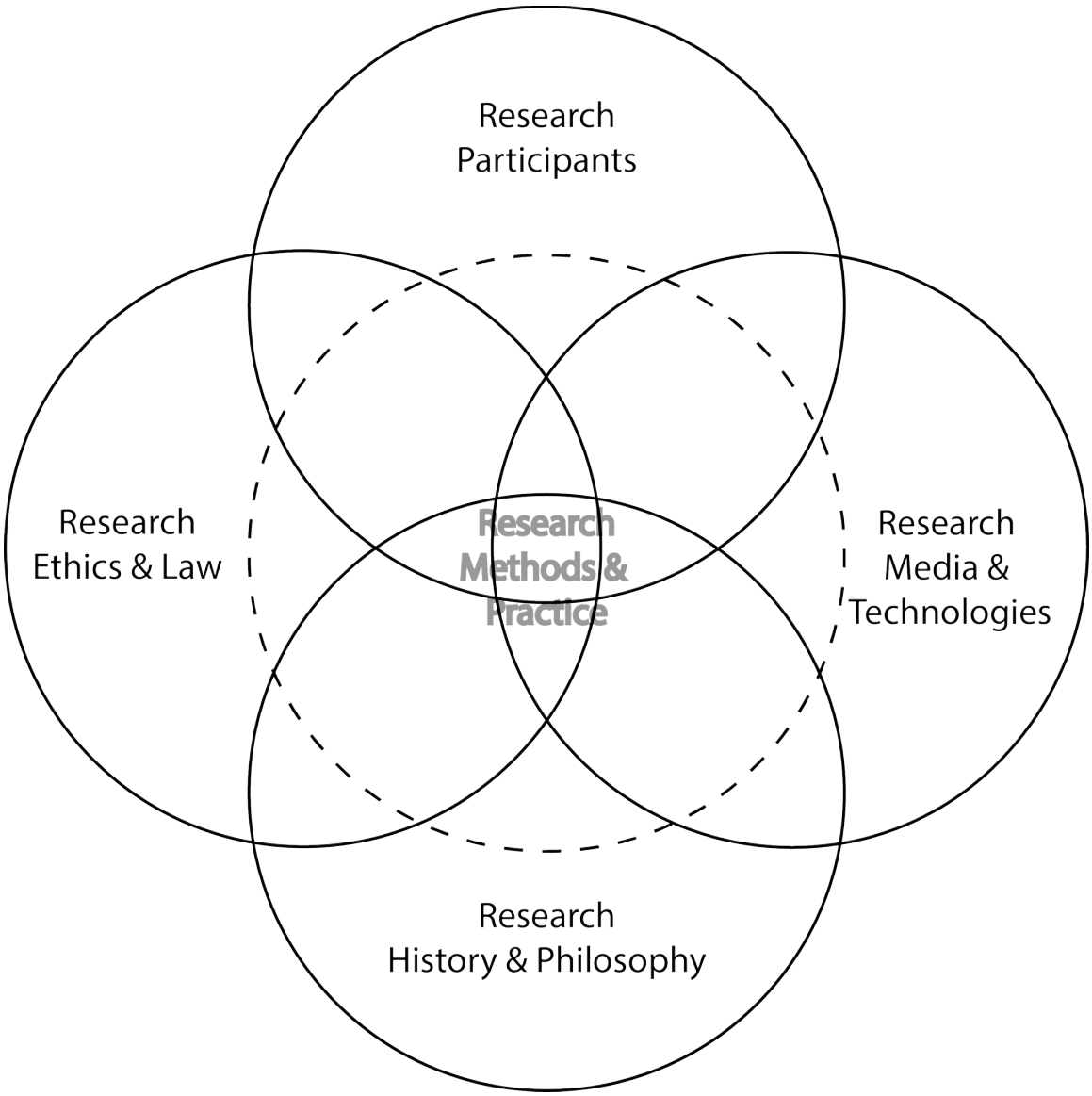
a place of mind

THE UNIVERSITY OF BRITISH COLUMBIA

EDUC 500: Research Methodology in Education

Lecture Notes

S. Petrina (5 July 2014)



Etymology, History and Philosophy of Research

1. **Etymology and Semantics**
    a. Etymology
        i. **Research**: Etymologically, research derives from the Italian *ricercare* and French *recherche*, meaning to seek out or to search intensively with particular thoroughness. The English "research," meaning to study closely, question, or search out, is first attested in the late sixteenth and early seventeenth centuries. The association of "inquiry" and "investigation" with science was much more common than with research until the early 1800s.
        ii. This is a derivative of the Latin *circare* and *circum*, meaning to encompass, encircle, or go around to complete a circuit, or as a noun meaning an encompassing or surrounding of an object, or a proximity partially embracing or comprehending it. *Circo* derives from the Greek *kirkos* and *kuklos*, meaning circle, wheel, self-contained cycle, and binding ring (e.g., circus) as well as a hidden predator, such as a hawk, that circles its prey. From *Kirkê* and *kirkos*, roots for Celtic and German places of worship, which tended to be circular, derives the word "church," first regularly used in the *Geneva Bible* (1557-1560) and the *Bishops Bible* (1568).
        iii. Indeed, research derives variably from a search for experience, home, knowledge, self, truth, Goddess, and God.
        iv. **Re-search**: Socrates, and by instruction Plato, abandoned methods of an empirical search of nature for that of the idealist search of the mind and soul for stable knowledge (i.e., Sophistic, somewhat *a posteriori*, sense particulars versus Socratic, Platonic, somewhat *a priori*, eternal essences). This was in defense of metaphysical knowledge and dialectic (*dialêktikê*) over empirical knowledge (*epistêmê*) and sophistry (*sophistikê*).
        v. Plato's description, in a later dialogue, of Socrates' handling of Meno's paradox of *zêtetikê* and *epistêmê* suggests the importance of this defense. Meno asks: "How will you aim to search for something you do not know at all? If you should meet with it, how will you know that this is the thing that you did not know?"
        vi. Socrates immediately pronounces the premise unsound and transforms it from a common, sophist, circular argument and skepticism (*zêtetikê*) to *dialêktikê*, here a maieutic process and search of origins. After reiterating the powers of the goddess Persephone to enlighten darkness in the underworld of Hades, Socrates summarizes:
            1. Then if the truth about reality is always in our soul, the soul would be immortal, so that you should always confidently try to seek out and recollect what you do not know at present— that is, what you do not recollect.
        vii. ***Eristikê***: to invent
            1. ***Heuriskein*** εὑρίσκειν: to discover, to find, to resolve, to invent
                a. Heuristics
                    i. Polya (1947, p. 112): "The aim of heuristic is to study the methods and rules of discovery and invention."
        viii. *Maisthai*: to search
        ix. *Môsthai*: to investigate or do philosophy
        x. ***Zêtetikê****, zêtein*: to search; refers much less to an empirical search than a mental or metaphysical seeking or search for truth or God in a Biblical sense.
        xi. ***Epistêmê***: empirical knowledge
        xii. ***Theoria***
        xiii. ***Historia***: to investigate. Barzun (1986, p. 321): statistical generalities will not serve, which is only to say again how science differs from history, from story. It is noteworthy that although the etymology of history takes us to the Greek word for

inquiry, the farther root his in Sanskrit and the Indo-European languages is related to vision, wit, vid, meaning sight and knowledge. Written history is literally a videogram: its main effect and clear characteristic is that it imparts knowledge by movement, consecutive and chronological, with a rational beginning, middle, and end.

xiv. **Enquire, Enquiry, Inquire, Inquiry**: to ask, question, to examine, seek out, question thoroughly; to demand via inquisition; to search, investigate.

b. Semantics

i. Research

1. In the TCPS 2, Research is defined as "An undertaking intended to extend knowledge through a disciplined inquiry or systematic investigation."
2. In the TCPS 1, research is "a systematic investigation to establish facts, principles or generalizable knowledge" (p. 17).
3. In the *International Financial Reporting Standards* (IFRS), Research is an "intangible asset" and defined as "The original and planned investigation undertaken with the prospect of gaining new scientific or technical knowledge and understanding. This should be distinguished from development, since the latter is capitalized whereas research costs must be expensed."
4. Lee (1982, p. 887): Definitions of research and development are of immediate concern. Ames [1] defines research as "a flow of new statements about the natural world" and development as "a flow of instructions (blueprints, diagrams, etc.) which enable the construction and equipment industries to build fixed plants to operate them when finished." Mansfield [7] defines research as "original investigation directed to the discovery of new scientific knowledge" and development as "technical activity concerned with nonroutine problems encountered in translating research findings into products and processes.
5. UK Arts & Humanities Research Council http://www.ahrc.ac.uk/Funding-Opportunities/Research-funding/RFG/Pages/Definition.aspx: the AHRC's definition of research is as follows: research activities should primarily be concerned with research processes, rather than outputs. This definition is built around three key features and your proposal must fully address all of these in order to be considered eligible for support:
    a. It must define a series of research questions, issues or problems that will be addressed in the course of the research. It must also define its aims and objectives in terms of seeking to enhance knowledge and understanding relating to the questions, issues or problems to be addressed
    b. It must specify a research context for the questions, issues or problems to be addressed. You must specify why it is important that these particular questions, issues or problems should be addressed; what other research is being or has been conducted in this area; and what particular contribution this project will make to the advancement of creativity, insights, knowledge and understanding in this area
    c. It must specify the research methods for addressing and answering the research questions, issues or problems. You must state how, in the course of the research project, you will seek to answer the questions, address the issues or solve the problems. You should also explain the rationale for your chosen research methods and why you

think they provide the most appropriate means by which to address the research questions, issues or problems.

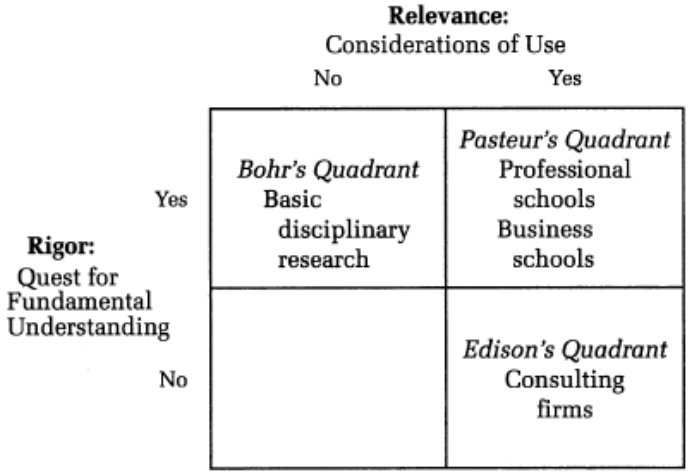
6. Stenhouse (1975, p. 142): "systematic enquiry made public."
7. Petrina (2012): Research is the process of methodically making knowledge.

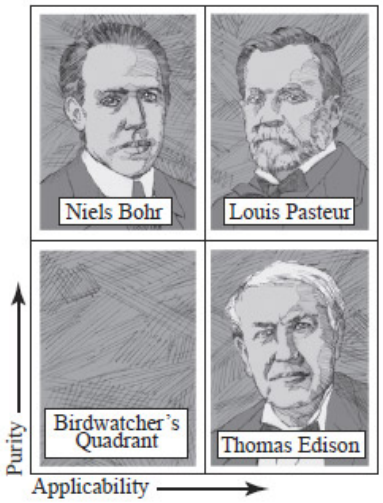
ii. Development

1. In the IFRS, Development is defined as "The application of research findings or other knowledge to a plan or design for the production of new or substantially improved materials, devices, products, processes, systems, or services prior to commencement of commercial production or use. This should be distinguished from research, which must be expensed whereas development costs are capitalized."
2. Development is never as straightforward as stereotypical definitions suggest: "translating research findings into products and processes" (Lee, 1982, p. 887).

iii. R&D

1. Models of **Innovation** or **Change** or **Progress**
    a. Sequential (somewhat linear)
        i. Schumpeter (1935) & Rogers (1962/1983): invention→ innovation→ diffusion
        ii. research→ design→ development→ production
    b. Reswitching (somewhat nonlinear)
        i. Pasteur's Quadrant





2. **Basic** Research
    a. Pure Research
    b. Fundamental Research
        i. Bench Science
        ii. Lab Science
3. **Applied** Research
    a. Practical Research

iv. Translation and Application

1. Translational Research is a means to accelerate the speed with which bench science translates into bedside therapeutics**….** Translating new basic scientific knowledge into enhanced clinical practice is a complex and challenging process that extends far beyond the development of a new drug, diagnostic test, or medical device. The process involves the integration of large heterogeneous sources of genomic and phenotypic data. The process

leverages tools and techniques to synthesize this data into usable information and the corresponding processes to facilitate cross-disciplinary research and collaboration as well as aid in knowledge discovery. Translational Research 2.0 provides a framework upon which medical and healthcare research can accelerate the diffusion of biomedical knowledge into common clinical practice and improve healthcare outcomes.

2. Application

v. Inquiry

1. Critical Inquiry is often defined as "using various modes of inquiry and interdisciplinary perspectives or methodologies to conceptualize, investigate, and derive meaning. It implies that learners are active learners, self-motivated learners, and learners who understand the ambiguities and uncertainties of achieving absolute knowledge, as well as the implications of various courses of action" (Skidmore College, 2005, http://www.skidmore.edu/administration/assessment/ *See "Critical Inquiry Report").
2. The journal *Critical Inquiry* was founded in 1974 for authors who "value examination of the assumptions underlying particular discriminations… and insist upon the highest standards of evidence relevant to conclusions drawn in practical criticism… criticism that aspires to be a special kind of 'learning'— not in any sense dispassionate or impersonal but something akin to that fusion of human commitment with objectivity that Michael Polanyi characterizes as 'personal knowledge'… disciplined criticism" (Sacks, 1974, p. iii). Hence, *CI* "aims to be independent of any theoretical bias. It promotes discussion and controversy about current critical trends, as well as reviving debate about more established critical traditions [i.e., critical theory and Kantian philosophy]."
3. In "Critical Pedagogy and the Futures of Critical Theory," Peters (2002) cautions, however, that critical inquiry as merely disciplined inquiry "does seem to rob critical theory of its original critical intent or to tame it, recasting it as a method of inquiry in the service of democracy… it is too easily denatured and stripped of its critical intent and reduced to 'thinking skills,' critical or otherwise." http://construct.haifa.ac.il/~ilangz/oslo/peters.htm
4. Inquiry-Based Learning and Teaching (Center for Excellence in Enquiry-Based Learning) http://www.ceebl.manchester.ac.uk/resources/papers/ceeblessay004.pdf

vi. Discovery

1. Boyer (1990, p. 17) *Scholarship Reconsidered*: The first and most familiar element in our model, the scholarship of discovery, comes closest to what is meant when academics speak of "research." No tenets in the academy are held in higher regard than the commitment to knowledge for its own sake, to freedom of inquiry and to following, in a disciplined fashion, an investigation wherever it may lead. Research is central to the Work of higher learning, but our study here, which inquires into the meaning of scholarship, is rooted in the conviction that disciplined, investigative efforts within the academy should be strengthened, not diminished.
2. The scholarship of discovery, at its best, contributes not only to the stock of human knowledge but also to the intellectual climate of a college or university. Not just the outcomes, but the process, and especially the passion, give meaning to the effort. The advancement of knowledge can generate an almost palpable excitement in the life of an educational institution.

3. Polanyi (1961, p. 246): discovery is defined as an advancement of knowledge that cannot be achieved by any, however diligent, application of explicit modes of inference.
4. Problem-Solving
5. Discovery Learning & Teaching
    a. Bagley (1905, p. 262): The pupil is not to be told but led to see…. Whatever the pupil gains, whatever thought connections he works out, must be gained with the consciousness that he, the pupil, is the active agent—that he is, in a sense at least, the discoverer.
    b. Bruner (1961, p. 77): discovery and the sense of confidence it provides are the proper rewards for learning. They are rewards that, moreover, strengthen the very process that is at the heart of education—disciplined inquiry

2. Histories of Research

a. Triple mission of the University (Petrina & Ross, 2014)

i. Research, Teaching & Service

1. Research, teaching, and service were fairly consolidated and interdependent in the origins of the modern university, ca. 1810, Berlin. The advancement of knowledge, for example, was commonly understood to be, as a given, in service of society. Inherent in science was service, to economy, society, and truth, if not God.
2. In North America, the institutionalization of the new engineering schools, such as MIT in 1861, and scientification of professional schools, such as Education, Law, Medicine, and Social Work in the late 1800s, pressed the issue of service in the constitutions and purpose of universities rather forcefully. The first Morrill Act (Land Grant Universities, 1862) and second Morrill Act (Black Universities, 1890) invested this triple mission in the new institutions.
3. By the turn of the century, "service," however overused, was in train with research and teaching.
4. However, more effectively than anyone, research, teaching, and service were ordered and put in train by Cattell, especially through his rankings of professors on bases of merit beginning in 1906 in *American Men of Science* but also through arguments for faculty governance.
5. **Service**
    a. Extension
    b. Outreach
    c. Development
        i. Field Development
            1. Curriculum Development
        ii. Professional Development
        iii. Continuing Education
        iv. Distance Education
        v. Service Learning
        vi. Community Engagement
    d. Dissemination
    e. E.g., UBC Faculty of Education
        i. In 1987, the Faculty of Education's Field Development Office (established in 1975) became the Distance Education Office (DEO). The DEO was changed to the Office of Continuing Professional Education (OCPE) and expanded to the Office of External Programs and Learning Technologies

(EPLT) in January 2003. In 2012, EPLT was changed to the Office of Professional Development and Community Engagement (PDCE)

f. In the 21st century, RT&S yields to…

6. Scholarship, Facilitation & Engagement

a. By and large, the blueprint for this reform of higher education is Boyer's *Scholarship Reconsidered*, a descriptive, historical, and normative report of the Carnegie Foundation for the Advancement of Teaching's tour across US institutions in the late 1980s. "Simply stated," Boyer concluded, "what we have on many campuses today is a crisis of purpose"— marked by a "divisive struggle on many campuses between 'teaching' and 'research'."

b. Boyer proposed in this report "four general views of scholarship: discovery, integration, application, and teaching…. the work of the professoriate might be thought of as having four separate, yet overlapping, functions. These are: the scholarship of *discovery*; the scholarship of *integration*; the scholarship of *application*; and the scholarship of *teaching*" (p. xii, 16).

i. Toyne (1998, p. 874): discovery is defined as original contributions to a particular body of knowledge, integration is viewed as the "drawing together" of several streams of discovery, and application is viewed as showing how knowledge can be applied to important problems and how important problems can define an agenda for research.

c. Boyer did not anticipate the segmentation of the professoriate, although he could have, and passed away in 1995, long before the "trilogy" research, teaching, and service were displaced. He provides a very helpful history and defense of the trilogy, yet his defense of service is quickly transformed into "engagement" through what he calls the "scholarship of application" and subsequently the "scholarship of engagement."

d. Boyer defined **engagement** as "creating a special climate in which the academic and civic cultures communicate more continuously and more creatively with each other." Service yields to engagement as "customer service" becomes an oxymoron. In "We Need a New Word for Service," Dar observes: "Talk about 'service' or 'volunteerism' and… eyes will glaze over very quickly."

e. The displacement of teaching by facilitation is a bit more complex, although again simplified in reduction to a popular text. "Teaching, in my estimation," Rogers asserted in *Freedom to Learn*, "is a vastly over-rated function." "I see the facilitation of learning as the aim of education," he continued. From thereon, the reduction of teaching to facilitation stuck: teaching is the facilitation of learning, making "teaching" somewhat redundant or by now outmoded.

f. In the 21st century, RT&S yields to…

7. Discovery, Learning & Engagement

a. Renewing the Covenant: Learning, Discovery, and Engagement in a New Age and Different World (Kellogg Commission, 2000, pp. 21-22):

i. By learning, we mean replacing passive modes of instruction that rely on students' acceptance of material from teachers with a more active process in which students and faculty take

responsibility for their own intellectual growth, drawing from the richness and diversity available on any major university campus.

ii. We understand discovery to be research, scholarship, and creative activity that reveal new knowledge, integrate it into existing bodies of disciplinary work, cross-pollinate disciplines, and possibly create something entirely new.

iii. By engagement, we refer to a redesign of basic university functions so the institution becomes even more productively involved with communities, however community is defined.

iv. e.g., Purdue University http://www.purdue.edu/strategic_plan/2001-2006/pages/westlafayette/wl_mission.html

v. e.g., Virginia Tech http://www.president.vt.edu/strategic-plan/executive-summary.html

1. Through a combination of its three missions of learning, discovery, and engagement, Virginia Tech continually strives to accomplish the charge of its motto: *Ut Prosim* (That I May Serve).

vi. University of Guelph http://www.uoguelph.ca/president/report/presents-report-2014.pdf

1. Learning, discovery and engagement have defined our approach since the campus was founded 150 years ago and since U of G was established 50 years ago. (p. 5)

vii. University of Toronto

viii. TRU

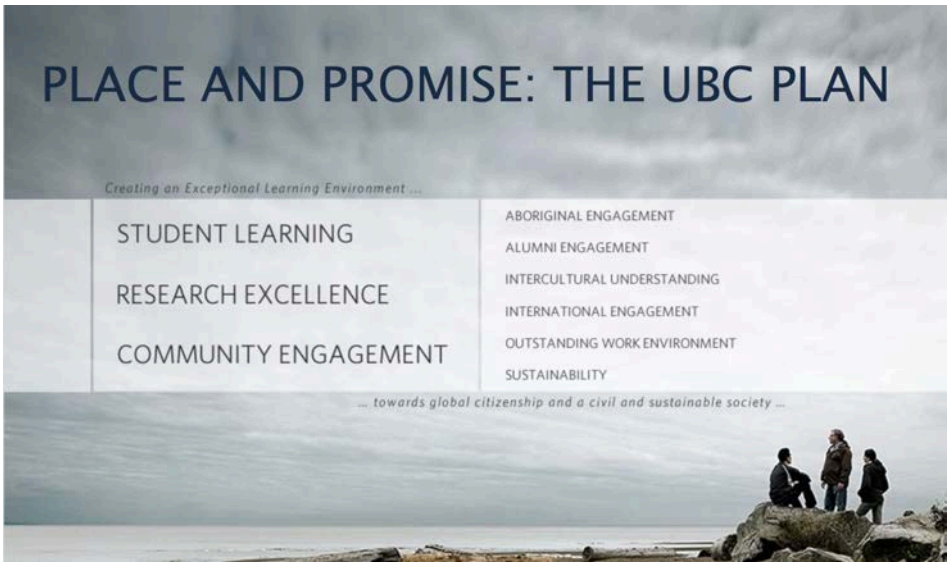
b. In the 21st century, RT&S yields to…

8. Research, Learning & Engagement

a. UBC 2010 *Place and Promise* http://strategicplan.ubc.ca or http://strategicplan.ubc.ca/the-plan/commitments/ or http://strategicplan.ubc.ca/files/2009/11/UBC-PP-Layout-Aug2012.pdf

i. The University's core commitments are to **student learning**, **research excellence** and **community engagement**. The remaining commitments have been chosen to support UBC's core mission, capitalize on strengths and focus attention on where the University most needs to grow.

ii. Research: The University creates and advances knowledge and understanding, and improves the quality of life through the discovery, dissemination and application of research across a wide range of disciplines.



b. Research 2.0

i. Is googling research?
   1. Is Google a research engine?
      a. Google's mission remains: "To organize the world's information and make it universally accessible and useful."
   2. Is Google a semantic engine?

ii. Is Wikipedia a reliable source?

iii. From web 2.0 to semantic web
   1. One of the more profound iterations on research over the past decade is versioning research 2.0. Yet what is research 2.0? Is it merely that the means of dissemination and translation from basic research to application have changed with new media and technologies? Does research 2.0 mean that we now have research media and technologies that our more senior mentors did not have? Does it mean that we now have open access to a myriad of publications from which we may learn and to which we may contribute? Does it meant that googling and tweeting is research? Or is it something much deeper?
   2. Similarly, one of the more profound insights into this is Latour's (1998) "From the World of Science to the World of Research?" What does he mean by 'from science to research'? Doesn't one imply the other? Things are perhaps worse than they seem: "There is a philosophy of science, but unfortunately there is no philosophy of research," he says. The difference between science and research begins with a new relationship between science and society: "They are now entangled to the point where they cannot be separated any longer" (p. 208). "That is what has changed most. Science does not enter a chaotic society to put order into it anymore, to simplify its composition, and to put an end to its controversies…. When scientists add their findings to the mix, they do not put an end to politics; they add new ingredients to the collective process" (p. 209).
   3. This changing relationship between science and society is more profound than it seems. It now more importantly can be understood as a "New Deal between research and society" (p. 209). Latour concludes: "Scientists now have the choice of maintaining a 19th-century ideal of science or elaborating with all of us, the hoi polloi-an ideal of research better adjusted to the collective experiment on which we are all embarked."

iv. Proliferation
    1. Proliferation of researchware, apps and devices
        a. Problem finding
        b. Data collection
        c.
    2. Proliferation of cybraries
    3. Proliferation of Dimensions
    4. Proliferation of methods
    5. Proliferation of paradigms
    6. Proliferation of data (e.g., big data, analytics)

v. Convergence
    1. Convergence of Methods
        a. Mixed methods
        b. Bricolage
    2. Convergence of researchware, apps and devices
    3. Converegence of cybraries
    4. Convergence of data

vi. New age of research | new age of discovery
    1. Resurgence of metaphysics
    2. Scope of spirituality

vii. Science 2.0

viii. Discovery 2.0

ix. Educational Research 2.0

x. Humanities Research 2.0
    1. Digital Humanities

xi. Social Science Research 2.0

3. Philosophies of Research

a. Mythology of Research

i. The goddess of science is Athena or Minerva, it has its Muse in Urania, and often its god is Apollo, companion of the Muses. The god of interpretation is Hermes, history has its muse in Clio, law has Dikê, medicine has Asclepius, Hygeia, Panacea, and Paean, technology has Daedalus, Hephaestus, and Prometheus, ecology has Gaia and Persephone or Natura, and psychology has Psyche. Athena (Minerva) emerges as wisdom manifest, born fully formed from Zeus' (Jupiter's) mind.

ii. Near the century's end, in 1897, two bronze relief sculptures of "Truth" and "Research" were permanently installed within the main doors of another sacred building of Reason, the newly constructed Library of Congress in Washington, DC (Figure 3). The sculptures are two sides of Minerva, the Romans' Athene or Athena, sketched by Olin Levi Warner and designed after his untimely death by Herbert Adams. As goddess of science, wisdom, and war, Minerva became an "icon of republicanism." For example, she was adopted for the seal of the American Philosophical Society, founded in 1743, and in 1780 for the American Academy of Arts and Sciences' (AAAS) seal with the insignia "*Sub Libertate Florent*," conveying that "arts and sciences flourish best in free states." Similar to Shakespeare's transformation of ancient epic into modern drama, here was a sentimentality that the visible form or outside was Roman (or Greek) and the inside was republican, Anglo-Saxon, American, French, etc.

iii. With the goddess Libertas, Minerva was the model for the "Armed Freedom" statue placed atop the Capitol Building across the street from the Library of Congress in 1868. Inside the library, a large mosaic of the goddess is subscripted in Latin,

translated to "not unwilling, Minerva raises a monument more lasting than brass." If Minerva was not patroness of the new library, one would be inclined to say "Truth" was more properly the God of the *Torah* and *Old Testament* (e.g., *Isaiah*, 65:16-17), or Dikê, although Heidegger argued that Parmenides deferred naming the goddess as such. At that time there were other goddesses to reference but "Research" was readily associated with science and Minerva.

Figure 3. "Truth" and "Research." Photos by Carol Highsmith. Public domain.

iv. What or who protects or can one summon for research? Athena (Minerva) emerges as wisdom manifest, born fully formed from Zeus' (Jupiter's) mind. Are the origins of research so secular as to be exclusive of a god or goddess, and thereon prohibiting any theism, deism, or mythology of the practice to this moment? Is it that research is in denial of its mythology and theology or is it just a paucity of research on research?

Figure 5. Kirkê and Odysseus on a Boeotian vase, ca. late 5th BCE. The representation is likely drafted from an Orphic stage caricature. Copyright expired.

Figure 8. Circe by Patten Wilson. Copyright expired.

b. Postsecular Metaphysics of Research
c. Epistemology
d. Methodology
    i. Etymology & Semantics
        1. Method
e. Philosophy of Research
    i. Although there is a deep and dynamic philosophy of science, outside of methodology "there is no philosophy of research," as Latour (1998, p. 208) observed.
f. Paradigms (Kuhn)
    i. Thomas Kuhn (1962) *Structure of Scientific Revolutions*
        1. Paradigm
        2. Paradigm Shift
        3. Progress
        4. Second Thoughts ("Postscript—1969")
        5. General Overview
        6. In *The Structure of Scientific Revolutions*, Kuhn presented a sociological analysis of the scientific process that has, since its publication in 1962, has been controversial in both the philosophy and history of science. Kuhn's ideas proved to be general challenges to "received" and similar philosophical conceptions, and to traditional historiographical models of science. In response to criticisms, Kuhn amended and clarified his views a bit in the 1970 edition and again in 1990.
        7. According to Kuhn, mature science proceeds temporally in alternating periods of one of two states: normal or revolutionary. Normal science rests on the establishment of a "paradigm," or what Kuhn later called a "disciplinary matrix." The various elements of a paradigm, which shapes normal science, are: symbolic generalizations, shared beliefs and commitments, shared values, and exemplars or exemplary problem-solutions. A community of scientists working within a normal science paradigm share a body of generalizations which can be cast in symbolic form, such as f=ma. These scientists also share beliefs in, and a commitment to models that metaphorically and heuristically help to shape theories and explanations. They also share values related to technique, prediction, marginality, presentation, and other similar norm-referenced means. And finally, a scientific community depends on exemplars, usually textbook problems and laboratory exercises that articulate the paradigm itself to students and other interested parties.
        8. Sociologically, a paradigm is shared by a community of practitioners "of a scientific specialty" who are involved in the typical puzzle-solving activity needed to fine-tune theories and models of nature. Science within a paradigm is a highly directed problem-solving, evidence-gathering and theory-articulating process. Normal science also tends to be highly selective. Scientists are encouraged to work on only those problems and puzzles that can be solved. As work within a paradigm proceeds, puzzles are found that resist solution and unexpected results generate crises. Kuhn labels these problems, bottlenecks, and kinks "anomalies." The practice of normal science breaks down as evidence is brought to bear on the inadequacies of the paradigm and scientists are unable to reconcile anomalies with their paradigmatic assumptions.

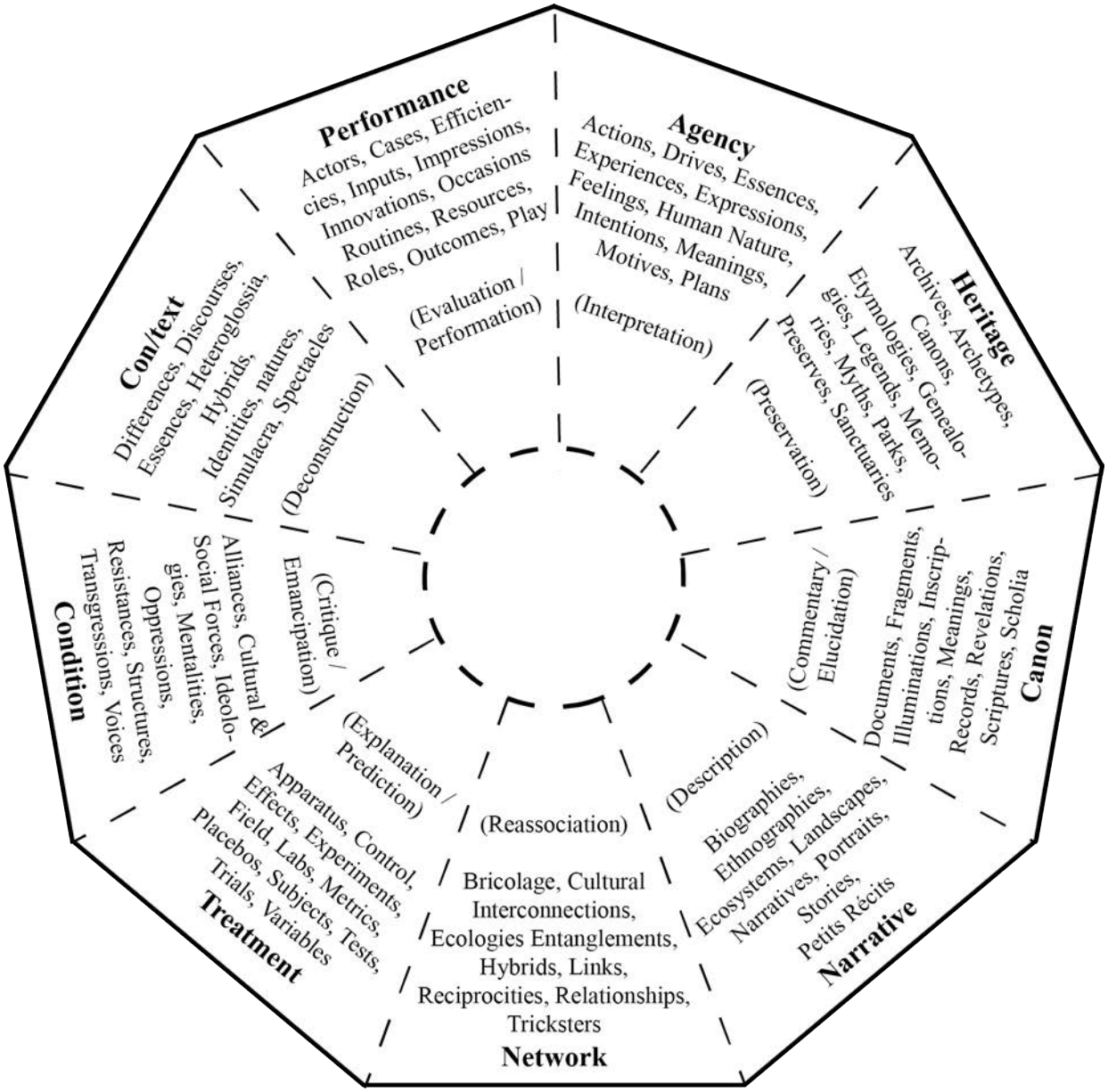
9. Science, in the face of anomaly-induced crises, tends to be revolutionary. Scientists generate and test new theories, community structure deteriorates, and alternative paradigmatic commitments begin to take shape. Kuhn wrote that
    a. the extraordinary episodes in which that shift of professional commitments occurs are the ones known… as scientific revolutions. They are the tradition-shattering complements to the tradition-bound activity of normal science.
10. Eventually, scientific communities are reoriented toward a new paradigm and normal science. Old theories and exemplars are removed from the pedagogical process and retain only historical value. Kuhn then, has suggested that scientific knowledge is characteristically discontinuous. Scientific knowledge changes through revolutions and is not cumulative. Kuhn's model has been criticized for its lack of rational qualities and its validity within the history of science.
    a.

g. Paradigms or Genres (post-Kuhn)
    i. Guba, E. G. & Lincoln Yvonna, S. (1990). Competing paradigms in qualitative research. In N. Denzin, K. & Y. S. Lincoln (Eds.), *Handbook of qualitative research* (p. 424). Newbury Park, Calif.: Sage Publications.

Basic Beliefs (Metaphysics) of Alternative Paradigms

	Positivism	Postpositivism	Critical theory	Constructivism
Ontology	Naïve realism – "real" reality but apprehendable	Critical realism – "real" reality but only imperfectly and probabilistically apprehendable	Historical realism – virtual reality shaped by social, political, cultural, economic, ethnic, and gender values, crystallized over time	Relativism- local and specific constructed realities
Epistemology	Dualist/objectivist; findings true	Modified dualist/objectivist; critical tradition/community; findings probably true	Transactional/subjectivist; value-mediated findings	Transactional/ subjectivist; created findings
Methodology	Experimental/manipulative; verification of hypotheses; chiefly quantitative methods	Modified Experimental/ manipulative; critical multiplism; falsification of hypotheses; may include qualitative methods	Dialogic/dialectical	Hermeneutical/dialectical

h. More Images


Performance
Actors, Cases, Efficiencies, Inputs, Impressions, Innovations, Occasions Routines, Resources, Roles, Outcomes, Play
(Evaluation / Performation)
Agency
Actions, Drives, Essences, Experiences, Expressions, Feelings, Human Nature, Intentions, Meanings, Motives, Plans
(Interpretation)
Heritage
Archives, Archetypes, Canons, Etymologies, Genealogies, Legends, Memories, Myths, Parks, Preserves, Sanctuaries
(Preservation)
Canon
Documents, Fragments, Illuminations, Inscriptions, Meanings, Records, Revelations, Scriptures, Scholia
(Commentary / Elucidation)
Narrative
Biographies, Ethnographies, Ecosystems, Landscapes, Narratives, Portraits, Stories, Petits Récits
(Description)
Network
Bricolage, Cultural Interconnections, Ecologies Entanglements, Hybrids, Links, Reciprocities, Relationships, Tricksters
(Reassociation)
Treatment
Apparatus, Control, Effects, Experiments, Field, Labs, Metrics, Placebos, Subjects, Tests, Trials, Variables
(Explanation / Prediction)
Condition
Alliances, Cultural & Social Forces, Ideologies, Mentalities, Oppressions, Resistances, Structures, Transgressions, Voices
(Critique / Emancipation)
Con/text
Differences, Discourses, Essences, Heteroglossia, Hybrids, Identities, natures, Simulacra, Spectacles
(Deconstruction)