge 6. operation as a self-regulating community.

[18] For a discussion of these problems, see Carnine's "The End Game for the U.S. Achievement Crisis," pages 7–25.

Toward a Trustworthy KMS for Education

Resolving the U.S. education crisis will be impossible without a trustworthy KMS for the field of education. A vetted KMS based on the most reliable science and research available in education would provide all educators with the guidance needed to make a substantial impact on the lives of their students—an impact many educators aspire to achieve. Moreover, a KMS would reduce, though not eliminate, legislative mandates dictating how educators should perform their duties. Over 30 years ago, Carnine (1992) argued that educators should not be blamed for the field's failures because the education system does not adequately prepare and support them. In the words of W. Edward Deming, a master of continuous quality improvement, "A bad system will beat a good person every time." Educators are trapped in a broken system that frequently undermines their field. Educators deserve to have a KMS that supports their commitment to make a difference in the lives of their students. Consequently, the field of education needs a body of specialized knowledge that requires educators to undergo intensive training and formal qualification to demonstrate mastery of their profession. Creating and implementing an effective KMS built on evidence- and research-based resources and practices will require an advocate that will address all components of the education system.

The EAC's Contributions to an Education KMS

The legislation passed by 40 states and D.C. has sounded an alarm signaling that the field of education is suffering an ongoing emergency. Four educators, Doug Carnine, Reid Lyon, Kelly Butler, and Linda Diamond, responded to this alarm by launching the Evidence Advocacy Center (EAC). With two centuries of education reform experience among them, EAC's founders believe this emergency can be treated and cured, to a significant degree, by a robust, trustworthy KMS.

Their sense of urgency was fueled over the years as they watched hard-won successful initiatives at the state, district, and school levels eventually fail because they were often not adequately funded and maintained or effectively monitored and supported. Upon realizing that improvements are doomed because the U.S. education system itself is broken, the founders determined to launch EAC to help catalyze systemic transformation.

Focused Expertise

The EAC has organized itself to focus on nine important components of the education system:

1. state departments of education and policymakers
2. school and district leaders
3. EPPs in institutions of higher education
4. parent and family advocate groups
5. professional development
6. instructional materials
7. assessment
8. linguistic diversity needs
9. special education

The EAC staff comprises over 100 volunteer professors, researchers, and advocates who are experts in their own rights. The organization includes an executive committee, an evidence advisory panel, and nine teams of experts. Each team has been designated to focus on one of the aforementioned nine components of the U.S. education system. Four of the nine teams represent the decision makers and advocates who significantly impact the quality of education

for America's students. These four teams include state departments of education officials and government policymakers, district and school leaders, EPPs in institutions of higher education, and parent and family advocate groups. The EAC does not compete with organizations such as the Institute of Education Sciences (IES). In fact, vetted organizations provide many evidence-based resources the EAC elevates. Instead, the EAC curates resources provided by the IES and other trustworthy organizations, enabling ready access by state departments of education officials and government policymakers; district and school leaders; institutions of higher education EPP faculty, deans, and provosts; and parent and family advocate groups. The five remaining teams (assessment, linguistic diversity, special education, professional development, and instructional materials) provide many other evidence-based resources and effective evidence-based practices to be used by the decision makers and advocates noted above.

Defining Evidence and Curating Its Role in EAC Resources

Because evidence-based knowledge provides the foundation for a KMS, the EAC has built upon evidence in the field of education. A solid foundation for specialized knowledge already exists, especially in the field of reading. This specialized knowledge has been compiled by vetted organizations such as the Institute of Education Sciences (IES), a governmental agency that relies on research from randomized and peer-reviewed controlled studies. Educators, however, need guidance in many areas where no clear evidence-based practices exist. As a result, the EAC also curates research-based resources from high-performing educators, school districts, and states. As used by the EAC, the term "research-based" denotes a practice or program that has been informed by certain methodologies. These include efficacy studies, quasi-experimental and randomized control studies, mixed methods studies, and evidence of

strong student achievement that has resulted from the implementation of effective practices in real world settings.

Both evidence- and research-based practices create and validate knowledge. As the EAC's "Guide to Evidence" explains, however, these practices differ in important ways:

> Research-based practices within education ... provide a theoretical foundation for determining through further study if those practices can become evidence-based and offer guidance for educational policies and practices (Petticrew & Roberts, 2020; Springer, 2020). While research-based information is essential for both theoretical grounding and providing guidance, evidence-based practices ensure practical reliability through repeated empirical validation. Evidence-based practices go beyond theory to confirm effectiveness in real-world contexts, which is especially valuable in educational settings where consistent outcomes are required (Greenhalgh & Papoutsi, 2019).

In other words, promising research-based practices may advance to evidence-based studies in order to determine if they are effective in real-world settings. Both research-based and evidence-based resources and practices are drawn from a range of fields, including cognitive science, education psychology, education research, learning science, implementation science, as well as from documentation of significant improvement in student achievement.

In order to provide educators with access to a range of vetted resources, the EAC menu items include scientific and experimental studies, documentation of proven and usable practices, research papers and policy papers, webinars from expert researchers, results from high-performing educators and education systems, and links to those online resources currently available through vetted organizations. By including these types of resources and reports—

those based on controlled studies and those based on proven effectiveness in the classroom—the EAC's menu items reflect the broader definition of evidence provided in "What Is 'Evidence-Based' as Defined by the Every Student Success Act?" [19] Many of the resources that the EAC curates translate scientific research into usable practices and policies.[20] The EAC is also in the early stages of developing documents, called canons for literacy, math, and behavioral wellness, that use the already existing objective evidence that specifies what students need to learn and how best to teach the necessary content.

The nine teams are developing menus of research-based resources as well as practices that have been used effectively by high-performing schools and districts with diverse populations, all of which can become part of the KMS for education. These resources and the canons will allow educational leaders to:

- recognize the interdependence of all components of the education system
- find research-based resources for specific components
- determine the degree to which the components are functioning adequately
- plan how to implement and improve the functioning of the components and their integration

Additional EAC Resources

[19] According to an article on efficacy trials "Intervention studies can be placed on a continuum, with a progression from efficacy trials to effectiveness trials. Efficacy can be defined as the performance of an intervention under ideal and controlled circumstances, whereas effectiveness refers to its performance under 'real-world' conditions. However, the distinction between the two types of trials is a continuum rather than a dichotomy, as it is likely impossible to perform a pure efficacy study or pure effectiveness study" (Singal et al.).

The EAC is creating reports on initial licensure, accreditation, and continuing education for license renewal. It is also completing a report on states with model literacy policies and practices. Because a large body of evidence already exists on the most effective ways to develop beginning reading skills (e.g. National Institute of Child Health and Human Development's Report of the National Reading Panel, 2000), the EAC's initial focus has been on literacy, but it also addresses math and behavioral wellness. In its essay "Envisioning an Ethical and Effective US Education System," the EAC describes three categories of resources and tools that the organization can provide to help build a KMS for the field of education. These include:

1. an organized body of trustworthy and practical evidence from the IES and other organizations, including the research-based resources from the nine teams and the canons in literacy, math, and behavioral wellness
2. an organized suite of accessible tools for quality assurance of the implementation of research-based resources and practices to be useful for state departments of education officials and government policymakers; district and school leaders; institutions of higher education EPP faculty, provosts and deans; and parent and family advocate groups
3. proof of concept of effective use of evidence in education as demonstrated by improvement of student outcomes, educator efficacy (determined through surveys), and state department of education policies and procedures

The EAC has identified six elements that are necessary in any plan to transform education into an evidence-based profession that relies on a KMS. These plan elements include the three categories above as well as three additional elements:

4. support from multiple sectors of society for widespread implementation of the evidence and a resulting KMS, starting with reading and literacy
5. evaluation of the implementation of the use of evidence which informs a KMS, starting with reading and literacy
6. scaling the implementation of an evidence-based KMS, starting with literacy

These last three elements of the plan require a collaborative process, discussed below in the Next Steps section.

By promoting the existing research-based resources and the organizations already focusing on the use of evidence in education, the EAC and its partners will advocate for and set the stage for the development of a KMS for education. Most current partner organizations are ones that focus on literacy—The Reading League, The Path Forward, and the National Center on Improving Literacy. Partner organizations also include Positive Behavioral Interventions and Supports Center, which focuses on behavioral wellness, and the math-focused group of experts who launched The Science of Math website. Learning science partners also include Deans for Impact. The Institute of Education Sciences, while not a direct partner, is an essential organization for the reliable sources of evidence needed to develop a KMS for education. By elevating these reliable organizations and their resources and networks, the EAC has the ability to help assemble the content necessary to build a KMS for education. In short, the existing evidence-based resources in education are sufficient in number and quality to build a trustworthy KMS.

Initiating a Collaborative

Establishing and sustaining a Knowledge Management System (KMS) for education is a complex endeavor. The Evidence Advocacy Center (EAC) does not contain the staff or have the expertise to independently develop a universal KMS. Therefore, the EAC intends to serve as an advocate and catalyst to foster a collaborative initiative that will lead this effort. This initiative intends to unify representatives from five leadership groups: educators, researchers, consumers, funders, and elected officials. Each of these groups will play integral roles in developing and implementing the KMS.

Leadership Groups

The five leadership groups will represent a variety of individuals involved in or impacted by the field of education. These include:

- **Educators:** Education organizations, knowledge-aligned educator preparation programs, and high-performing state, district, and school-level educators
- **Researchers:** Experts contributing to the specialized knowledge base for education
- **Consumers:** Business, social justice groups, post-secondary institutions (except for educator preparation programs), as well as parents and families advocating for improved student outcomes
- **Funders:** Foundations and federal bodies ensuring financial support
- **Elected Officials:** Policymakers influencing legislative backing

The representatives for these five leadership groups must be people who acknowledge the dire need for a KMS in education and who are willing to engage in exploring how an education collaborative might be created and implemented.

Goals

The Collaborative will seek to position the KMS as a cornerstone of professional practices, including the accreditation of educator preparation programs, educator coursework, clinical supervised practice, licensure testing requirements, and licensure renewal and continuing education. The initial focus will be on beginning reading, enabling the Collaborative to harness the existing media coverage and legislative momentum galvanized by the literacy crisis. Next, the Collaborative will address behavioral wellness and math. The Collaborative will be structured into hybrid work teams drawn from the leadership groups that focus on the following tasks:

1. developing a specialized knowledge base
2. designing initial educator licensure, required course work, licensure renewal, and continuing education
3. revising accreditation processes for educator programs to align with KMS-based licensure requirements
4. refining accountability-aligned role descriptions for educators
5. identifying funding needs, conducting cost analysis, and determining potential funding sources

Leadership Roles

The five leadership groups will participate in the Collaborative work teams in a variety of ways. Although each group will have designated goals and specializations, they will also cross-collaborate with the other work teams. Educators and researchers are vital to tasks 1 through 4. Funders, while essential to task 5, will also have representatives in all the work teams to

determine the scopes of work that might be fundable and how these scopes of work should be framed for fund-raising purposes. The resources of the EAC and other similar organizations could be a starting point for developing the knowledge base. The consumers and elected officials will advocate for creating and implementing an education KMS and also shape its priorities. Their perspectives, in turn, will help guide the other work teams. EAC's parent and family advocates team, which is comprised of parents from literacy champion organizations across the United States, can be aided and informed by elected officials and representatives from the other teams to organize grassroots efforts to improve literacy instruction that can lead to significant improvement in student outcomes. The business community could be energized to advocate for the state and national policies needed to create and implement a KMS should the EAC succeed in recruiting leadership members from the National Federation of Independent Business, which represents smaller businesses, and the Chamber of Commerce, which represents larger businesses.

Work Team Recommendations

Sequence of Activities:

1. Develop the Specialized Knowledge Base: Establish a foundational starting point for use by subsequent Collaborative work teams.
2. Specify requirements for licensure: Use the knowledge base to develop requirements for initial licensure and licensure renewal.
3. Create EPP guidelines and continuing education content: Draw on the licensure requirements as well as on the content of the knowledge base that is not incorporated in the requirements.

Both 4a and 4b can be carried out concurrently.

4a. Establish criteria for accreditation: Ensure that accreditation requirements align with licensure requirements.

4b. Generate role descriptions for educators: Align role descriptions with licensure requirements and with the guidelines for the content of teacher preparation and continuing education.

5. Develop a financial plan for funding priorities and for fund raising.

Viability Testing

The "real-world" implementation of an educational KMS will occur through pilot programs in districts and states. The implementation will be informed by the examples of effectiveness from states that legislated SoR-related requirements and will align with EAC's long-term "Theory of Change"[21] (2024b).

Conclusion

Establishing a Knowledge Management System (KMS) for education is not merely an aspirational goal but an urgent necessity. Persistent inconsistencies in student outcomes, widespread mistrust in the education profession, and the patchwork of state-mandated policies reflect a system in dire need of reform. A centralized and trustworthy KMS must be managed collaboratively and built on evidence-based and research-based practices. Once realized, it can

[21] The long-term theory of change calls for "a coherent, integrated, and fully functioning U.S. educational system across all key components derived from scientific research and high-performing educators and education systems that have consistently produced strong achievement, and anchored by evidence-based licensure, accreditation, continuing education, and accountability."

provide a viable pathway toward professionalizing education and achieving systemic transformation.

Realizing this vision entails the creation of a robust Collaborative. This Collaborative would unite the aforementioned five leadership groups—educators, researchers, consumers, funders, and policymakers—ensuring that the diverse perspectives and expertise required to design and sustain a KMS are fully represented. Each leadership group in the Collaborative plays a pivotal role: educators and researchers will drive the development of a specialized knowledge base, funders will clarify and support scalable initiatives, and consumers and policymakers will advocate for and help shape the system's priorities. This Collaborative will be focused on developing a specialized knowledge base, designing educator preparation requirements, revising accreditation processes, and refining role descriptions for educators. In doing so, it will create a foundation for the education profession to effectively self-regulate.

The Collaborative's impact will reach beyond technical improvements to provide the organizational structure needed to align policy, practice, and accountability. By focusing initially on literacy, followed by behavioral wellness and mathematics, the Collaborative will ensure that the KMS addresses the most pressing challenges in education while providing a model for scalability and adaptability. The Collaborative's inclusive and strategic approach will ensure that the KMS moves beyond a theoretical construct into a dynamic, actionable system with widespread buy-in from stakeholders.

The stakes are high. Without a KMS, the education system will remain fragmented and ineffective, unable to meet the needs of educators or students. However, with the proposed Collaborative to develop the KMS, education can finally transition into a fully professionalized

field that not only improves teaching and learning outcomes but also restores trust and credibility. The Collaborative outlined in this paper provides a blueprint for the transformational change education so desperately needs. It is a call to action for policymakers, educators, researchers, and all stakeholders to commit to building a KMS that equips educators, empowers students, and secures the foundation of every other profession. By investing in this effort, the education system can become a beacon of trust and efficacy, leading to a brighter future for teachers, learners, and society as a whole

Currently, the U.S. education system is like a fast horse running on a sloppy track. The fast horse is the accumulation of evidence-based practices from the research community (formal research) and from the practice community (high-performing education systems at the state, district, and school levels). No matter how well trained the fast horse and how competent the jockey, they will show poor performance on a sloppy track and, at times, stumble and incur injury. A field of education that lacks a KMS and, therefore, does not self-regulate works like a sloppy track. Given how dire the educational crisis is, Rob Horner, the co-founder of the trustworthy evidence-based system PBIS[22] has asked: "What's the use of even more research if the research we have is not being put to good use?" EAC's response to Horner's question is that we must push forward. The race can be won, but only if we keep training the horse and jockey by conducting more research and testing it in diverse school settings while also 'cleaning up' the sloppy track by creating and implementing a KMS for the field of education.

[22] Funded by the U.S. Department of Education's Office of Special Education Programs (OSEP) and the Office of Elementary and Secondary Education (OESE), PBIS, or Positive Behavioral Interventions and Support, provides one of the most prominent examples of how an evidence-based system can scale up and sustain itself.

References

Antill, J. (2021, Nov. 18). A plumber or a handyperson? *Real KM.* https://realkm.com/2021/11/18/a-plumber-or-a-handyperson/

Barr, J. O. & Kauffman, T. L. (2014). Iatrogenesis in older adults. *A Comprehensive Guide to Geriatric Rehabilitation* (Third Edition). https://www.sciencedirect.com/book/9780702045882/a-comprehensive-guide-to-geriatric-rehabilitation

Boehning, A. P. & Haddad, L. M. (2023, July 17). Nursing Practice Act. *StatPearls.* https://www.ncbi.nlm.nih.gov/books/NBK559012/

Carnine, D. (2024a). The end game for the U.S. achievement crisis. Evidence Advocacy Center. https://evidenceadvocacycenter.org/wp-content/uploads/The-End-Game-for-the-Education-Crisis.pdf

Carnine, D., Lyon, R. (2024b). Envisioning an ethical and effective US education system. Evidence Advocacy Center. https://evidenceadvocacycenter.org/wp-content/uploads/Envisioning-an-Ethical-and-Effective-US-Education-System.pdf

Carnine, D. (2024c). The need for an educational evidence base: An overview of the Evidence Advocacy Center. Evidence Advocacy Center. https://evidenceadvocacycenter.org/wp-content/uploads/EAC-Overview.pdf

Carnine, D. (1992). Expanding the notion of teachers' rights: Access to tools that work. *Journal of Applied Behavior Analysis*, *25*(1), 13–19. https://doi.org/10.1901/jaba.1992.25-13

Council of Chief State School Officers. (n.d.). Science of reading legislation and implementation state scan. https://learning.ccsso.org/science-of-reading-legislation-and-implementation-state-scan

Document 360. (2024, August 29). What is the role of Knowledge Management System in finance. https://document360.com/blog/knowledge-management-in-finance/

Evidence Advocacy Center. (2024a). Advocate Advisory Panel's role in transforming the U.S. education system. https://evidenceadvocacycenter.org/wp-content/uploads/EAC-Advocate-Advisory-Panel.pdf

Evidence Advocacy Center. (2024b). Theory of change. https://evidenceadvocacycenter.org/wp-content/uploads/EAC-Theory-of-Change-6.20.24.pdf

Evidence Advocacy Center. (2024c). Report of state elementary teacher certification licensure and training in reading science. https://evidenceadvocacycenter.org/wp-content/uploads/State-teacher-certification-licensure-exam-project.pdf

ExcelinEd. (2024). Comprehensive early literacy policy. https://excelined.org/wp-content/uploads/2021/10/ExcelinEd_PolicyToolkit_EarlyLiteracy_StatebyStateAnalysis_2021.pdf

Hanford, E. (Host). (2022). *Sold a Story*. [Audio podcast]. APM Reports. https://features.apmreports.org/sold-a-story/

Institute for Education Sciences. (n.d.) What is 'evidence-based' as defined by the Every Student Success Act? https://ies.ed.gov/ncee/edlabs/infographics/pdf/REL_SE_What_is_Evidence-Based_as_Defined_by_ESSA.pdf

Lyon, G. R., Lloyd, J.W., Murray, M.S., Carnine, D. (2024). The Evidence Advocacy Center Guide to Evidence. The Evidence Advocacy Center. https://evidenceadvocacycenter.org/wp-content/uploads/EAC-Evidence-Guide.pdf

National Council on Teacher Quality. (2020). Teacher prep review: Clinical practice & classroom management. https://www.nctq.org/dmsView/NCTQ_2020_Teacher_Prep_Review_Clinical_Practice_and_Classroom_Management_Final_10_19

National Council on Teacher Quality. (2023). Teacher prep review: Reading foundations standard revision. https://www.nctq.org/pages/TPR-Standards-Revision-Reading

National Institute of Child Health and Human Development (NICHD) (2000). Report of the National Reading Panel. Teaching Children to Read: An Evidence-Based Assessment of the Scientific Research Literature on Reading and Its Implications for Reading Instruction (NIH Publication No. 00-4769). https://www.nichd.nih.gov/sites/default/files/publications/pubs/nrp/Documents/report.pdf

Pomerance, L. & Walsh, K. (2020). 2020 Teacher prep review: Clinical practice and classroom management. National Council on Teacher Quality. https://www.nctq.org/publications/2020-Teacher-Prep-Review:-Clinical-Practice-and-Classroom-Management

Ratcliffe, A. 4 healthcare regulations you need to know. Medtrainer. https://medtrainer.com/blog/4-healthcare-regulations-you-need-to-know/

Raymond, M. (2024, September 9). A lot has changed in the 40 years after "A Nation At Risk." But the school system? Not so much. *The 74*. https://www.the74million.org/article/a-lot-has-changed-in-the-40-years-after-a-nation-at-risk-but-the-school-system-not-so-much

Schwartz, S. (2022, July 20). Which states have passed 'Science of Reading' laws? What's in them? *Education Week*. https://www.edweek.org/teaching-learning/which-states-have-passed-science-of-reading-laws-whats-in-them/2022/07

Singal, A., Higgins, P., Waljee, A. (2014). A primer on effectiveness and efficacy trials. *Clinical and Translational Gastroenterology.* 5(1). https://journals.lww.com/ctg/abstract/2014/01000/a_primer_on_effectiveness_and_efficacy_trials.2.aspx

Stahnisch, F. W. & Verhoef, M. (2012) The Flexner Report of 1910 and its impact on complementary and alternative medicine and psychiatry in North America in the 20th century. *Evidence-Based Complementary and Alternative Medicine*, 2012(1). https://doi.org/10.1155/2012/647896

Tapper, A., & Millet, S. (2015). Revisiting the concept of a profession. *Research in Ethical Issues in Organizations*, 13, 1–18. https://www.researchgate.net/publication/283112028_Revisiting_the_Concept_of_a_Profession

U.S. Department of Justice. (2020, December 21). Justice Department announces global resolution of criminal and civil investigations with opioid manufacturer Purdue Pharma and civil settlement with members of the Sackler family. https://www.justice.gov/opa/pr/justice-department-announces-global-resolution-criminal-and-civil-investigations-opioid

Wennberg J. E., Wennberg D. E. (Eds.). (2000).The problem of unwanted variations. *Dartmouth atlas of healthcare in Michigan*. American Hospital Publishing. https://www.ncbi.nlm.nih.gov/books/NBK588038/