Strategies for Educational Inquiry

Introduction to Research

What are Strategies for Educational Inquiry?

This introduction provides an overview of three topics:

- What is Inquiry?
- Inquiry and the Scientific Method
- Research Context
- Evidence Based Research

What is Inquiry?

A dictionary definition of “inquiry” is “search for truth.” The definitions for, and examples of, “inquiry” contained in the *Oxford English Dictionary* are instructive. The concepts of truth, evidence, and objectivity are discussed endlessly by philosophers and even though we will not examine such discussions in detail, these concepts will be our constant companions during this course — and throughout the reminder of your life, for the very ideas of truth, evidence, and objectivity are the foundation of research, and research is a very large part of the foundation on which the achievements of Western Civilization rest. We will use “inquiry” as a synonym for “research,” which is both a process (methods) and a product (knowledge).

In recent decades these concepts were under intense assault by adherents of certain philosophical positions, and that assault continues today. The next two paragraphs from Zaman points to the implications of these ideas:

Science philosopher Mario Bunge believes that ‘Over the last three decades or so very many universities have been infiltrated, though not yet seized, by the enemies of learning, rigor, and empirical evidence: those who proclaim that there is no objective truth, whence “anything goes,” those who pass off political opinion as science and engage in bogus scholarship. These are not unorthodox original thinkers; they ignore or even scorn rigorous thinking and experimenting altogether. Nor are they misunderstood Galileos punished by the powers that be for proposing daring new truths or methods...They have mounted a Trojan horse inside the academic citadel with the intention of destroying higher culture from within.’

1. [http://calliope.ucs.indiana.edu/oed/](http://calliope.ucs.indiana.edu/oed/)
And who are the enemies of science and academic learning of which he speaks? Bunge (paraphrased) continues—The academic enemies of the very raison d’être of the university can be grouped into two bands: the antiscientists, who often call themselves ‘postmodernists,’ who teach that there are no objective and universal truths; and ‘pseudoscientists’ that in the name of academic freedom ‘smuggle in’ fuzzy concepts, wild conjectures, or even ideology as scientific findings (Bunge, 1996:96-97).³

Individuals who question the existence of truth, evidence, and objectivity do write and publish manuscripts that purport to be research articles about topics of interest to educators. In fact, Griffiths⁴ and Gitlin⁵ among others, have published books that adhere to postmodernism and/or critical theory and yet purport to be guides for conducting educational “research.” However, the political agenda cannot but be noticed.

The relationships between these philosophical ideas and research methods may not be clear to you at this time. The term “ontology” refers to one’s perception of reality (i.e., one’s worldview). One’s ontology determines one’s view of epistemology (i.e., How is it we know whatever it is we think we know?), and epistemology leads to one’s choice of research methods.

Individuals who adhere to a traditional view of truth and knowledge, will make certain assumptions about “how we know”; about what constitutes justified, true belief; and hence, about the research methods that one must use in order to establish knowledge claims as justified, true beliefs.

Individuals who adhere to “postmodern” views (or critical theory) hold a quite different view of reality and hence of epistemology, and thus of “research” methods. One important question for you to consider is whether truth, research, knowledge, and even learning itself, can exist if one adheres to the ontology of postmodernism and/or critical theory.

One of the more provocative events in this exchange of ideas was a piece written by Alan Sokal, a physicist, and published in Social Text, an academic journal of cultural studies. Sokal claimed that deep similarities existed between quantum gravitational theory and postmodern thinking. The article was hailed as a grand piece by postmodern adherents. Later, Sokal announced that his piece was actually a parody, “a catalog of nonsense written in erudite but impenetrable lingo.”⁶ You can read Sokal’s piece and reactions on his web site.⁷

Hopefully, at the end of this course you will possess skills that enable you to analyze articles published in scholarly journals and judge the extent to which a particular article adheres to time-tested standards of research. Pryor’s suggestions on how to read a philosophy article may be helpful for evaluating the propositions in an empirical research article.⁸


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Historical Background

The first secular academics to struggle with and write about issues such as truth and evidence were philosophers. Much can be learned about the nature of knowledge and the act of inquiry by studying what they have written. Those of you who are interested may look at the following web sites:

- **Timeline of Western Philosophy**

Everyone should look at the following sites which feature images and little text:

- **Ancient Philosophy**
- **Medieval Philosophy**
- **Modern Philosophy**

Academic Psychology & Educational Research

One pathway from philosophers to the methods used in educational research is through psychology. Some of the early psychologists characterized their endeavors as "experimental philosophy" because these psychologists were attempting to use empirical methods to inquire about philosophical questions, rather than merely sitting in an overstuffed chair, puffing a pipe, stroking one’s beard, and just thinking.

At least two branches of the social sciences (psychology and sociology) have produced substantial bodies of work dealing with questions that in previous decades were nearly the exclusive province of philosophers. Today many universities offer courses with titles such as “Psychology and the Philosophy of Science.” The material that is covered in such courses is pertinent to us as we read research articles and think about their quality. Unfortunately, time does not permit us to delve deeply into the philosophical questions. One set of lecture notes (“What is Inquiry?”) deals with inquiry as a philosopher views it and you should look at the web resources mentioned above, particularly the three links labeled ancient, medieval, and modern philosophy. These contain brief sketches of the history of these ideas.

Schulman (1997) (one of the required readings) points out that education is a “an interest area.” He means that education is a fruitful area of research for investigators from academic disciplines such as psychology, sociology, and anthropology. Researchers from these disciplines have applied their investigative methods to education and it should not be surprising that the philosophical questions underlying these differing methods are now discussed with some frequency in education journals.

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We should also note that each of these three academic disciplines developed, and hence bring to the study of education, different research methods. For example, the concept of “learning” has been of central importance to psychologists since the discipline’s inception. By the 1890s, and perhaps earlier, psychologists became interested in education. One branch of psychology became so closely identified with educational concerns that we refer to this distinct branch as “educational psychology.” Identifying and understanding the differences among individuals in cognitive performance motivated much of the research in this area and led to the development of theory and methods of measurement. Meanwhile, other psychologists continued the study of learning, using animals as their subjects, and experimental designs. These psychologists developed highly refined theories of learning, modeled after the design of theories in physics. Psychologists viewed physics as the most mature of the sciences and sought to emulate the manner in which theory developed in physics.

In the grand scheme, physics was viewed as the most elemental of sciences, meaning that the theories and laws of all other sciences were ultimately reducible to physics. That is, at some point in the future, the theories, laws, and postulates found in chemistry would be reduced to physics. Likewise, the theories and laws of biology would be reducible to chemistry; the theories and laws of psychology to biology; the theories and laws of sociology to psychology; the theories of anthropology to sociology.

Sociology & Anthropology

Sociologists, too, study education but usually their interest is in how social and/or economic classes differ either in access to educational institutions or in the global performance of groups of individuals. If you look at a time line of sociology you will have a better appreciation of their interests. The research methods that sociologist contribute to the study of education consist of survey techniques, the methods used by demography, as well as the ethnographic methods that we associate with, for example, Margaret Mead’s *Coming of Age in Samoa*. The field of anthropology also claims Margaret Mead and the inquiry methods reported in that book. (Note that just as the propositions contained in some quantitative research reports are not replicated by other investigators, the picture of Samoan society was as depicted by Margaret Mead (relaxed, sexually free, egalitarian, and permissive) is disputed by other investigators. For example, Derek Freeman depicts it as puritanical, authoritarian, unequal, and punitive).

The research methods developed in anthropology are used by some investigators to study some aspect of education. For example, the researcher may go to a school and observe the individuals and events (aka, the culture of the school) for an extended period of time. The researcher makes extensive notes while on site and later, away from the site, may elaborate on the notes and add the researcher’s own reactions and speculation. The researcher may make audio and/or video recordings for later study. The theoretical vies that guide the anthropologist differ somewhat from the views that guide the psychologist and we will compare and contrast these differing perspectives as the course unfolds.

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Inquiry and the Scientific Method

The definition of inquiry, which we will treat as a synonym for “research,” that guides us throughout
the remainder of the course is found in Haack\(^{18}\) (1996): Inquiry is the search for truth. In addition to
reading Haack, be sure to read Bailey (2001)\(^ {19}\) and Schafersman (1994).\(^ {20}\)

Although time limitations restrict what we can discuss in this course, it is worth noting that other
legitimate ways of knowing do exist, including **authority, tradition, expert opinion, and personal
experience**. These other approaches may be appropriate depending on the task at hand. For example,
personal experience with many different individuals and life events is indispensable for the novel-
list. However, the novelist does not explain **publicly** the manner in which these “data” were
collected (maybe years of writing reflections in journals), how they were “analyzed” (perhaps based
on persistence of feelings), nor how the “results” are presented (description of the novelist’s writing
style). Consider the difficulty that even Shakespeare might have in attempting to describe — in a
public manner that could be replicated by other playwrights — how he made observations, “ana-
lyzed” the essence of the observations and distilled them into plays. How could he describe in a pub-
lic manner his incomparable use of language? No one would argue that his work is not an important
contribution to Western Civilization, but nonetheless, such works lack public access to methods. We
do not disparage these approaches; rather, they just are not the focus of this course nor do such meth-
ods qualify as research.

Turning our attention to research, we note that the investigation of substantive, educational topics is
not limited to any single research method. Instead, the choice of method depends upon the
researcher’s goal (to **describe** a fuzzy phenomenon, to **identify a relationship**, or to propose a
**causal relationship**) and constraints such as time, money, and the effort required to collect data.
Nonetheless, all research methods are based on a few common principles. Traditionally, these prin-
ciples, taken together, are referred to as the “scientific method” and, by Shulman, as “disciplined
inquiry.” After distinguishing between primary and secondary research, the three principles we will
emphasize are:
- Empiricism,
- Rationalism, and
- Skepticism.

**Primary vs. secondary research.** Research reports can be divided into “primary” and “secondary.”
The latter term refers to review articles (or meta-analytic articles) in which the author reads and syn-
thesizes many primary articles and offers an opinion about the state of knowledge concerning a par-
ticular phenomenon, such as the relationship between religion and health. The term “primary” is
reserved for those articles in which the author(s) clearly and unquestionably gather and analyze the
data themselves.

**Empiricism.** The first hand collection of data is a distinguishing characteristic of primary research
studies. The investigators may interview individuals, observe teacher behavior in a classroom, exam-
ine video tape of televised shows, inspect a collection of journal entries, categorize the content of
photographs, administer a personality instrument or an achievement test, or look for patterns of per-
sistence in teachers or student data originally collected for administrative purposes. In all instances

\(^{18}\) http://www.indiana.edu/~educy520/readings/haack96truth.pdf
\(^{19}\) http://www.indiana.edu/~educy520/readings/bailey2001truth.pdf
\(^{20}\) http://www.indiana.edu/~educy520/readings/schafersman94.pdf
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the investigators deal with data that is detectable by one’s senses. Empirical data is critical for research, for its existence enables other researchers to examine the same data and to replicate the original investigators’ findings. Publicly accessible methods, clearly described, are closely associated with the idea of empiricism.

Good primary research is characterized by empirical data, public methods of data collection and analysis, and clearly written descriptions. This combination of data, methods, and writing enable findings to be replicated by others. Replication of findings by different researchers who have differing objectives and theoretical perspectives is an attribute that distinguishes the scientific method from other approaches.

Rationalism. A second characteristic of good primary research articles is careful, analytical, logical reasoning. Individuals usually do not reason logically without deliberate study and practice. Instead, we humans seem, spontaneously, to want to believe a knowledge claim because we feel it is true or simply wish it were true. It is a struggle for many of us to realize that emotions and feelings are not evidence. Although we do not study logic formally in this course, you will need to reason logically in order to critique research articles and to understand the principles of inference making. We will distinguish between deductive and inductive reasoning. You are encouraged to explore the following:

- Logical Reasoning
- Fallacies
- Fallacies
- Examples from GRE

Skepticism. Schafersman (1994) notes that the most important aspect of skepticism is “the constant questioning of your beliefs and conclusions.... Self-deception often goes unrecognized because most people deceive themselves.” The way to become aware of self-deception is to “repeatedly and rigorously examine your basis for holding your beliefs. You must question the truth and reliability of both the knowledge claims of others and the knowledge you already possess.” Gilovich presents interesting examples and cite much of the relevant research. He notes:

We are predisposed to see order, pattern, and meaning in the world, and we find randomness, chaos, and meaninglessness unsatisfying. Human nature abhors a lack of predictability and the absence of meaning. As a consequence, we tend to “see” order where there is none, and we spot meaningful patterns where only the vagaries of chance are operating.

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The Research Context

Are researchers, in general, pleased with the quality of empirically-based research reports that appear in academic journals? I do not know the answer for researchers in general, but a not insignificant segment of the researchers in the various academic disciplines have voiced their concern about research quality. The lecture notes contain several statements from educational researchers who lament the quality of published articles. You should not, however, conclude that education research is any worse than research performed by psychologists and sociologists on other topics. If we had unlimited time we could visit the literature of both disciplines and ferret out equally critical comments about the quality of research in those disciplines. The point you should note is that no substitute exists for learning what constitutes a good piece of research and the carefully reading of each piece by you.

Evidence-Based Research

The “Education Sciences Reform Act of 2002” established a new organization, within the Department of Education, to manage the half a billion dollars of grant money that the department awards annually, and to transform education research into an evidence-based field. According to the director, this means:

First, the rigor of education research will have to be enhanced. Far too much education research is based on methodologies that cannot support the questions that are addressed or the conclusions that are drawn. Over the past decade, 38 percent of the primary research reports in the American Education Research Association’s two premier journals involved qualitative methods, the results of which were often used to support causal conclusions. Qualitative and interpretative methods have their place in the array of methodologies that can be deployed in sophisticated programs of education research, but they do not answer the practical issues of program efficacy that are critical for most practitioners.

A similar problem exists within the quantitative realm, in which correlational analyses are frequently used to argue for or against educational policies. The telling practical problem is that correlational datasets permit multiple forms of analysis and differing policy conclusions. . . . The shifting sands of correlational and qualitative analyses cannot be the principle elements in the foundation of empirically driven educational policy. For that we will need randomized trials and experimental methods, which are currently rare. 26

You may be interested in examining some of the arguments that have been put forth in an attempt to develop a method to justify causal propositions with qualitative methods. 27

Let us turn now the definition of research from No Child Left Behind. 28 While this definition is more detailed than that in the Whitehurst piece, it too emphasizes rigor, random assignment, and scientific

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methods. The following points, all reported in *Education Week*, chronicle the debate about scientific research methods, research quality, and qualitative methods and causal statements:

- What is (and isn’t) research
- Definitions of “research” raises concerns
- Panel to define scientific rigor in schools research
- Law mandates scientific base for research
- Lawmaker wages lonely crusade to improve studies

Finally, consider the following, more detailed explications of evidence-based research that appeared in *Education Next*, the handbook from the Coalition for Evidence-Based Policy, and chapter 5 of *Scientific Research in Education*.

- Sciencephobia
- Rigorous Evidence handbook
- Designs for the Conduct of Scientific Research in Education

   the unabridged version with references:
   http://www.educationnext.org/unabridged/20013/cook.html
   also available here:
   http://www.indiana.edu/~educy520/sec6432/week_02/User-Friendly_Guide_12.2.03.pdf