



**MAKING INFORMED DECISIONS ABOUT
PROGRAMS, POLICIES, PRACTICES, STRATEGIES,
INTERVENTIONS, ETC.**

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Appendices

- **Appendix A: Defining Evidence-Based Decision-Making**
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Making Informed Decisions about Programs, Policies, Practices, Strategies, Interventions, etc.

Educational leaders constantly face decisions about what to do to improve student motivation and learning. They need good information on which to base these decisions. So, how good is your information?

- What information do you use to identify needs (who is not achieving, not motivated, not responding to instruction, etc.)?
- How do you examine studies/research that inform strategies to address needs?
- How do you consider the relative effectiveness and merits of possible strategies in light of professional wisdom and contextual constraints?
- How do you evaluate and gather information on the implementation and outcomes that result from strategies/programs selected to implement?
- How do you decide what worked and didn't work?

Today's educators are particularly aware that they are expected to make data-based decisions in light of the heavy emphasis on student achievement data in state accountability programs. All are familiar with the idea of basing school improvement plans on the results of the prior years' student test results and monitoring trends in the data over time for increases and decreases. They are also aware of the need to ask for available research on the impact of programs they are considering, particularly Scientifically-Based Research (SBR) studies that compare an intervention's impact on students or teachers to a "business as usual" group. Finally, leaders have learned that most important plans of action should be evaluated to find out whether they worked as intended and how the plans of action could be improved.

One term that stresses the need to make more informed decisions is "evidence-based decision-making."

Evidence-based decision-making is a term that is being used across many professions which are trying to apply research and evaluation to their decision-making about clients.

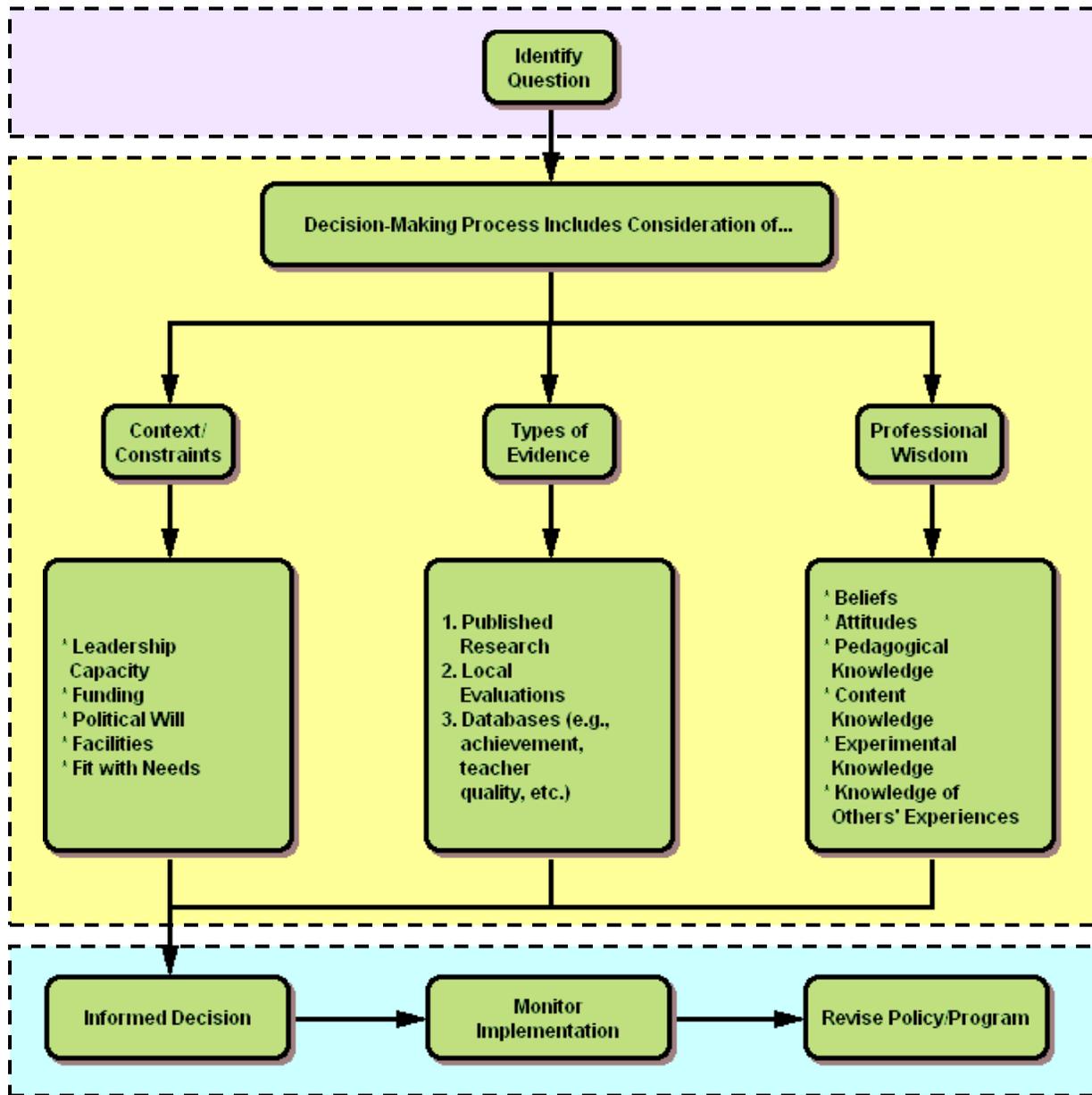
For example, the Oncology Nursing Society has produced "Evidence-Based Education Guidelines" for its members (who are practitioners) to use in presenting at meetings. The implication of the guidelines is that nurses should be able to articulate the "evidence base" for the nursing practices they recommend to others.

"Evidence-based practice (EBP) is based upon the belief that the use of the strongest available evidence in clinical decision-making contributes to quality patient care and a better outcome for patients."

Evidence-based practice means delivering services to students (clients) in ways that integrate the best available evidence with clinical expertise (i.e., professional wisdom gained from prior work with students) and content knowledge (what you learned in college and graduate level courses). In articulating desirable educational practices, this approach expects educators to be able to summarize the extent of the evidence base for their recommendations for action.

Defining Evidence-Based Decision-Making

The graphic below provides an overview of evidence-based decision-making. The terms included are described after the graphic.



Evidence-base: In making decisions about the need for, implementation, or impact of programs or practices that affect significant numbers of students, education leaders need an understanding of the evidence base for the programs or practices under consideration. In addition to seeking out high quality research studies on the effectiveness of the strategies under consideration to meet a particular need or problem area, effective leaders also continuously improve their programs through monitoring data and gathering evaluation information.

- 1) **Published research on intervention effectiveness:** Seeking out the best available research on a program or practice is a thread running throughout the No Child Left Behind legislation. The term used for such research about whether an intervention “works” (or is effective in achieving the outcomes desired with the target audience) is Scientifically-Based Research. The term means that educators should put a priority on trying to find out whether or not the interventions they consider have been shown to be effective through well-designed experimental studies.

In addition to finding out what research has been done in exploring the impacts of interventions under consideration, numbers 2 and 3 below (local evaluations and databases) are critical as strategies, programs, practices are planned and implemented.

- 2) **Local evaluations** to answer questions about implementation in your setting: As compared to “research” which implies studies conducted to expand the knowledge base relative to what works and other kinds of questions, “evaluation” implies information collected to directly assist particular decision-makers in their decision-making about what is working or not working in their particular classroom, school, district, etc. Even though a research study might show a particular intervention improved achievement significantly when compared to a control group that didn’t experience the intervention, implementation of that intervention in a different school setting might not get the same impact. Thus, it’s critical for leaders to collect evaluation information on implementation and outcomes when a new program, practice, intervention is implemented. Evaluation data should help to refine the features of the program to make it work better in a particular setting.
- 3) **Databases:** Monitoring trends in data over time is also critical to help educators clearly understand what is going on with a particular subgroup or program. More and more schools and districts have access to extensive national and state databases that allow them to create reports that answer particular questions about current conditions. This is another source of information that is considered part of evidence-based decision-making.

The **evidence base** (information gathered from research, evaluation, and data) needs to be understood by educators working to address a particular need for improvement. However, the evidence base is not the only input into decision-making. Information from research, evaluation, and data should be considered in light of the following:

Professional wisdom: This is the judgment that individuals acquire through experience (e.g., beliefs, attitudes, pedagogical knowledge, content knowledge, etc.). Increased professional wisdom is reflected in numerous ways, including the effective identification and incorporation of local circumstances into instruction.¹ Individual professional wisdom differs from collective professional wisdom in that a single teacher accumulates an individual experiential history that informs beliefs and actions but a collection of individuals (as in a faculty or a department) can also develop a common experiential history that guides their collective thinking about improvements needed.

Context/Constraints: The importance of considering context comes from the common finding that a change implemented in one school may not transfer well to all other schools. That is, context involves the interrelated conditions in which something exists or occurs—the current or historical setting (e.g., leadership capacity, politics, client needs, etc.). Context and interventions interact in ways that are sometimes predictable. For example, high quality principals or school leaders are considered an important pre-condition for the success of most complex school reforms.

The Director of the Institute of Education Sciences defines evidenced based decisions as the integration of professional wisdom with the best available empirical evidence in making decisions about how to deliver instruction.² In evidence-based education, decision makers consider empirical evidence in the context of practical constraints:

“Imagine that reading program A has been shown in several well designed studies to be somewhat more effective than reading program B. However, the cost of adopting and supporting A are higher than those for B. With both costs and effectiveness in mind, a district chooses B rather than A as its new reading program. That is a respectable evidence based [rational] decision.”³

¹ Whitehurst, G.J. (2002).

² Whitehurst, G. J. (October 2002). Evidence-Based Education (EBE): Presentation at the Student Achievement and School Accountability Conference.

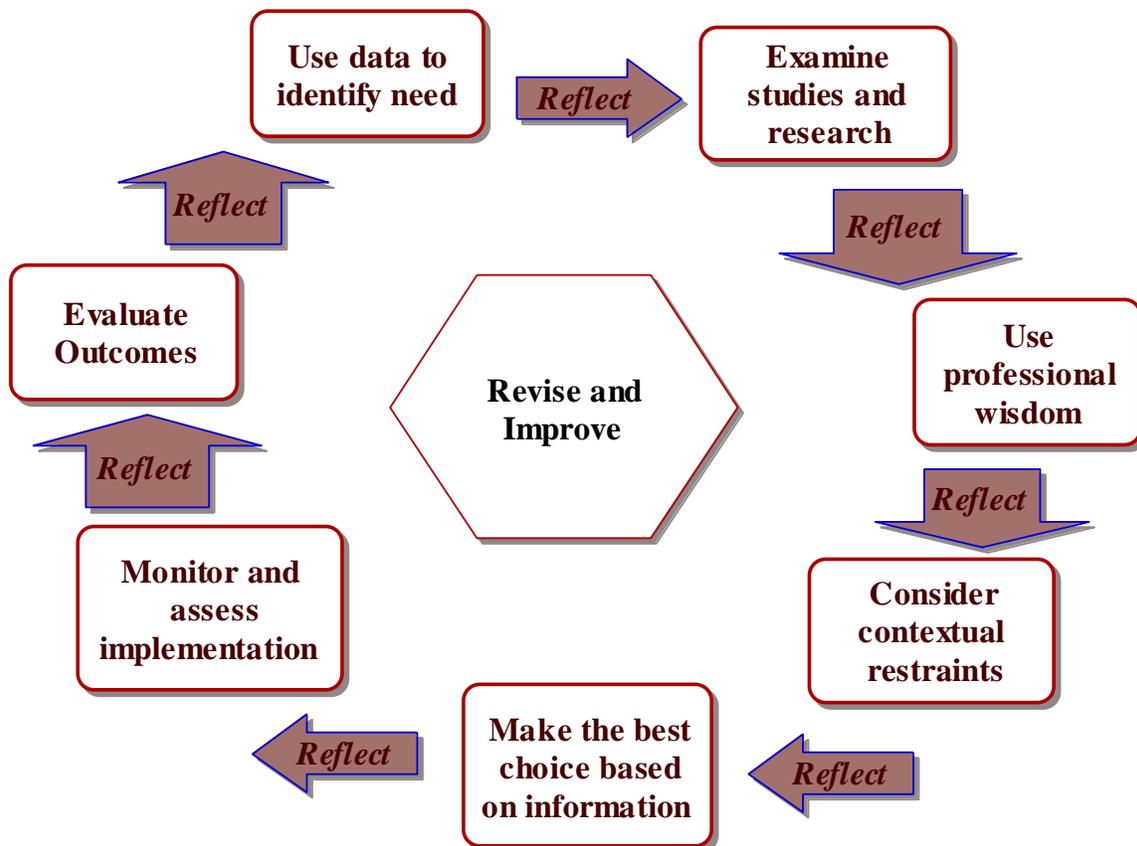
<http://www.ed.gov/nclb/methods/whatworks/eb/evidencebased.ppt>

³ Whitehurst, G.J. (2004).

Appendix A

One way of thinking about evidence-based decision-making is to visualize it as a cycle. The cycle helps in thinking about how the sources of information listed above relate to each other as part of a process in making an evidence-based decision. Each step in the cycle is considered separately, with revisions and improvements taking place continually throughout the cycle.

Evidence-Based Decision-Making Cycle



Use Data to Identify Need

Entering into the cycle of evidence-based decision-making, educators use data to identify the need or issue. In many cases, these data are student achievement data. For example, educators may examine math test scores and notice that students are performing particularly poorly on graphing and problem-solving skills. They may notice that students are scoring particularly poorly on their ability to write a persuasive paragraph. In other cases, educators may look at other data that alert them to problems such as dropout rates, suspension rates, or problems with attendance. In looking at the data, educators should define the problem as carefully as possible.

Examine Studies/Research on Approaches to Address Need

After the need has been identified, the next stage of the EBDM Cycle involves identifying interventions that address the need and reading the research behind the interventions. One kind of research that educators need to inform their thinking about the relative value of various programs, strategies, and interventions is Scientifically Based Research (SBR). According to SBR, to meet the requirements of *No Child Left Behind*, studies must compare an intervention's impact on students or teachers to that of a control group that didn't get the intervention. Such experimental studies of the effectiveness of interventions (with random assignment to the treatment and control groups) are costly and difficult to do, and often take several years to complete. Thus, it will take time for many of these studies to be completed and to trickle down to educators.

Use Professional Wisdom to Consider Effective Approaches

As educators examine studies, they may find some interventions that have been found to be effective in settings different from theirs. Alternately, they may find that there are no high quality studies on a specific topic. As a result, they have to consider the results they find from research and literature in light of their professional wisdom. Educators may ask themselves questions such as:

- Based on my experience, will this intervention work with my kids or my teachers?
- Is this intervention supported by what my experience tells me?
- When I have implemented similar interventions in the past, what has happened?

Incorporating professional wisdom into the EBDM Cycle recognizes and values the experiences that individuals have. Professional wisdom should not be used, however, in lieu of research as it provides a limited view necessarily restricted by individuals' experiences in specific environments and affected by biases.

Use Information to Make the Best Choice within Contextual Constraints

After investigating the research and informing the research with professional wisdom, educators must work within the reality of their setting. Questions that educators should consider as part of this process might be:

- What resources, particularly in terms of money and time, do I have?
- How will the staff/other individuals involved feel about this?
- What political constraints (school board, parents, community) might affect the decision?
- Are there ways that any of these constraints can be overcome or changed?

An evidence-based decision is the best possible choice within the constraints of the real world.

Monitor and Assess Implementation

Evidence-based decision-making is more than just looking for experimental research conducted on interventions. The absence of definitive findings from research and the limited number of studies conducted means that educators also need to use data and evaluations to help them understand what is working or not working as it is implemented in their states, districts, and schools. As a result, no matter what program, intervention or action is selected, the leader should adopt an experimental attitude and “evaluate” how well the action taken was implemented. It could be that the program was proven to work in a particular research setting but when teachers don’t have the level of support provided (as in the research study), it won’t work as well in your particular school. Any new program, policy, strategy, etc. that requires a significant investment of time or resources or that has potential impact on students should probably be piloted before it is used on a large scale. Evaluation is the collection of data that informs a decision-maker’s next steps in the particular local context. Evaluation is key to any planning process. This applies even at the level of the classroom in that a teacher’s lesson plans should have an “evaluation” component to them (e.g., at the end of the lesson, what is the current status of student learning and what needs to happen the next day as a result).

Evaluate Outcomes

Monitoring the implementation of a program provides key information about how the intervention needs to be adapted in a specific educational environment. The final question, however, is: Did we get the impact we wanted? As a result, the EBDM Cycle requires considering the outcomes of the decision. What actually happened as a result of implementing this program or policy? Did student achievement increase as we expected? Has teacher attendance improved? Did the dropout rates decline? Are parents spending

more time volunteering at school? Whatever the desired outcomes are, educators need to examine the results of their decision.

Because this is a cycle, evidence-based decision-making does not end with evaluating outcomes. Instead, it recognizes that evaluating outcomes gives data needed to make the next decision. If the intervention worked, do we have the outcomes we want now? How do we have to modify the program to increase its impact? If the program did not work, do we need to work on implementation, revise the program, or toss it and start anew? The EBDM Cycle never ends; it continues in a spiral-like way, providing educators with more and more information and increasing the quality of the decision-making over time.

Ongoing Reflection

Included throughout the EBDM Cycle is the need for ongoing reflection. This reflection allows educators to evaluate the process itself and determine how the process is meeting their needs or how it needs to be modified to better meet their needs.

Appendix B Further Reading on Evidence-Based Education

Definitions and Descriptions

Canadian Health Services Research Foundation. (March 11, 2004). *What counts? Interpreting evidence-based decision-making for management and policy*. Report of the 6th CHSRF Annual Invitational Workshop in Vancouver, British Columbia. Available from:

http://www.chsrf.ca/knowledge_transfer/pdf/2004_workshop_report_e.pdf

Defines “evidence” and “evidence-based decision-making” (EBDM), acknowledging that the definition of the former can be interpreted differently among various stakeholders; emphasizes that connecting the cultures of researchers and decision makers is perhaps the most critical element of the process, which, therefore, has a critical social element and requires constant dialogue; identifies and describes the four key characteristics of EBDM as transparency, reliability, inclusiveness, and explicitness.

Comings, J. P., Beder, H., Bingham, B., Reder, S., & Smith, C. (September 2003). *Establishing an evidence-based adult education system*. An “Occasional Paper” of the National Center for the Study of Adult Learning and Literacy, Harvard Graduate School of Education. Available from:

http://www.ncsall.net/fileadmin/resources/research/op_comings3.pdf

Describes the components of an evidence-based adult-education system; includes specific hypothetical examples to show how each of the five research methods—experimental, quasi-experimental, correlational with statistical controls, correlational without statistical controls, and case study—might answer a research question; describes and emphasizes the necessary collaborative relationship between researchers and practitioners.

EBE: Evidence-based Education. Durham, England: Curriculum, Evaluation, and Management Centre, Durham University. Available from:

<http://www.cemcentre.org/RenderPage.asp?LinkID=30310000>

Offers various links, including “Brief Guide,” a clear, concise definition of “evidence-based education” that also argues the case for its value, and “Research,” which contains resources for teachers and for researchers for conducting and interpreting experimental research.

Hammer, D.P., Sauer, K.A., Fielding, D.W & Skau, K.A. (April 8, 2004). White paper on best evidence pharmacy education (BEPE). *American Journal of Pharmaceutical Education*, 68(1), Article 24. Available from: <http://www.ajpe.org/aj6801/aj680124/aj680124.pdf>

Details the process of moving from “evidence” to “knowledge” and argues for the critical need not only to embrace, but also to “demand” the use of evidence in teaching, as well as in practice; uses numerous examples in pharmacy education and notes the similarities between that area and others, such as health care, economics, public policy, and education.

Evidence-based practice. National Early Childhood Technical Assistance Center. Available from: <http://www.nectac.org/topics/evbased/evbased.asp?text=1>

Provides a number of online resources “related to understanding what constitutes ‘evidence’ and how it is created”; gives links to evidence-based practices, all focused on helping build “a strong base of scientific evidence to inform educational policy and practice”; has both topic-specific and more-general resources.

Whitehurst, G.J. (April 26, 2004) *Making education evidence-based: Premises, principles, pragmatics, and politics*. Institute for Policy Research (Northwestern University) Distinguished Public Policy Lecture Series. Available from:

<http://www.northwestern.edu/ipr/events/lectures/DPPL-Whitehurst.pdf>

From the director of the Institute of Education Sciences, presents the U. S. Department of Education's position on evidence-based education: definition, premises and principles, value and utility, and challenges to advancing the transformation of the profession to a field defined by "scientific research and evaluation together with systematically collected data on education performance."

Resources: Using Data for Improvement

Bernhardt, V.L. (2004). *Data analysis for continuous school improvement* (2nd ed.). Larchmont, NY: Eye on Education, Inc.

Targeted to nonstatisticians, uses clear and concrete examples to show how to gather, analyze, and use data to improve all aspects of school performance; describes how to "replace hunches and hypotheses with facts, identify the root causes of problems, measure progress toward continuous school improvement, and effectively gather and use data to make better decisions"; targeted for K-12 schools and district levels.

Consortium for School Networking (CoSN). <http://3d2know.cosn.org/index.html>

"Data-driven Decision Making." Offers a range of information, materials, and tools related to the organization's 2003 "Data-driven Decision Making Initiative: Vision to Know and Do"; includes suggestions for collecting, understanding, and using data and practical ways for leaders to use data in decision making; provides a "nationally recognized framework for sharing knowledge among educators and transferring knowledge between the educational and vendor communities."

Data Use. <http://www.ncrel.org/datause/tools.php>

Provides links to tools and products that can assist in "collecting and analyzing different types of data" that are related to "various areas of need in schools and districts," including assessment and accountability, professional development, school and district climate, community partnerships, school and district leadership, and teacher quality.

Education for the Future. Download center. http://eff.csuchico.edu/download_center/

Along with links to "Book Downloads," provides links to a compilation of six articles by Victoria L. Bernhardt; covers a range of topics related to data: an analysis of why state-assessment results alone are insufficient in making effective data-driven decisions; strategies to help schools select an appropriate and effective data system; ways that databases can help with standards implementation; the intersection of multiple data variables to enrich data analyses; a summary of the relationship of data to school improvement; and more-effective methods of gathering, intersecting, and organizing different data categories.

Holcomb, E. L. (2004). *Getting excited about data: Combining people, passion, and proof to maximize student achievement* (2nd ed.). Thousand Oaks, CA: Corwin Press, Inc.,

“Demystifies the process of using data to guide decision making at the school level”; provides step-by-step guidance in gathering, documenting, and using data; includes a knowledge base emphasizing the role of data in effectiveness and successful change, group activities to assist in collaborative efforts, key questions that help identify sources of the proof of success, and information on utilizing data to establish priorities and integrate accountability requirements with data-based goals and school values.

Learning Point Associates. *Guide to using data in school improvement efforts*.

<http://www2/learningpt.org/catalog/item.asp?SessionID=353791269&productID=242>

Oriented toward educators “who are beginning to learn how to use data for school improvement”; offers information on “types of data, strategies for analyzing and understanding data, and methods for determining how these efforts can influence goals and planning.”

Mid-continent Research for Education and Learning (McREL).

“Assessment/Accountability/Data Use.” <http://www.mcrel.org/topics/topics.asp?topicsid=1>

Working on the premise that “effective schools learn how to get ‘hooked on data,’” provides links to services and products that can help “schools create a culture of data use through valid, standards-based classroom assessments and data-driven decision making”; includes research reports on, for example, (1) *How are Educators Using Data? A Comparative Analysis of Superintendent, Principal, and Teachers’ Perceptions of Accountability Systems*, (2) *Understanding How Principals Use Data in a New Environment of Accountability*, and (3) *Understanding How Superintendents Use Data in a New Environment of Accountability*; also includes tools and guides to assist in understanding and structuring related evaluation procedures and a standards-based assessment system.

The School Administrator. December 2002.

<http://www.aasa.org/publications/saissuedetail.cfm?ItemNumber=17828&snItemNumber=950&tnItemNumber=951>

Presents a complete issue of this American Association of School Administrator journal with the theme of “Data-driven Districts: Applying Statistical Proof to Multiple Purposes”; has five major articles, including “Knowledge-based Decision Making.”

Resources: Finding and Using High-quality Research

Institute of Education Sciences, U. S. Department of Education. *Identifying and Implementing Educational Practices Supported by Rigorous Evidence: A User Friendly Guide*. December 2003. <http://www.ed.gov/rschstat/research/pubs/rigorousetid/index.html>

Describes the characteristics and value of randomized control trials; delineates how to evaluate the rigor of interventions by “evidence of effectiveness” and what factors are important in the implementation of evidence-based interventions (EBI); includes an evaluation checklist and information on where to find EBI.

Lauer, Patricia A. *A Policymaker’s Primer on Education Research: How to Understand,*

Evaluate, and Use It. <http://www.ecs.org/html/educationIssues/Research/primer/foreword.asp>

Focuses on, for example, the state of research in education, connections between research and policy, and tools that can assist those who wish to incorporate research findings in policy decisions.

Margolin, Jonathan and Beth Buchler. *Critical Issue: Using Scientifically Based Research to Guide Educational Decisions*. <http://www.ncrel.org/sdrs/areas/issues/envrnmnt/go/go900.htm>
Serves as a basic primer on scientifically based research: No Child Left Behind (NCLB) definition, importance, relationship with the four NCLB Act titles, six criteria, examples, limitations/"pitfalls," and links to other resources; focuses on "how educators can use scientifically based research to inform teaching practices, curriculum decisions, and schoolwide programs."

Stanovich, Paula J. and Keith E. Stanovich. *Using Research and Reason in Education: How Teachers Can Use Scientifically Based Research to Make Curricular and Instructional Decisions*. <http://www.nifl.gov/partnershipforreading/publications/html/stanovich/>
Offers "a primer for those skills that will allow teachers to become independent evaluators of educational research"; provides key definitions, concepts, and explanations that can assist in "developing the skills to recognize scientifically based practice and, when the evidence is not available, use some basic research concepts to draw conclusions on their own."

Trybus, Margaret A. *The Challenge and Hope of Scientifically Based Research*. <http://www.ncrel.org/policy/pubs/html/vp11/essay.htm>
Outlines "the place of SBR in the No Child Left Behind Act"; explains the rationale and challenges for using SBR in making education decisions"; provides definitions and "outlines tools for translating research into practice."

Resources: Evaluating Programs, Policies, and Strategies

"Collaborative Evaluation Led by Local Educators: A Practical, Print- and Web-based Guide." <http://www.neirtec.org/evaluation/>
Presents the five evaluation stages with links to agendas, worksheets, and information briefs; also has the link to the complete guide, which "provides a framework and process for local educators to use for continuous data gathering, sharing of findings, and planning for improvement"; for educational-evaluation novices, has guiding questions, task checklists, and other Web-based resources, as well as a planning template and practical step-by-step "how-to's" for a range of evaluation tasks.

An Educator's Guide to Evaluating the Use of Technology in Schools and Classrooms. <http://www.ed.gov/pubs/EdTechGuide/index.html>

Intended for use at the district or school level, is structured around answering nine basic organizing questions: Why am I evaluating? What is an evaluation? Where do I start? What questions should I ask? What information should I collect? What's the best way to collect that information? What are my conclusions? How do I communicate my results? and Where do I go from here?; uses a sample school district to illustrate the overall evaluation process.

The Evaluation Exchange. <http://www.gse.harvard.edu/hfrp/eval.html>

As the quarterly evaluation periodical (free subscription) of the Harvard Family Research Project, "addresses current issues facing program evaluators of all levels . . . [d]esigned as an ongoing discussion among evaluators, program practitioners, funders, and policymakers . . .

highlights innovative methods and approaches to evaluation, emerging trends in evaluation practice, and practical applications of evaluation theory.”

Guskey, Thomas R. “The Age of Our Accountability: Evaluation Must Become an Integral Part of Staff Development.” *Journal of Staff Development* (vol.19, no. 4), fall 1998.

<http://www.nsd.org/library/publications/jsd/guskey194.cfm?printPage=1&>

Discusses his 5 levels of professional-development evaluation and 12 guidelines designed to improve evaluation quality; notes the planning, formative, and summative purposes of staff-development evaluation, emphasizing the necessity of finding whether development initiatives are of ultimate merit or worth by helping to answer 4 seminal questions: Is this program or activity leading to the intended results? Is it better than what was done previously? Is it better than another, competing activity? Is it worth the costs?

Journal of Staff Development, fall 2003. <http://www.nsd.org/library/publications/jsd/index.cfm>

Presents a complete issue of this National Staff Development Council journal with the theme of “evaluation”; topics range from, for example, the process for yielding useful data in focus groups to Joellen Killion’s eight steps in evaluating professional-learning-program quality, the latter drawn from “extensive practice and research in program evaluation.”

“Technology Project Evaluation.” <http://www.seirtec.org/evaluation/inst/worksheets.html>

Presents links to the SEIR*TEC “Formative Evaluation Framework, specifically intended to help local education agencies and individual schools increase their internal capacity to evaluate technology in teaching and learning situations”; also, however, “the strategies described in this framework may be easily adapted to the evaluation of other school-improvement projects as well”; answers such seminal questions as What is evaluation? Why is evaluation conducted (needs assessment, implementation, and impact)? When is evaluation conducted? How is evaluation different from assessment? and Is evaluation the same as research?

Caveats: Limitations and Pitfalls

Hammersley, Martyn. “Some Questions about Evidence-based Practice in Education.” Paper presented at the symposium on “Evidence-based Practice in Education” at the annual Conference of the British Educational Research Association; University of Leeds, England; September 13-15, 2001. <http://www.leeds.ac.uk/educol/documents/00001819.htm>

While agreeing that relevant research and evidence can improve professional practice, questions some of the key assumptions about the nature of both research and practice; the level of validity of research findings, especially compared with knowledge from professional experience; the futility of “transparent accountability”; and the “false hope of dramatic improvement in quality”; recommends “caution.”

Riehl, Carolyn. “Feeling Better: A Comparison of Medical Research and Educational Research.” In *Educational Researcher* (vol. 35, no. 5), June/July 2006.

<http://www.aera.net/publications/?id=1463>

Discusses the use of “randomized clinical trials in medical research, the role of evidence in medical practice, and the rhetorical strategies for conveying research information in medical journals”; observes and discusses that “physicians often participate in clinical research and . . .

function as knowledge workers,” but that although educators also engage in knowledge work, their practice “is not always regarded in that way”; cautions that even in medicine, “research in that field, and the efforts to make connections between research and practice, are works in progress.”