What Counts as Knowledge?
Concrete Examples of an Abstract Concept from the ACRL Framework for Information Literacy

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Introduction
In 2015, ACRL published the Framework for Information Literacy for Higher Education. This document describes six interconnected core concepts, or “frames,” which learners should understand about the relationships between information, research, and scholarship. In addition to the core concepts, the document describes knowledge practices and dispositions presented in a language appealing to multiple disciplines. These concepts are specific in their support for “flexible options for implementation rather than on a set of standards or learning outcomes or any prescriptive enumeration of skills.” The knowledge practices describe ways through which learners could demonstrate that they have mastered the knowledge inherent in each frame. The dispositions associated with each frame describe attitudes and preferences that would provide evidence that the learner has incorporated the values inherent in the frame into their own value system.

One of the six frames of information literacy is, “Authority is constructed and contextual.” The constructed and contextual nature of authority is perhaps the most abstract of all the frames in ACRL’s Framework. This concept acknowledges the inherent authority of expertise and credibility within a disciplinary community. This comes with a responsibility to respect skepticism, embrace new ideas, and recognize the contributions of diverse communities.

In academia, constructs of authoritative knowledge are based in disciplinary cultures, including our own culture of librarianship; in other words, what “counts” as knowledge in a discipline is shaped by, and part of, the unique culture of that discipline. If we understand that disciplines construct knowledge differently and understand what other disciplines value as knowledge, then we will be able to achieve more effective partnerships with our academic colleagues.

The foundation of any disciplinary authority is based on its epistemology: how that discipline defines what it knows and how it knows it. Epistemology is directly related to research in a discipline: the utilization and direction of research questions, underlying assumptions, methodology, types of data analysis, and conclusions drawn. This paper will explore ways of knowing and authority through the lens of evidence-based practice, an approach to decision-making in which the best available published evidence, professional expertise, and values of the client are considered. We will compare how the evidence-based practice paradigm defines what counts as knowledge in health sciences versus the field of education. We will then discuss results of a research project that investigated how librarians have negotiated the contested terrain of evidence-based practice in partnership with education faculty with whom they collaborate.

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Evidence-Based Practice in Medicine

Originating in the field of medicine, evidence-based practice (EBP) values knowledge derived from scientific experimentation, in particular, the randomized controlled trial. A randomized controlled trial (RCT) is an investigation in which participants are randomly assigned to two groups. One group receives the experimental intervention while the other control group receives a placebo or no intervention. Results from well-done RCT research studies can yield strong evidence that a cause and effect relationship exists between two variables. If multiple RCTs have been done on the same research question, then data from multiple studies can be pooled and analyzed in a systematic review, which tends to yield even stronger evidence than a single research study. This illustrates one of the main concepts of EBM: not all evidence is created equal. Some types of research studies provide stronger evidence and can therefore better support decision making towards a particular course of action. This principle is illustrated in the hierarchy of evidence pyramid shown in Figure 1. The pyramid arranges different study designs from the lowest level of evidence to the highest. Study designs at the lower levels provide weak evidence that a relationship between two variables exists. Expert opinion represents the weakest form of evidence in the EBP paradigm.

The principles of EBP are embedded in the information tools that health professionals use every day (e.g. Dynamed™ and Nursing Reference Center™). For example, Dynamed is a database used by physicians that is designed for information retrieval at the point of care or bedside and provides peer-reviewed summaries detailing the strongest evidence for thousands of diseases and conditions. Figure 2 shows a screenshot of the Dynamed report for Otitis Media (ear infection) listing treatment recommendations with associated levels of evidence. Dynamed rates the evidence as Level 1, 2, or 3; Level 1 evidence, the highest level, describes a recommendation that is based on research studies that meet certain quality standards such as randomization of groups, sufficient sample size, and blinding of participants and researchers.
Due to its genesis in the field of medicine, EBP is based on a scientific model that is quantitative in nature. In the EBP paradigm, research questions are well-defined and studies should be replicable. Outcomes in many medical research studies usually lend themselves well to precise measurement such as morbidity and mortality rates. Furthermore, research in medicine tends to be well-funded by government and industry—true for some research questions and study populations more than others—making possible large-scale high quality randomized controlled trials resulting in higher levels of evidence.

Evidence-Based Practices in Education

The term “evidence-based” is used extensively in education. As of January 31, 2017, an ERIC search for the phrase evidence-based practices results in 7,469 peer-reviewed articles published over the past 20 years. Educational research which is indexed in the ERIC database is of international interest and is related to many different domains such as teaching methods, educational practices, program effectiveness, theory-practice relationships, educational change, models, program implementation, instructional effectiveness, and evaluation methods, among others. Over time, research methods in education have evolved in response to a changing sociocultural, political, and ethical environment. These changes have challenged assumptions about knowledge and the validity of drawing an analogy between the research paradigms in medical and educational research. While qualitative research methods have yet to achieve full acceptance in health sciences research, qualitative research methods have been added to the accepted quantitative research agenda in education. Qualitative data is collected through direct observation and interviews and explores the lived experiences of the participants. Reflective practice, action research, and case studies have been used to study several aspects of education. Qualitative researchers adopted a stance of full partnership in pursuing answers to research questions in the social sciences such as education. Their goal was to answer research...
questions that could not be explored quantitatively; to pursue a holistic, inductive approach rather than a deductive, a priori position focused on measurable, well-defined variables. For example, research questions involving teaching methods associated with higher levels of knowledge retention lend themselves to a more quantitative type of methodology for data collection and analysis, while research questions investigating how individuals who are new to a community learn about that community’s culture and practices might lend themselves to more qualitative methods.

This historical evolution of educational research was the focus of a recent special issue of the primary journal of the American Educational Research Association (AERA) which included reflections on addresses of the AERAs past presidents as delivered at association conferences during the previous hundred years. The addresses contained clues about educational research over the time period. The issue editors noted that the presidential addresses showed evidence of “…how the shortcomings of early research on testing adversely affected students’ learning opportunities and how AERA president’s faith in the power of research to improve practice has persisted even as that research has been contested and failed to meet its producers’ high hopes.” The editors note that the increasing diversity of members of the educational research field has led to an expansion of the methods and theoretical foundations used in the field.

In summary, approaches to educational research are varied and educational researchers do not argue that one research approach or position is better than another. The methodology selected to investigate a research question depends on the question itself, the research context, the resources available, and epistemological considerations related to the question, “How do I know what I know?” As a result, no education research methodology transcends all learning or teaching experiences. The randomized controlled trial that is prioritized in medical research is not appropriate for all educational research questions and contexts, and is furthermore often not practically achievable. Therefore, while EBP is valued in education, its application according to the medical model described previously can be problematic. Nevertheless, demands for accountability in education that arose in the past several decades have led to increasing demands for the application of EBP to education.

Evidence-Based Practice in Educational Law

Originally enacted in 1975, the Individuals with Disabilities Education Act required the use of evidence-based practices in the design, implementation, and evaluation of special education programs.12 In 2002, the concept of EBP became the bedrock of the No Child Left Behind (NCLB) legislation.13 This legislation was an attempt to increase accountability in schools by supporting federal and state mandated standards-based education. The language of the legislation did not include the term, “evidence-based,” but it specified that educational interventions in reading and mathematics be based upon “rigorous, systematic, and objective procedures” that, ideally, were published in peer-reviewed journals or were otherwise “scientifically” validated. While a plethora of published research studies regarding reading and mathematics educational interventions were available, the successful implementation of these interventions in a “one size fits all” approach to vastly diverse student populations was a challenge. The formula used to evaluate individual schools’ implementation of interventions supported by research did not take into account variables such as geographic location, resources, and funding. The end result was a law that hindered rather than enhanced student development.

The NCLB was replaced by the Every Student Succeeds Act of 2015 (ESSA).14 The newer legislation now uses the phrase, “evidence-based practice” and includes a recommended hierarchy of research designs from stronger evidence to weaker levels of evidence as shown in Figure 3.15
Notice similarities between the levels of evidence as applied to educational research and the evidence pyramid that we included earlier in the discussion about EBP in medicine. As in medicine, all evidence is not created equal and certain types of study designs are more likely to provide evidence of a relationship between two variables. In addition, the larger the sample size, the greater the ability to show a statistically significant effect size for the intervention.

While the NCLB was seen as inflexible, the ESSA is seen as a more balanced approach to educational goals and outcomes. Commentators have remarked on the increased flexibility the ESSA offers for deciding which evidence-based initiatives will work with their students. Notably, the ESSA allows for educational interventions to be based on “convincing rationale” rather than insisting upon the sole use of interventions that have been investigated in previously published studies. This acknowledges that studies may not be available to support some educational interventions that might be applied in a classroom. The changes in the laws reflect a more expansive view of evidence over time.

In summary, evidence-based practice is a paradigm that prioritizes certain types of knowledge—that which can be measured with well-defined outcomes and variables in randomized controlled trials. While this paradigm had its genesis in the biomedical model—and therefore aligns with the research questions and goals of biomedicine—challenges or tensions can arise in the application of evidence-based practice in the field of education. As researchers, we wondered whether academic librarians who worked with education faculty might encounter this tension.

**Professional Collaborations in Teaching EBP**

Over a period of two years we studied the relationship between academic librarians and education faculty as they collaborated to teach EBP skills to education students. We were interested in finding librarians who were knowledgeable about the EBP paradigm and sought to teach students a range of skills including the ability to formulate an “answerable” question (usually in a specific, defined format known as the “PICO question” that is
most amenable to research questions that compare the effects of different treatment interventions on a group of
subjects or participants\textsuperscript{17}; literature searching skills for locating evidence, and the ability to identify high-quality
research studies representing strong evidence. In our research we collected qualitative data by interviewing four
pairs of education faculty and librarians to find out how these collaborations were initiated, what outcomes were
achieved, and to identify challenges or barriers to the collaborations\textsuperscript{18}. 

One outcome of our research was the identification of epistemological tensions that occurred when the
EBP construct was integrated into the education curriculum. The librarians and education faculty negotiated
the construct of EBP in their collaborations. Because they had intimate knowledge of educational research
theory and methods, the educators that we interviewed were well aware of the challenges in applying the
EBP construct to all educational research questions and to education practice. We discovered that all of the
librarians encountered this tension although some had a more sophisticated awareness of it than others. For
example, one librarian was excited to teach education students about how to formulate research questions
using the PICO method, which best applies to “cause and effect” research questions such as those investigat-
ing outcomes from an intervention of interest. She was surprised to find that the PICO method did not work
as well for formulating other types of research questions. Another librarian who was more sophisticated in
her knowledge of EBP due to her experience as a medical librarian was surprised to discover that the level
of education research was not as robust as medicine. She was somewhat dismayed to find that the methods
she used to evaluate the quality of medical research studies did not quite apply to all of the educational re-
search studies that she encountered. This librarian worked with one faculty member who was skeptical about
the application of EBP in education. However, the librarian saw similarities between EBP and information
literacy skills and was able to use those similarities to initiate teaching collaborations with other education
faculty colleagues. Finally, another librarian with previous K-12 teaching experience used the phrase “poli-
tics of evidence” when describing the application of EBP in education. He recognized that the answer to the
question, “What counts as knowledge?” is political in nature, which hearkens back to the frame, “Authority
is constructed and contextual.” This librarian in particular went far beyond traditional librarian/teaching
faculty boundaries and was a full partner in curriculum design, planning, and teaching with his education
faculty counterpart.

In our interviews with education faculty, we found evidence of conflicts arising from the legislative man-
dates of IDEA and NCLB that required K-12 educational interventions to be supported by rigorous research.
Education faculty were deeply concerned with the requirement for rigorous scientific research as the only ac-
ceptable evidence for decision making. Several participants challenged the hegemony of EBP based on their
concerns regarding practical and ethical constraints. A faculty member in special education remarked that it
would be impossible to initiate some studies because one could not ethically limit treatment to one group of
students versus giving it to another. Another faculty member described the practical difficulties that educa-
tional researchers experience in establishing large samples of research participants that can be divided into
treatment and control groups that are statistically similar in baseline characteristics, especially in the K-12
population.

Librarians with a more sophisticated understanding of the tensions in applying EBP to education were able
to transcend traditional professional roles and boundaries in favor of true, mutually negotiated curricular col-
laboration. We concluded that effective collaborations between librarians and education faculty must include an
active attempt to understand the discipline’s epistemology, or “what counts as knowledge” in the field. This un-
derstanding is a result of mutual respect and the establishment of an active, ongoing dialogue which is difficult
to achieve in the “one-shot” instruction sessions that can often be the norm in academic librarianship.
Conclusion
The ACRL framework of “Authority is constructed and contextual” transcends disciplinary cultures. Our approach in this paper was to examine a particular construct, evidence-based practice. Initially conceptualized in the field of medicine, it was adopted and applied in education and is currently utilized in decision making in medicine and education as well as other professions. Understanding how evidence-based practice has been applied and received in each profession helps to illustrate differences among communities of practice in “what counts as knowledge.”

We began our discussion with a definition of EBP in medicine and briefly traced its application in legal mandates in education. In this one can see the practical implications of applying a framework for “what counts as knowledge” in medicine to the context of educational practice. Our research about the collaboration between librarians and research faculty to teach EBP skills uncovered another critical element that validates the constructed and contextual nature of authority. When the participants committed to understanding the disciplinary differences in how knowledge was constructed and valued they were able to achieve more effective partnerships. The key to understanding was active dialog that extended over weeks, months, and years. We conclude with a series of questions that we hope will help you initiate your dialog with your partners in collaboration, present and future: What do we as academic librarians value as knowledge? How does our epistemology affect decision-making and partnerships? How might our conceptions of “what counts as knowledge” differ from other academic cultures’ conceptions? How can we learn about the epistemologies, authority, and context of other academic cultures?

Notes
2. Ibid.
3. Ibid.
6. Ibid.