

# Philosophical bases of research methods: An integrated narrative review

Brian A. Vasquez  
Center for Research and Development  
University of the Visayas  
brianquez@gmail.com

Date Submitted: April 26, 2014

Date Accepted: June 6, 2014

Republished from:  
Recoletos Multidisciplinary Research Journal  
Part 1 in Volume 1 Issue 2 (2013) and Part 2 in Volume 2 Issue 1 (2014)

## ABSTRACT

This narrative review examines the philosophical bases of research methods in terms of: (1) ontology; (2) epistemology; (3) axiology; and (4) methodology. It explores the diversities and similarities between paradigms. Three search strategies were observed including: (1) data search for published research; (2) public engine and manual search; and (3) stakeholders input. Subthemes under ontological assumptions include: (1) singular vs. plural reality; (2) empirical vs. subjective reality; (3) scientific vs. sensuous reality; (4) when the singularity and plurality of reality converge; (5) definitive vs. subjective truth; (6) continuum versus polarity; (7) what really is real; (8) truth, reality and knowledge; and (9) seeing the truth and reality of an object/subject from a different perspective. Subthemes under axiological assumptions include: (1) fact-value divide/dichotomy; and (2) ethics. Subthemes under methodological assumptions are: (1) scientific versus naturalistic: hard versus soft science; (2) convergence and divergence; (3) linearity is only in the books and not in practice; (4) hard or easy; (5) theory, frameworks and literature review; (6) non-statistical approaches in positivistic approaches; and (7) complementarity. The focus of the lens is guided by philosophical stances. Each paradigm seeks truth, reality and knowledge. Though quantitative inquiry claimed objectivity and qualitative inquiry claim subjectivity, both inadvertently observe the same processes. The division is a continuum that delights its deficiencies. It is when divergence converges.

**Keywords:** *quantitative-qualitative divide, philosophical stances, ontology, epistemology, axiology, methodologic*

“Mathematical research does not use statistics, but the proofs involved could by no means be described as subjective and less firm for that; even research into mathematical statistics and probability does not make use of statistics to prove and produce useable results.”

Nimal Ratnesar, 2005

## I. CONTEXTUAL GROUNDING AND ITS SIGNIFICANCE

Those who perpetuate the quantitative-qualitative divide fails to appreciate that distinctions for both are necessary. It is desolate to note that some individuals who flop to understand the nature of the other paradigm as well as those those who are totally confused in the application of both paradigms disappoint by not giving time to probe enough literature. Although there have been numerous publications on the differences between quantitative and qualitative approaches available, only few authors attempt to amalgamate them in one literature. This undertaking is not an attempt to produce a cookbook, but to yield a narrative integration of the available information that helps avoid the confusion and divide. Particularly, this review targets to integrate existing literature narratively to delineate quantitative and qualitative approaches. It helps: (1) novice researchers differentiate both research traditions; and (2) advance beginners to experts from a specific orientation of research paradigm to understand the nature of the other approach.

## II. REVIEW FOCUS

The aim of this review is to examine the philosophical bases of research methods. Specifically, it answers the following:

1. What are the differences between quantitative and qualitative research methods in terms of:
  - 1.1. Ontology;
  - 1.2. Epistemology;
  - 1.3. Axiology; and
  - 1.4. Methodology?
2. What are the similarities between quantitative and qualitative research methods?

## III. LITERATURE SEARCH

This review of the literature used three search methods: **Database Search of Published Research**. Electronic academic databases were scanned using Ebscohost research database

service. The databases include: (1) Academic Search Premier; (2) ERIC; (3) Library, Information Science & Technology Abstracts; (4) Military and Government Collections; and (5) Primary Search; **(b) Public Engine and Manual Search**. Google scholar search was also done to circumvent publication bias. I utilized books about research design and methodologies; and **(c) Stakeholder Input**. Academics, stakeholders, and researchers were corresponded via electronic mail and mobile phone calls. They identified some supplementary details appropriate to the research questions.

**Search Procedure and Criteria**. Manual search was done for books. Systematic electronic search was done for databases and public search engines. I exploited search engine stratagem by the use of boolean operators, phrase search, nesting, mathematical operators and truncation (wildcards). Terms searched were: (1) quantitative; (2) qualitative; (3) quantitative-qualitative debate; (4) quantitative-qualitative divide; (5) ontology; (6) epistemology; (7) axiology; (8) methodology; (9) rhetoric; and (10) philosophy of research. Publications covered the period 1980 to present. Cited sources with date of publication earlier than 1980 were the sources recommended by the experts. I included only those publications in the English language. The publications that were searched underwent screening to check: (a) relevance to the research questions; and (b) appropriateness of empirical, methodological and philosophical discussions or reviews.

## IV. DATA EVALUATION AND SAMPLING

Although they engaged selected features of the systematic review, not all publications culled have extensive high quality evidence. I did not exclude publications on the basis of quality criteria. The selection of samples was based on logical exposition and relevance to the domain of inquiry. Intensive narrative approach was suitable in order to examine the gamut of research queries. There are 68 articles and 78 books cited in this review.

## V. DATA ANALYSIS

I began the synthesis by keeping the following things in mind (Mertens, 2010):

**Organization.** I developed a flexible framework for the organization as I search for data. The framework made it easier for me to approach the synthesis stage. It is flexible because the formulation of my conceptualization added, deleted, and redefined categories as I moved along with the review process. I exploited a more thematic organizational approach.

**Narrative Synthesis.** The narrative approach to literature synthesis is trailed in this review. I organized the studies in a conceptually logical sequence and afforded adequate element about the literature to support germane critical analysis. The amount of details culled from literature was influenced by the nature of the domain of inquiry:

1. It includes a number of journal article and textbooks selected on the basis of relevance, presented in a composed representation, that inaugurated the rationale; and
2. The actual review was extensive and organized into meaningful categories. This provided a gestalt of the topic and described the methods used to search the literature. I provided an organization of the subtopics and cited literature that showed agreement or disagreement.

## VI. MAJOR CLASSIFICATION OF RESEARCH METHODS: QUANTITATIVE AND QUALITATIVE

The major classifications of research method are quantitative and qualitative research. This segment dissects the distinction of both methods while aiming to delineate the differences in process, utility and philosophy. This paper does not aim to promote the quantitative-qualitative divide but to foster understanding that each method views reality differently and proceeds to finding truth distinctively – not to promote fraction, but to describe reality in dissimilar but equally logical ways.

Berg (2007) claimed that qualitative

research denotes to the what, how, when and where of the piece of inquiry: its essence, character and environment expressed in meanings, phenomenon, metaphors, symbols and description. Tewksbury (2009) defined quantitative research as more scientific approach focusing on specific definitions via operationalization of terms, concepts and variables – expressed in numeric calculations.

According to Mertens (2005), life is convoluted, and the world is not impeccable. Research tries to unfold these by deriving knowledge from scholarly literature, experimentation or community interaction. It is to understand, describe, predict and control. However, a specific form of research paradigm or tradition can never capture the fullness of the phenomenon. Each has its own convolutions and imperfections. Two genres crisscross but take very distinct trails. This article summarized the commonalities and distinctions of both major research traditions.

I grounded my discussions with the philosophical assumptions. Schwandt (2002) claimed that this is necessary and no investigator escapes in this course. Creswell (2007) believed the same thing especially when using qualitative research. However, Patton (2002) thought otherwise. He argued that philosophical viewpoints are problematic since it hinders scholarship. Personally, I subscribe in the former claim. The theoretical concern (referred as philosophical underpinning by Schwandts) is focused on the ontology and epistemology of knowledge and reality. I however argue that this is not similar to the theoretical framework as understood by many (as expended in quantitative research). It is quite clear in qualitative research wherein the specific research tradition has its own inherent theoretical (philosophical in nature of viewing reality) bases. This framework is not consumed to interpret data based on predetermined concepts, as trailed in quantitative research, but rather on how I viewed knowledge and reality. Readers should not view it as the same. Otherwise, the researcher gets confused.

Quantitative researchers philosophically trailed in either or a combination of but not limited to positivism and empiricism. In most cases, quantitative researchers are unaware that they are following specific philosophical assumptions. If we follow Patton's claim, it derails the researcher's frame of mind and end up lost in the journey. Since decisions are not grounded to any philosophical stance, it becomes scrawny and unscholarly.

## VII. ONTOLOGICAL ASSUMPTION

Ontology is the study of being (Crotty, 1998). It is concerned with what institutes reality. It

answers the question, *what is* (Crossan, 2011; Polit & Beck, 2008). Investigators are required to take a locus *vis-à-vis* their acuties in what way objects (Scotland, 2012): (1) certainly are; and (2) categorically work. This philosophical stance is required in conducting research to provide grounding on the perceptual perspective of the researcher. It guides the investigator on what to look for and in how to methodologically capture the phenomenon.

The matrix below digests the difference between quantitative or qualitative research designs in terms of the nature of realities being scrutinized.

**Matrix 1.** The Nature of Reality

Quantitative	Qualitative
Reality exist and it can be determined	Reality is multiple and relative
Singular reality	Multiplicity of reality
Scientific and explanatory of reality	Sensuous reality
Realistic ontology (objective reality)	Relativistic ontology (subjective reality)
Talks about the properties of and relations of things	Talks about the multiple experiential realities and its diversity
Quantified quality and descriptions (reduced into numbers/numerical assignment)	Narrative account of multiple properties
Determines definitive truth and denounces subjective truth by measuring it objectively via numerical translation.	Recognizes that there is no definitive truth only subjective truth.
Provides a sedimented and limited view of concerns but highly measurable and computable.	Provides an in-depth understanding of concerns that is not conceivable by means of statistically-based examinations.
Provides reduced, decidedly controlled but predictive understanding of concerns.	Centralizes and places primary value on comprehensive and holistic understandings, and in what way actors comprehend, experience and maneuver within environments that are dynamic and collective in their groundwork and construction.
Seeks to determine and explain reality	
Continuum of determining the different aspects of reality (quantitative in one side and qualitative in another)	
Alternatively, seen as a divide. The polarity between causes the quantitative and qualitative debate.	

**Singular versus Plural Reality.** Pure positivist, as classical quantitative researchers posit, believed that there is only one reality that exist (Guba & Lincoln, 1994). This existent reality can be determined. Polit and Beck (2008) claimed that the phenomenon is not haphazard, random or erratic occurrences but have antecedent origins (causality, but sometimes considered association instead of causality). Commencing from an axiom (assumption), the basic principle that is believed to be true without proof or verification, it trailed a deterministic nature (Rubin & Babbie, 1993). It is not the same with naturalism (Bird, 2004; Norton, 2007; Steel, 2005), the paradigm used in qualitative research. Naturalists acknowledged the multiplicity of reality (Creswell, 2007) with existing core pattern or theme. It is naturally constructed (Mertens, 2010). All constructions observe the philosophy of interpretivism (Altheide & Johnson, 1994; Kuzel & Like, 1991). In fact, all meanings are interpretative in nature (Heidegger, 1971, 1962). It tells us that investigators must attempt to understand from the viewpoint of those who lived the phenomenon. Acknowledging the strength of the latter, postpositivist (contemporary form of quantitative research) acknowledged that things cannot be known perfectly (Maxwell, 2004) and thus recognized alternative forms of explanation (Borman et al., 2007). It is believed that objective reality is nonexistent since there are manifold social constructions of meaning and knowledge. Schwandt (2000) believed that the mind is operating in the production of knowledge, and no thinker thinks totally the same although at times similar.

Obtaining multiple perspectives (from different informants amalgamated with the researchers own perspective), in qualitative

research, yield better interpretation of meaning (Clegg & Slife, 2009). The concept of objectivity is then replaced with confirmability (Guba & Lincoln, 1981; LeCompte & Goertz, 1982). It can be derived via multiple data sources: triangulation technique (Campbell, 1956; Campbell & Fiske, 1959; Denzin, 1989; Polit & Hungler, 1999) or verifiability with participants (Burnard, 2008). Appreciating the latter argument, contemporary quantitative researchers recognized that *a priori* of the investigator could influence what is observed (Reichardt & Rallis, 1994). It means that investigators can never be totally objective (Paley, 1997). However, guided with the principle that one should remain neutral (Mertens, 2010), it can be controlled (Beck, 1994). In addition, the participants in qualitative research are also called co-researchers (Burnard, 2008). They have an important role in sharing the data, and in analyzing and interpreting them (Mertens, 2010).

**Empirical versus Subjective Reality.** Quantitative researchers are highly realistic, demonstrated as empirical or positivistic (Leach, 1990; Duffy, 1985; Schlick, 1959; Friedman, 1991; Werkmeiser, 1937a,b) while qualitative researchers are relativistic, capturing subjective reality (Swandt, 2000). When quantitative researchers view an object, they need to observe it by the senses (Polanyi, 1962). Then one claims that it occurred, or it is positive – referring to an observation by the senses. Qualitative researcher looks at objects differently. When phenomenon is experienced, the perceptual interpretation of that certain involvement is highly relative contingent to how and in what perspective the individual is gazing.

### **Scientific versus Sensuous Reality.**

Quantitative research captures scientific reality while qualitative research captures sensuous reality (Borgdorff, 2009). Both paradigms capture reality. However, it must be understood that they are looking at reality differently (Rubin & Babbie, 2001). Quantitative researchers view qualitative research as nonscientific because it: (1) is insider knowledge (Howe, 1988; Howe & Eisenhart, 1990); and (2) do not engage in the etymology of frequentist or classical statistics (Small, 2008). Howe & Eisenhart (1990) however argued that quantitative research must not use its positivistic framework in evaluating qualitative researches. Gerring and Thomas (2011) contended that quantifiable observations deduce the population that is enthusiastically measured, counted, and hence compared (monothetic). In contrast, naturalistic observations posit an empirical field where substantiation are not numerically measured thus cannot be directly compared with one another (idiographic). It is explained more in the methodological assumption.

**When the Singularity and Plurality of Reality Converge.** Going back to the discussion of singularity and plurality of reality, it is facetious to note that if you dissect the core of both, they are similar. Quantitative research claims singularity of reality but at the same time recognizes the differences in terms of demographics. In qualitative research, it recognizes the plurality of reality but at the same time acknowledges a principal pattern, in most cases singular in nature. Both are talking different things, but they are in actuality doing the same things. The initiators of the divide failed to acknowledge the convergence of both. The distinction relies on the differences of perspective. Each focused their lenses from different locations or origins with different concentrations of which side of the object. Both attempt to capture what is real and truthful. However, we must also put in mind that we are looking at the same thing. Though superficially divergent, it actually converges in a metacognitive level.

### **Definitive versus Subjective Truth.**

Both methods capture truth. However, they interpret and see the truth differently. The quantitative researcher claims definitive truth (Mertens, 2010). It is highly concomitant with the previous empirical, scientific and positivistic claim. However, qualitative researchers say it does not exist (Koch & Harrington, 1998; Payne, Seymour & Ingleton, 2003; Racher & Robinson, 2002). There is truth but not definitive, only subjective (Berger & Luckmann, 1966; Smith, 1983).

“... the scientific method ... : everything is open to question. That means in our quest to understand things, we should strive to keep an open mind about everything we think we know or that we want to believe. In other words, we should consider the things we call ‘knowledge’ to be provisional and subject to refutation. This feature has no exemption...”

Allen Rubin & Earl Babbie, 2001

**Continuum versus Polarity.** Quantitative and qualitative researchers seek to determine and explain reality (Kuhn, 1962, 1970a,b,c; Polit & Beck, 2008; Creswell, 2007). The polarity between both approaches causes the quantitative and qualitative debate (Fitzgerald & Howcroft, 1998). While others view it as a divide, alternatively, it can be observed as a continuum of determining the different aspects of reality (Holden & Lynch, 2004; Morgan & Smircich, 1980): quantitative in one side of the gamut and qualitative in the other.

The polarity can be traced from the Khunian framework (1962). However, one can view a specific research practice as a research tradition rather than a specific paradigm (Clark, 1998). The Laudanian framework (1977) believed that all paradigms could co-exist. There are multiple origins with multiple trails to track (Cook, 1985). Therefore, the Laudanian framework views it as a continuum rather than mere bipolarity.

**What Really is Real?** Rubin and Babbie (2001) dissect reality. Firstly,



they differentiated agreement reality from experiential reality. Agreement reality is when it is believed to be real because everybody thinks it is real while experiential reality is the actual direct experience itself. They further categorize reality as premodern, modern and postmodern. The premodern view of reality assumed that things are seen as they were though they are. It is collectively uninominal (beliefs of our ancestors). It was believed because it was culturally agreed. Recognition of diversity came after interracial connectedness; the modern view thinks reality as binomially relative and more binomially opinionated (I think it is or not; I think it exists or not). It means that each respects each other's view of reality. However, postmodern view of reality offers different multiple ways of viewing things. A little bit similar to the former, it emphasized the different manifold perspectives. The modern view accentuates the unavoidability of subjectivity while the postmodern view insinuates the absence of definitive objectivity, only relativity.

What is real need not be all the time: (1) empirical and positive – observed by the senses; (2) instrumental – measurable and operational; (3) reductionist – reducible to numeric form; (4) material – always have matter. Sometimes what is truthful and real are experienced naturally, perceived relatively by each other, and conceived constructively by our mind and emotion. These things can never be objective, empirical, positive, instrumental, reducible and material. We can forcefully measure them in these ways, but it can never capture the fullness of truth. It is best explained by the coherence theory of truth wherein to understand it there must be consistencies, conceivability or systematic coherence (Joachim, 1906; Young, 2013) regardless of empirical and material evidence.

The significant whole constitutes the elements of the ideas constructed and intuited by the mind (Joachim, 1906; Bradley, 1914). This idealistic philosophy has a metaphysical position that the aggregate of beliefs is reality. This belief is truthful to the degree that it coheres with other

beliefs (Bradley, 1914; Walker, 1989; Young, 2013).

The positivist portion of the Khunian framework (1962; 1970 a, b, c) has its roots based from the positive philosophy of August Comte in 1848. Comte categorized three fundamental laws of development, which explains truth and reality. The theological/fictitious state is the intellectual reasoning of reality. It deals with absolute knowledge, which is considered to be the reasoning of the first and final cause. It is the explanation of the inner nature of being (spiritual/supernatural). The metaphysical/abstract state is the reasoning based on abstraction. It is a transitional state towards positive philosophy. Reasoning is based on non-tangible abstraction that is linked to conceivable real or personified entities. The last state is the scientific/positive state. This fixed and definitive form of reasoning is based from empirical observation. Comte believed that the human mind can never obtain absolute truth (omnipotent truth: usually referred to as the Supreme Being) thus gives up the search of the origin of the universe and final cause of all phenomena. With this stance, phenomenon is reduced to any empirically conceivable form because this is the only measurable form of reality.

## VIII. TRUTH , REALITY AND KNOWLEDGE

Bird (2004) recognized that there is a relationship between truth, reality and knowledge. He further claimed that truth depends on the way the world is: it is a matter of structural correspondence between that world and the propositions. Kuhn (1962; 1970 a, b, c), the proponent of the research paradigm differentiating quantitative and qualitative, believed that the truth could not be recognized. Khun realized that apart from objectivity and empiricism, science could be naturalistic and relativistic. It only suggests that the knowledge derived from research is only a certain kind of recognition of the claimed well-established truth. The weakness of this claim is the strength of the naturalist. The naturalistic paradigm recognized

that the only perceptible truth is the truth relative to the observer's lens which is distinct from each other, id est a multiple perspective. In some respect, some positivists are naturalist (Prestone, 2004) and this is also true otherwise.

**Seeing the Truth and Reality of an Object/ Subject from Different Perspectives.** I am presenting different parables, allegories or schools of thought that help confirm the multiple ways of seeing truth and reality. These help us understand that each perspective is a valid representation:

**The Parable of the Table.** When one is asked to describe the reality of the table, the description of the table is referent to the location of the person describing it. In essence, people viewing the table have similar descriptions. However, specific variations are noticed depending upon: (1) which side of the table the describer is looking at; and (2) what metaphysical "eyewear" the describer is wearing. All descriptions are equally acceptable. The diversity of the description is based on the describer's: (1) position against the table (relative to which side of the object is being viewed at); and (2) the type of lens the describer is using (philosophical worldviews, paradigms, sets of beliefs, assumptions and frameworks).

**The Id, Ego and Superego.** The topography of our personality talks about the psychoanalytic provinces of the mind (Freud, 1961). The id functions in the primary process where drives are satisfied by forming mental images. It is the intellectual part of the self. The ego functions in the secondary process via reality testing. The secondary process locates the mental image formed by the primary process into the empirical reality. The superego functions as the social part of the self and sees things as a normative reality. In relation to research, the id and the superego are the province of the mind among qualitative researchers that capture emotions, behavior, perceptions, artistry and morality. The ego is the province of the mind among quantitative researchers, which captures the measurable empirical objects.

**Gestalt Psychology.** The human mind tends to (Wagemans et al., 2012): (1) group visual objects using the principle of proximity, similarity, common fate, good continuation, closure, symmetry, parallelism, synchrony, common region, element and uniform connectedness; (2) integrate and complete contours; (3) organize figure-ground; and (4) assign border ownership. The neural mechanism of the visual field is so dynamic and complex that neurophysiological evidence converges on the idea that the response of cortical neurons depends on the properties of the overall configuration of the senses and the parameters of the stimulus. Illusory processes may happen even in highly empirical observation or experience. Interpretation is not atomistic but holistic. Thus, the whole is not equal to the sum of its parts. Context-sensitivity is emphasized here. In the application to research, it demonstrates the supremacy of subjectivity over empirical procedures. The reductionist, materialistic and atomistic principle in quantitative or positivist research is conquered by the context-laden nature of the mind. It interprets in a holistic manner and less atomistic. It is the strength of the naturalistic paradigm.

**The Müller-Lyer Illussions (Franz Müller-Lyer, 1889).** Observe the figure below:

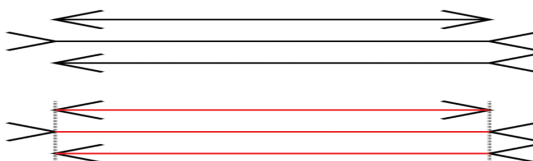


Figure 16. The Müller-Lyer Illussions

The lines in the figure have equal lengths. However, our mind processes things differently. In relation to research, our description of reality is dependent on how our brain process the information as perceived by the senses.

**The Allegory of the Cave (Plato, 360 BCE/1941).** It is the Platonic representation of an



**Matrix 2.** Relationship of Inquirer and Object/Subject of Inquiry:Epistemological Assumption

Quantitative	Qualitative
Dualistic epistemology	Monistic epistemology
Inquirer is independent from the object of inquiry	Inquirer and the one being inquired is dependent to each other
Requires an inquirer and object of inquiry	

extended metaphor that is to juxtapose the system in which we perceive and believe the reality. The thesis and basic tenet is that we imperfectly perceive the ultimate forms: the representation of truth and reality. The allegory talks about a prisoner in the cave who has not seen the outside world and perceives that the reality is portrayed by the shadow. When the prisoner was released to the real world, he cannot identify what is real and was confused. This allegory is similar to the story of a young blind man who never had a chance to see the real world since young. After a successful operation, this blind man cannot differentiate real apples from pictures. In relation to research, our perception of reality is dependent on how we interpret our experience relative to our previous conception or exposure. There is no blueprint interpretation. Each interpretation of reality is unique.

**IX. EPISTEMOLOGICAL ASSUMPTION**

Epistemology is the theory of awareness that outlines the form of knowledge that is probable and reasonable (Crotty, 1998). Matrix 2 digests the difference between quantitative or qualitative research designs in terms of the relationship of the inquirer to the object/subject of inquiry, *id est* the application of epistemological assumption.

**Independent versus Dependent.** If we try to dissect its similarity, both have an inquirer and object/subject of inquiry. However, the difference lies between the relationships of both. Quantitative researchers, especially pure positivist, are dualistic in terms of inquirer-object relationship in research. This individualistic philosophy is needed to maintain objectivity. It means that both do not influence each other (Lincoln & Guba, 2000) thus independent. Qualitative researchers believed the contrary (Lincoln & Guba, 1994). It is grounded on the assumption that the inquirer and object are interlocked in an interactive process (Tewksbury, 2009; Mertens, 2010), dependent on each other (Baruch, 1981; Woodhoude & Livingood, 1991; Polit & Beck, 2008). They are constantly influencing respectively in the exploration of data. Lincoln and Guba (2000) believed that research could only be conducted in an interactive process – hermeneutic, dialectical or any interpretative process.

**X. AXIOLOGIC ASSUMPTION**

Oduor (2010) defined axiology as the theory of values. Matrix 3 below digests the difference between quantitative or qualitative research designs in terms on how values are utilized or controlled in the study. It is subdivided into two categories: (1) fact-value divide/fact-value dichotomy; and (2) ethics.

**Matrix 3.** Fact-Value Divide / Fact-Value Dichotomy

Quantitative	Qualitative
Values are held on check (theory-laden nature)	Values are inevitable and desirable (value-laden nature)
Objectivity is sought	Relativity provides thick and relevant description
Control is imposed to eliminate extraneous variables	Control is unnecessary, variation of the phenomenon provides a more meaningful data
Empirical facts	Moral and aesthetic judgment as facts
Do not believe in moral truth	No means to separate facts from subjective truth or fiction
No means to defend values	Values are necessary
Truth is instrumentally determined and operationalized	Truth has subjective provenance and is determined non-instrumentally
Instrumental reasons	Non-operational reasons
Empirical fact-discourse	Value-discourse
Respect privacy, informed consent, minimize harm, etc. (Imposed procedures to observe beneficence, respect and justice)	Balanced exemplification of interpretations, foster partakers' awareness and community camaraderie

**Fact-Value Divide / Fact-Value Dichotomy.**

Quantitative research believed in objective scientific knowledge, and it is viewed as valid, certain and accurate (Crotty, 1998). Campbell together with Stanley (1963/1966) revised this claim. They argue that it is probability and not certainty. Crotty's claim is totally impossible since nothing is certain in research (Cook & Campbell, 1979; Shadish, Cook & Campbell, 2002). Qualitative research thinks otherwise. Facts and values are interlocked. In determining the facts, values are inevitable and desirable (Polit & Beck, 2008), necessary for thick description (Lincoln & Guba, 1985; Sandelowski, 2004; Warren & Karner, 2005).

The fact-value divide or fact-value dichotomy is further dissected in the concepts of: (1) empirical *versus* value discourse; (2) control; and (3) instrumentation:

**Empirical versus Value Discourse.**

Quantitative research determines empirical fact while qualitative research establishes moral and aesthetic judgement as fact (Callicott, 2002; Sagoff, 2004).

**Control.** Polit and Beck (2008) stated that in quantitative studies values are held in check and objectivity is sought. The practical application of this is the concept of control. Quantitative researchers implement regulating measures to attain impartiality (Cormack, 1991). Contrarily, qualitative researchers avoid restraining the phenomenon since gear shifting the incident contaminates natural occurrence (Creswell, 2007). Controlling the event leads to induced effects, and this is not the concern of a naturalist.

"Einstein never controlled a variable in his life."

Jerry Wellington, 2000

It is waggish to note that even great mathematician do experiments without controlling the variables. Evenhandedly, they are never labeled as subjective. It projects that naturalists are never wrong after all. The concept of naturalism is of high utility since in the real world things are not controlled. The more

uncontrolled the phenomenon is, the thicker is its description– plurality of reality is revealed and not forced to singularity.

**Instrumentation.** Quantitative research believed in empirical-fact discourse (Norton, 2007) and not value discourse (Williams, 1985). It has practical application in instrumentation. Empirical truth is measured using operationalized instruments. It controls the influence of values in capturing what is real and truthful. It is never the case in qualitative inquiry. The recognition of subjective truth directs divergence of instrumental strategies (Callicott, 2002; Sagoff, 2004). Instrumentation in qualitative research becomes relative to how data come in; thus, making the researcher the best instrument (Britten, 1995; Tollefson, Usher, Francis & Owens, 2001). Subjective provenance of truth can never be determined using operationalized measurement (Callicott, 2002). It does not imply that the researcher as the main instrument is subjective.

**Converging the Divide: Objectivity in Qualitative and Subjectivity in Quantitative Inquiry (Paradox).** Though qualitative researchers collect subjective data, it does not necessarily follow that data collection is automatically subjective. Objectivity in qualitative research is observed when personal biases are bracketed out from consciousness during data collection (Ray, 1985). It is when the researcher's personal values are compartmentalized so as not to influence the data collection. It is when both quantitative and qualitative converge. However, seeing it superficially, divergence occurs in the data analysis portion. Quantitative research analysis uses predetermined framework (Duffy, 1985). Qualitative inquiry considers the interpretation of the actors (Kleinman, 2004; Annels, 1999; Koch, 1995; Munhall & Oiler, 1986); making it objective. Interpretations are based from the data and how the participants interpret them (Wall, Glenn, Mitchenson & Poole, 2004; Walters, 1995; Paley, 1997). At times, it recognizes that the personal interpretation of

the researcher is equally important and must be reported (Moules, 2002; Allen & Jensen, 1990; Wilson & Hutchinson, 1991; Sandelowski, 2000; Koch, 1995; Heidegger, 1962). The aim is to provide a balance of what is from the participants and what is from the researcher (Lopez & Willis, 2006). However, one must also realize that this is not totally exclusive in qualitative research (Phillips, 1987/ 2000). In the drafting of the operational framework in quantitative research, there is personal bias or interpretation in choosing the theory and conceptualization of the theoretical framework, variables, method and measures. In providing a narrative explanation of the numerical analysis, quantitative researchers qualify using their own personal interpretation (thus subjective) in conjunction with the predetermined operationalization (which was previously constructed subjectively).

**Ethics.** In quantitative research, ethics is intermarried with the methodology (Mertens, 2010). It emphasized intellectual honesty (Jennings & Callahan, 1983). It is translated by observing the ethical principles announced in the Belmont Report (National Commission for the Protection of Human Subjects of Biomedical and Behavioral Research, 1978), which highlighted dogmatic methodologies in observing beneficence, respect and justice. Though these three are important in conducting qualitative research, Denzin and Lincoln (2008) argued that the ethical procedures designed for quantitative research must not be forced in qualitative research since it followed a different *panache*. It still observes the three basic principles but is carried differently. It had been dissected using the concept of fairness and authenticity (ontologic, educative, catalytic and tactical), and further presented explicitly via reflexivity, rapport and reciprocity.

## **XI. METHODOLOGIC ASSUMPTION**

This section is subdivided into four sub-categories: (1) process; (2) data collection and analysis; (3) measurement and discovery; and (4) sampling and generalizability.

**Matrix 4.** Process

Quantitative	Qualitative
A priori	Posteriori
Determinism (causal and associative): Product only	Relativistic: Product and process oriented
Hypothesis-testing (hypothetico-deductive)	Phenomenological in nature
Numerical and predictive nature	Narration of multiple of realities
Predetermined protocols (prescriptive)	Methods are emergent
Fixed methods and design	Flexible methodology
Reductionist (sedimented view)	Provides thick description of interpretative realities
Deductive – concept or theory to testing	Inductive (can also be abductive or retroductive) – grounded data to theory or concept: bottoms-up
Scientific	Naturalistic
It tests existing or newly created conceptualizations.	It crafts the concepts and proposes the theories or conceptualizations that are exploited to takeoff quantitative tests and predictive models.
Knowledge translated to numeric values.	Knowledge expressed narratively.
Valuable for evaluating and testing theory.	Provide academics awareness to abstract issues differently, thus establishing grounds for theoretical development, refinement and expansion.
Reductionist in nature. Answers specific questions by controlling the characteristics of sample, setting and activities. Answers only what and not why.	Seeks to provide exhaustive and comprehensive information, reconnoiters concerns and its context, and elucidates the what, how, when, where and by and among whom performances and processes maneuver while recounting unequivocal detail of the outlines and subtleties of actors, setting, activities and interactions.
Test hypothesis statistically	Pursues to categorize and explicate patterns and themes in proceedings and actors.
It is believed that before reality was controlled and converted into numerical assignments, quality was involved by understanding and interpreting the phenomenon. This provides meaning to the numbers. Additionally, the interpretations and discussions of any statistical results are of no doubt qualitative.	
Can be seen as a continuum (quantitative-qualitative continuum): Thus, the mixed method design and other integrative approaches were born.	
Can also be seen as a cycle. Conceptualizations formulated in qualitative approach are used as a framework for quantitative testing or confirmation. Falsified frameworks as a result of quantitative research are explored qualitatively and alternative or competing conceptualizations are molded.	
Alternatively, seen as a divide. The divergence between both causes the quantitative and qualitative argument. Integration may obscure the data and is a misuse of both paradigms.	

This portion talks about the methodological assumptions. Positivists utilize concepts from the natural science experimentation (Mertens, 2010).

However, postpositivist recognize rigorous application of scientific inquiry, noting that it is difficult if not impossible (Campbell &

Stanley, 1963/1966; Cook & Campbell, 1979; Shadish, Cook & Campbell, 2002). Borman and colleagues (2007) also acknowledged this limitation.

**Scientific versus Naturalistic: Hard versus Soft Science.** I claim that both are empirical. The only difference is that the quantitative inquiry upholds hard science while qualitative fosters soft science. Narrations, by logic, are empirical because it can only be perceived passing via the senses. The person undergoing the phenomenon has the empirical experience. The interpretation of the experience makes it relative. The only difference is that: (a) in quantitative research, it is the researcher who empirically experiences the phenomenon; while (b) in qualitative research, it is the participant who empirically experiences the phenomenon. Picking up the highly empirical claim of the quantitative researcher, the use of the senses for observation is readily available. However, we must not forget that the cognitive interpretation of what had been sensed does not readily follow the blueprint of the *a priori* (theoretical framework). It has to pass via the interpretative process of thinking which is highly relative. Metacognitively, both trailed similar processes packaged in different forms. Researchers must not confuse this. It takes a well-defined philosophical background to understand the convergence of both discipline and thus must not be seen as a divide.

I further argue that qualitative inquiry is scientific as long as it follows a systematic process. Devetak, Glažar & Vogrinc (2009) claimed that both, quantitative and qualitative, are scientific. Multiple triangulation technique (data, time, space, person, investigator, method, analysis and theory), an alternative to validation in qualitative research, is one of its scientific approaches (Polit & Beck, 2008). Other forms include: (a) prolonged engagement with persistent observation; (b) audit trail; (c) member check; (d) bracketing; (e) reflexivity; (f) negative case analysis; (g) peer debriefing; and (h) thick description.

**Convergence and Divergence.** It is believed

that before reality was controlled and converted into numerical assignments, understanding and interpreting the phenomenon involved quality. It provides meaning to the numbers. Additionally, the interpretations and discussions of any statistical results are of no doubt qualitative. Furthermore, this can be seen as:

**Quantitative-Qualitative Continuum.** It can be seen as a continuum. It gave birth to the mix method and design (Pearce, 2002), and other integrative approaches.

**Quantitative-Qualitative Cycle.** Conceptualizations formulated in the qualitative approach are used as a framework for quantitative testing or confirmation. As a result, falsified frameworks of quantitative research are explored qualitatively and alternative or competing conceptualizations are molded.

**Quantitative-Qualitative Divide.** The divergence between both causes the quantitative and qualitative argument. Integration may obscure the data and is a misuse of both paradigms. According to Leininger and McFarland (2005), both paradigms have different philosophies, purposes, goals, methods, and desired outcomes. They must not be observed as identical and expended in a similar manner. Mixing both infringes the philosophy, purposes, and integrity of each paradigm. Misusing mix methodology may spearhead dubious results since it may obscure the data collected (unparalleled results).

**Linearity is Only in Books and Not in Practice.** In quantitative inquiry, books suggest linear process but in actuality it is done in a nonlinear fashion (Mertens, 2010). It is similar to that in qualitative research. The only difference is that in qualitative research, this is recognized as a methodological assumption.

**Data Collection and Analysis.** The matrix below digests the difference between quantitative or qualitative research designs in terms of data collection and analysis. It is not discussed comprehensively since some of the entries are already explained previously.

Quantitative and qualitative inquiry both seek

to identify, explain and discuss patterns within and across data. Quantitative is prescriptive, fixed, nonflexible and rigid (Cook, 1991). You just need to follow the protocol and nothing goes wrong (Tewksbury, 2009). Data collection and analysis followed a prespecified operation (Cohen, Manion & Morrison, 2000). Reality is converted to numerical form and manipulated statistically to be meaningful (Gorard, Prandy & Roberts, 2002). Considering all enumerations, quantitative researches are easily verified and highly replicable (Gigerenzer, 1993). It is not the case in qualitative research. Its design and methods are

both flexible and emergent (Reichardt & Cook, 1979). Considering this, it is difficult to replicate existing methodology in an attempt to arrive in similar results (Ayer, 1946). The uniqueness of results and methods makes it hard to replicate *in toto* (Ayer, 1936; Schlick, 1959). The ontological idea of multiplicity of reality contravenes the methodological point of replication. We must remember that the philosophy talks about relateness of interpretation – between: (1) participants; (2) researchers; (3) readers; and (4) participants, researchers and readers.

**Matrix 5.** Data Collection and Analysis

Quantitative	Qualitative
Seek to identify, explain and discuss patterns within and across data.	
Non-flexible and rigid. Easy and nothing goes wrong when protocols are followed deliberately	It is often viewed as easy, but is in fact more time consuming; require greater emphasis on clarifying and defining meanings.
Downloading a data set without significant interpersonal and creative skills.	Require cerebral, interpersonal and creative abilities to organize, manage, analyze and interpret data.
Fixed and prespecified	Flexible and emergent
Analysis is based from prespecified operations.	The actual task and actions involve certain amount of ingenuity and innovation.
Independent from the one being studied	Interaction required and separatedness must be explicit
Independent from the one being studied	Positioning
It tests the concepts and analyzes data based from prespecified operationalization.	It crafts the concepts and proposes conceptualizations or theories that are exploited to takeoff quantitative tests and predictive models.
Requires counting of the object of investigation or the numeric labels to be created for meaningful variables	As much as possible does not count but describes quantity narratively
Without numbers it cannot be manipulated and patterns cannot be identified	Does not manipulate. Preserves the natural occurrence of the phenomenon being observed
Results can be verified by replicating its procedures	Results and methods are unique to each investigators and readers – thus hard to replicate <i>in toto</i>



## XII. WHICH IS HARD OR EASY?

"... quantitative methods are the line dancing approach to science. Everyone and anyone can do it, and all that seems to matter is that you get the steps right... in the right order, you will get the product ... so as long as the steps are done mechanically correct[ly], it is presumed to be well executed. Qualitative research on the other hand is the ballet-like, interpretative dance approach to science. While there are steps to be done, it is more important to produce a smooth, well-connected, emotionally infused product... does not rely on the mechanical precision... but instead focuses on how the overall product communicates a message and moves people both emotionally and intellectually."

Richard Tewksbury, 2009

In qualitative research, though often viewed by nonqualitative as easy, it is, in fact, cerebrally and emotionally challenging (Tewksbury, 2009; Ramos, 1989). It is time consuming from data collection, management and analysis. It is highly flexible and emergent (Burnard, 2008). The design and methodology, and even the domain of inquiry may change as data comes in (Ratnesar, 2005). It calls for ingenuity from conceptualization to reporting (Creswell, 2007).

**Theory, Framework and Literature Review.** Quantitative research verifies a theoretical framework: *a priori* (Polit & Beck, 2008; Bird, 2004). Qualitative research creates a theory: *a posteriori* (Bird, 2004). It means that the theoretical framework is required in quantitative research. It is not needed in a qualitative research. The theory is a product of research in qualitative whether it is a(n) (Suter, 2012): (a) adaptation of existing theory; (b) modification of existing theory; or (c) creation of new theory. Since theoretical framework is required in

quantitative research, comprehensive literature must be done (Glaser, 1978; Polit & Beck, 2008; Creswell, 2007). However, in qualitative research it is different. As much as possible, literature reviews are suspended (Glaser, 1978; Polit & Beck, 2008) until data comes. It is to avoid data contamination brought about by the influence in both data collection and analysis (Glaser & Straus, 1967; Cutcliffe, 2000; McGhee, Marland & Atkinson, 2007; Glaser, 1998). When one knows something ahead, it might influence how one ask the question during the interview and what to look for (Charmaz, 2006; Holton, 2007; Nathaniel, 2006; Heath, 2006). One might also utilize what was previously read in the analysis of data (Stern, 2007; Dey, 2007/ 1999; Glaser, 1992; McCallin, 2003). Though no one commence with a *tabula rasa* in research (Glaser & Straus, 1967; Dey, 2007, 1999) it is possible to bracket it out from consciousness (Creswell, 2007; Mertens, 2010). However, Creswell (2007) suggested that literature review prior to data collection might be necessary for: (a) grounding the philosophical stance; (b) drafting the methodology; and (c) entertaining a superficial idea on what to scrutinize. He further recommended that it must not be done extensively.

"So, not only is the tree more important than the seed from which it grows, but so too should the seed be blamed when the tree fails to thrive and provide fruit, shade and other benefits."

Richard Tewksbury, 2009

Quantitative researchers blame qualitative researchers on poor theory produced in qualitative research after it is refuted in a quantitative research. One must realize that the objective of doing quantitative research is to prove that the theory is wrong: the existence of zero relationship. We must not blame the method in qualitative research because of poorly produced theory. That is the essence of what has been quoted above. It is a poor theory that is

problematic and not qualitative methodology.

**Measurement or Discovery.** The matrix below digests the difference between quantitative or qualitative research designs in terms how data

are measured or discovered. Entries in this matrix are not explained since it is already discussed previously.

**Matrix 6.** Measurement or Discovery

Quantitative	Qualitative
Measurement is operationalized	Discovers without operationalization
Measure specific	Open discovery with multiple descriptions
Objective measurement	Relative discovery but confirmable (confirmability with participant or thru triangulation)
Statistical	Narrative
Application is wide but limited by the measured variables.	Application is contextual but is deep and comprehensive.
Products are exact measurements and values indicating descriptions, causalities or strengths of relationships.	Products are presentation of taxonomies, metaphors, creativity, explanations and development of theoretical constructs and arguments.
Can prove existence of description, causality and associations.	Cannot prove existence but proposes or argues in support of particulate manners of description and relations.
Testing descriptions, strength and persistence of associations between narrowly distinct and controlled measures based from existing parameters.	Relies on analytic descriptions thru documentation of redundant or saturated patterns and endeavoring to build an interconnected depiction of the data while emphasizing the suspension or isolation of preconceived parameters.
Works on the assumption that the investigator knows best what a concept means and can pinpoint ways to measure such concepts.	Works on the assumption that concepts are contextually dependent and interpretation is the product of the interaction between the actors, investigator and data.
Both compliments and benefits the production of knowledge.	

There are concerns under measurement and discovery, which were not discussed previously. These are:

**Non-Statistical Approaches in Positivistic Approach.** According to Ratnesar (2005), Einstein did not use statistics to develop his theories. He further added that mathematical investigation, statistics, and probability do not perform statistics to provide proof.

**Complementarity.** Though both have different presentations in terms of measurement, quantitative and qualitative studies can be seen as complementary and not divide. I will be

presenting a story to confirm the claim:

*The Four-Apple Story.* When a quantitative researcher is asked to describe four apples, the investigator says: "There are four apples." The numeric description of the apple is dependent on certain operationalized measure. It did not describe the entirety of the objects. To comprehensively describe the apple, the researcher needs to predetermine and operationalize certain measures like color, taste, texture, crunch and smell as part of the *a priori* (theoretical or conceptual framework). It can be comprehensive but can never be complete.

**Matrix 7.** Sampling and Generalizability

Quantitative	Qualitative
Sampling is based on representativeness	Sampling is based on context
Sampling is computable	Redundancy is enough
Tight sampling procedure	No agreed rule
Results must be externally valid	Results are transferable and not necessarily valid externally
Documenting the single reality that is generalizable to the entire population.	It is about attainment of understandings on the shared feature, with multiple variations, of a phenomenon and how the actors, structures and processes function in a culturally-grounded milieu.

A more holistic description can be given among qualitative researchers: "There are red and green aromatic apples; some are smooth in texture and when eaten tastes good and crunchy." What is lacking in the description are the frequency counts. It is still incomplete. Numeric descriptions also give meaning to the phenomenon. When both methods are used, a more comprehensive description is obtained: "There are four apples. Two are green, and the rest are red. The red ones are aromatic and smooth in texture, taste good and crunchy. The green ones are not." However, combining the strength of both methods can counteract its weaknesses. Description of a certain phenomenon can never be complete, and the ultimate truth can never be determined.

Matrix 7 digests the difference between quantitative or qualitative research designs in terms of selection of data to be analyzed and applicability of results to other population and setting.

Marshall (1996) claimed that picking a sample is imperative in any investigation. Quantitative researchers take a representative sample to derive a generalizable result that can be claimed by the entire population. The sample size is resolute to the optimal count essential to permit valid deductions. Larger size has a minor risk of sampling error. It is being determined using tight sampling computation. In qualitative research, values, beliefs and attitudes that constitute the staple of qualitative research are essentially

not normative in distribution. It marks normal distribution approach in qualitative inquiry inappropriate. It is significant to appreciate that the quintessence of qualitative research is its naturalistic nature. By scrutinizing tangible people in natural settings, we do not want to utilize highly controlled approaches to arrive in synthetic sequestration. Therefore, sampling must be based on context. Good sampling in qualitative research requires purposeful culling of good informants (Morse, 1991; Coyne, 1997). There is no hard and agreed rule on the number of culled sample in qualitative research (Tuckett, 2004; Rubinstein, 1994; Baum, 2000; Patton, 1990). It is usually in small counts (Miles & Huberman, 1994; Patton, 1990). It is because the prime concern is to arrive in data saturation (Patton, 2002; Ezzy, 2002; Morse, 1995) to claim transferability and not generalizability (Morse, 1999). It is also troublesome to get a big sample since it consumes more time in data analysis. Big sample leads to exhaustion and confusion. The general rule is to gather saturated data until no new redundant information can be taken (Lincoln & Guba, 1985).

### XIII. CONCLUSION

Both paradigms seek to define truth, reality and knowledge. In its quest for discovery, quantitative and qualitative inquiries are both objective and subjective – unintentionally intertwined in the process. Each way is inherently

subjective and both attempts to be idyllically objective. What knowledge is and how it is discovered, are highly relative. It is founded from the researcher's personal philosophical stances.

Both paradigms have its identifiable modes of accomplishing its objectives. By grounding oneself in philosophical stances, the researcher is guided on how reality, truth, and knowledge are seen. No single choice is perfect. It is only an attempt to capture its partiality. The divide is a continuum that treats its imperfection-not as an attempt to arrive in its ultimate form, but at least, to articulate as much coverage. The divergence as claimed by some may converge as viewed by others. The distinction between claims is equivalently logical.

## REFERENCES

- Allen, M. N., & Jensen, L. (1990). Hermeunitical inquiry: Meaning and scope. *Western Journal of Nursing Research*, 12, 241-253.
- Altheide, D. L., & Johnson, J. M. (1994). Criteria for assessing interpretive validity in qualitative research. In Denzin, N. K., & Lincoln, Y. S. (Eds.), *Handbook of qualitative research* (pp. 485-499). Thousand oaks, CA: Sage Publication.
- Annel, M. (1999). Evaluating phenomenology: Usefulness, quality and philosophical foundations. *Nurse Researcher*, 6(3), 5-19.
- Ayer, A. J. (1936). The principle of verifiability. *Mind, New Series*, 45, 199-203.
- Ayer, A. J. (1946). *Language, truth, and logic* (2nd ed). London: V. Gollancz.
- Baruch, G. (1981). Moral tales. *Journal of Sociology*, 3(3), 275-296.
- Baum, F. (2000). *The new public health*. Oxford: Oxford University Press.
- Beck, C. T. (1994). Phenomenology: Its use in nursing research. *International Journal of Nursing Studies*, 31, 499-510.
- Berg, B. (2007). *Qualitative research methods for the social sciences* (6<sup>th</sup> Ed.). Boston: Pearson Education.
- Berger, P. L., & Luckmann, T. (1966). *The social construction of reality: A treatise in the sociology of knowledge*. Wright Lane, London: Penguin Books Ltd.
- Bird, A. (2004). Kuhn, naturalism, and the positivist legacy. *Studies in History and Philosophy Science*, 35, 337-356.
- Borgdoff, H. (2009). Artistic research within the fields of science. *Sensuous Knowledge 6*. Bergen: Bergen National Academy of Arts.
- Borman, G., Slavin, R. E., Cheung, A., Chamberlain, A., Madden, N. A., & Chambers, B. (2007). Final reading outcomes of the national randomized field trial of success for all. *American Educational Research Journal*, 44(3) 701-731. Winner of the 2008 Palmer O. Johnson Award, AERA.
- Bradley, F. (1914). *Essays on truth and reality*. Oxford: Clarendon Press.
- Britten, N. (1995). Qualitative research: Qualitative interviews in medical research. *British Medical Journal*, 311, 251-253. doi:<http://dx.doi.org/10.1136/bmj.311.6999.251>
- Burnard, P. (2008). A phenomenological study of music teachers' approaches to inclusive education practices among disaffected youths. *Research Studies in Music Education*, 30, 59-75. doi:10.1177/1321103X08089890
- Callicott, J. B. (2002). The pragmatic power and promise of theoretical environmental ethics. *Environmental Values*, 11, 3-25.
- Campbell, D. T. (1956). Leadership and its effects upon the group. Columbus, OH: Ohio State University Press.
- Campbell, D. T., & Stanley, J. C. (1959). Convergent and discriminant validation by the multitrait-multimethod matrix. *Psychological Bulletin*, 56, 81-105.
- Campbell, D. T., & Stanley, J. C. (1963). *Experimental and quasi-experimental designs for research*. Chicago, IL: Rand-McNally.
- Campbell, D. T., Fiske, D. W. (1959). Convergent and discriminant validation by the multitrait-multimethod matrix. *Psychological Bulletin*, 56(2), 81-105.
- Charmaz, K. (2006). *Constructing grounded theory: A practical guide through qualitative analysis*. London: Sage Publication.
- Clark, A. M. (1998). The qualitative-quantitative debate: Moving from positivism and confrontation to post-positivism and reconciliation. *Journal of Advanced Nursing*, 27, 1242-1249.
- Clegg, J. W. & Slife, B. (2009). Research ethics in the postmodern context. In Mertens, D. M., & Ginsberg, P. E. (Eds.), *The Handbook of Social Research Ethics* (pp. 22-38). Newbury Park, CA: Sage Publication.
- Cohen, L., Manion L., & Morrison, K. (2000). Research methods in education (5<sup>th</sup> Ed.). New York:

- Routledge.
- Comte, A. (1848). *Cours de philosophie positive*. Translated by Bridges, J. H. (1965). London: Trübner & Co.
- Cook, T. D. (1985). Post-positivism critical multiplism. In Shotland, R. L., & Mark, M. M. (Eds.), *Social Science and Social Policy* (pp. 21-62). Beverly Hills, CA: Sage Publication.
- Cook, T. D. (1991). Clarifying the warrant for generalized causal inferences in quasi-experimentation. In McLaughlin, M. W., & Phillips, D. (Eds.), *Evaluation and education at quarter century* (pp. 115-144). Chicago: NSSE.
- Cook, T. D., & Campbell, D. J. (1979). *Quasi-experimentation: Design and analysis issues for field settings*. Boston: Houghton Mifflin Company.
- Cormack, D. S. (1991). *The research process*. Black Scientific: Oxford.
- Coyne, I. T. (1997). Sampling in qualitative research: Purposeful and theoretical sampling; merging or clear boundaries. *Journal of Advance Nursing*, 26, 623-630.
- Creswell, J. W. (1998). *Qualitative inquiry and research design: Choosing among five traditions*. Thousand Oaks, CA: Sage Publication.
- Creswell, J. W. (2007). *Qualitative inquiry and research design: Choosing among five traditions* (2nd Ed.). Thousand Oaks, CA: Sage Publication.
- Crossan, F. (2011). Research philosophy: Towards an understanding. *Nurse Researcher*, 11(1), 46-55.
- Crotty, M. (1998). *The foundations of social research*. London: Sage Publication.
- Cutcliffe, J. R. (2000). Methodological issues in grounded theory. *Journal of Advanced Nursing*, 31(6), 1474-1484.
- Denzin, N. K. (1989). *The research act* (3<sup>rd</sup> Ed.). New York: McGraw-Hill.
- Devetak, I., Glazar, S. A., & Vogrinc (2009). The role of qualitative research in science education. *Eurasia Journal of Mathematics, Science and Technology Education*, 6(1), 77-84.
- Dey, I. (1999). *Grounding grounded theory*. San Diego, CA: Academic Press.
- Dey, I. (2007). Grounding categories. In Bryant, A. & Charmaz, K. (Eds.), *The SAGE handbook of grounded theory* (pp. 167-190). London: Sage Publication.
- Duffy, M. E. (1985). Designing nursing research: The qualitative-quantitative debate. *Journal of Advanced Nursing*, 10(3), 225-232. doi:10.1111/j.1365-2648.1985.tb00516.x
- Ezzy, D. (2002). *Qualitative analysis: Practice and innovation*. Crowns Nest, NSW: Allen & Unwin.
- Fitzgerald, B., & Howcroft, D. (1998). Towards the solution of the IS Research Debate: From Polarisation to Polarity. *Journal of Information Technology*, 13(4), 313-326.
- Freud, S. (1993/1961). The ego and the id. In Strachey, J.R. (Ed.), *Standard edition of the complete psychological works of Sigmund Freud*. NEW York: W.W. Norton and Company.
- Friedman, M. (1991). The re-evaluation of logical positivism. *The Journal of Philosophy*, 88, 505-519.
- Gerring, J., & Thomas, C. W. (2011). Quantitative and qualitative: A question of comparability. In Badie, B., Berg-Schlosser, D., & Morlino, L. (Eds.), *International encyclopedia of political science*. Thousand Oaks, CA: Publication. doi:10.4135/9781412994163
- Gigerenzer, G. (1993). The superego, the ego, and the id in statistical reasoning. In Keren, G., & Lewis, C. (Eds.), *A handbook for data analysis in the behavioral sciences: Methodological issues* (pp. 311-339). Hillsdale, NJ: Lawrence Erlbaum Associates.
- Glaser, B. G. (1978). *Theoretical sensitivity*. CA, Mill Valley: Social Press.
- Glaser, B. G. (1992). *Basics of grounded theory analysis: emergence versus forcing*. Mill Valley, CA: Sociology Press.
- Glaser, B. G. (1998). *Doing grounded theory: issues and discussions*. Mill Valley, CA: Sociology Press.
- Glaser, B. G., & Strauss, A. (1967). *The discovery of grounded theory: Strategies for qualitative research*. Chicago, IL: Aldine Transaction.
- Gorard, S., Prandy, K., & Roberts, K. (2002). An introduction to the simple role of numbers in social science research. *Economic and Social Research Council, Teaching and Learning Research Programme, Research Capacity Building Network, Occasional Paper Series*, paper 53. Retrieved October, 18. 2012 from <http://www.cf.ac.uk/socsi/capacity/Papers/roleofnumbers.pdf>
- Guba, E. G., & Lincoln, Y. S. (1981). *Effective evaluation: Improving the usefulness of evaluation results through responsive and naturalistic approaches*. San Francisco, CA: Jossey-Bass.
- Guba, E. G., & Lincoln, Y. S. (1994). Competing paradigms in qualitative research. In Denzin, N. K. & Lincoln, Y. S. (Eds.), *Handbook of qualitative research* (pp. 105-117). Thousand Oaks, CA: Sage Publication.
- Guba, E. G., & Lincoln, Y. S. (1994). Competing paradigms in qualitative research. In Denzin, N. K., & Lincoln, Y. S. (Eds.), *Handbook of qualitative*



- research (pp. 105-117). Thousand Oaks, CA: Sage Publication.
- Heath, H. (2006). Exploring the influences and use of the literature during a grounded theory study. *Journal of Research in Nursing*, 11(6), 519-528.
- Heidegger, M. (1962). *Being and time*. Translations by Macquarrie, J. & Robinson, E. (Reprinted version 1980). Oxford: Basil Blackwell.
- Heidegger, M. (1971). *Poetry, language, thought*. New York: Harper & Row.
- Holden, M. T., & Lynch, P. (2004). Choosing the appropriate methodology: Understanding research philosophy. *The Marketing Review*, 4, 397-409.
- Holton, J. (2007). The coding process and its challenges. In Bryant, A. & Charmaz, K. (Eds.), *The SAGE handbook of grounded theory* (pp. 265-289). London: Sage Publication.
- Howe, K. R. (1988). Against the quantitative-qualitative incompatibility thesis (or dogmas die hard). *Educational Researcher*, 17, 10-16.
- Howe, K. R., & Eisenhart, M. (1990). Standards in qualitative (and quantitative) research: a prolegomenon. *Educational Researcher*, 9(4), 2-9.
- Joachim, H. H. (1906). *The nature of truth; An essay*. Oxford: Clarendon press.
- Kleinman, S. (2004). Phenomenology: To wonder and search for meanings. *Nurse Researchers*, 11(4), 7-19.
- Koch, T. (1995). Interpretative approaches in nursing research: The influence of Husserl and Heidegger. *Journal of Advanced Nursing*, 21, 827-836.
- Koch, T., & Harrington, A. (1998). Reconceptualizing rigour: The case of reflexivity. *Journal of Advanced Nursing*, 28(4), 882-890. doi:10.1046/j.1365-2648.1998.00725.x
- Kuhn, T. S. (1962). *The structure of scientific revolution*. Chicago: University of Chicago Press.
- Kuhn, T. S. (1970a). *The structure of scientific revolution* (2<sup>nd</sup> Ed.) Chicago: University of Chicago Press.
- Kuhn, T. S. (1970b). Logic of discovery or psychology of research? In Lakatos, I. & Musgrave, A. (Eds.), *Criticism and growth of knowledge* (pp. 1-23). Cambridge: Cambridge University Press.
- Kuhn, T. S. (1970c). Reflections on my critics. In Lakatos, I. & Musgrave, A. (Eds.), *Criticism and growth of knowledge* (pp. 231-278). Cambridge: Cambridge University Press.
- Kuzel, A. J., & Like, R. C. (1991). Standards of trustworthiness for qualitative studies in primary care. In Norton, P. G., Steward, M., Tudiver, F., Bass, M. J., & Dunn, E. V. (Eds.), *Primary Care Research* (pp. 138-158). Newbury Park, CA: Sage Publication.
- Laudan, L. (1977). *Progress and its problems: Toward a theory of science growth*. Berkeley, CA: University of California press.
- Laudan, L. (1996). *Beyond positivism and relativism: Theory, method, and evidence*. Boulder, CO: Westview Press.
- Leach, M. (1990). Philosophical choice. *Journal of Education*, 3(3), 16-18.
- LeCompte, M. D., & Goertz, J. P. (1982). Problems of reliability and validity in ethnographic research. *Review of Educational Research*, 52(1), 31-60.
- Leininger, M., & McFarland, M. R. (2005). *Transcultural nursing: concepts, theories, research & practice* (3<sup>rd</sup> Ed. – International Edition). New York: McGraw-Hill Medical Publishing Division.
- Lincoln, Y. S., & Guba, E. G. (2000). Paradigmatic controversies, contradictions, and emerging confluencies. In Denzin, N. K., & Lincoln, Y. S. (Eds.), *The handbook of qualitative research* (2<sup>nd</sup> Ed., pp. 163-188). London: Sage Publication.
- Lincoln, Y., & Guba, E. (1985). *Naturalistic inquiry*. London: Sage Publication.
- Lopez, K. A., & Willis, D. G. (2006). Descriptive versus interpretative phenomenology: Their contributions to nursing knowledge. *Qualitative Health Research*, 14, 726-735.
- Marshall, M. N. (1996). Sampling for qualitative research. *Family Practice*, 13, 522-525.
- Maxwell, J. (2004). Re-emergent scientism, postmodernism, and dialogue across differences. *Qualitative Inquiry*, 10(1), 35-41.
- McCallin, A. M. (2003). Grappling with the literature in a grounded theory study. *Contemporary Nurse*, 15(1-2), 61-69.
- McGhee, G., Marland, G. R., & Atkinson, J. (2007). Grounded theory research: Literature reviewing and reflexivity. *Journal of Advanced Nursing*, 60(3), 334-343.
- Mertens, D. M. (2010). *Research and evaluation in education and psychology: Integrating diversity with quantitative, qualitative, and mixed methods* (3<sup>rd</sup> Ed.). London: Sage Publication.
- Miles, M., & Huberman, A. (1994). *An expanded source book: Qualitative data analysis* (2<sup>nd</sup> Ed.). London: Sage Publication.
- Morgan, G., & Smircich, L. (1980). The case of qualitative research. *Academy of Management Review*, 5, 491-500.
- Morse, J. (1991). Strategies for sampling. In Morse, J. (Ed.), *Qualitative nursing research: A contemporary dialogue* (pp. 127-145). London: Sage Publication.



- Morse, J. (1995). The significance of saturation. *Qualitative Health Research*, 5(2), 147-149.
- Morse, J. (1999). Qualitative generalizability. *Qualitative Health Research*, 9(1), 5-6.
- Moules, N. J. (2002). Hermeneutic inquiry: Paying Heed to History and Hermes – An ancestral, substantive and methodological tale. *International Journal of Qualitative Methods*, 1(3), Article 1, 1-40. Retrieved October 18, 2012 from [http://www.ualberta.ca/~iiqm/backissues/1\\_3Final/pdf/moules.pdf](http://www.ualberta.ca/~iiqm/backissues/1_3Final/pdf/moules.pdf)
- Müller-Lyer, F. C. (1889). Optische Urteilstäuschungen. *Archiv Für Anatomie und Physiologie, Physiologische Abteilung*, 2, 263-270.
- Munhall, P., & Oiler, C. (1986). *Nursing research: A qualitative perspective*. New York: Appleton.
- Nathaniel, A. K. (2006). Thoughts on the literature review and GT. *Grounded Theory Review*, 5(2/3), 35-41.
- National Commission for the Protection of Human Subjects of Biomedical and Behavioral Research(1978). *Belmont report: Ethical principles and guidelines for research involving human subjects*. Washington, DC: US Government Printing Office.
- Norton, B. (2007). Naturalism versus non-naturalism in environmental ethics: Towards an empirical conception of sense of place. Keynote speech, joint meetings of the *International Society for Environmental Ethics and the International Association for Environmental Philosophy*. Allenspark, CO, May 29, 2007.
- Oduor, R. M. J. (2010). Research methodology in philosophy within an interdisciplinary and commercialized African content guarding against undue influence from the social science. *Thought and Practice: A Journal of Philosophical Association of Kenya, New Series*, 2(1), 87-118.
- Paley, J. (1997). Husserl, phenomenology and nursing. *Journal of Advanced Nursing*, 26(1), 187-193.
- Paley, J. (1997). Husserl, phenomenology and nursing. *Journal of Advanced Nursing*, 26, 187-193.
- Patton, M. (1990). *Qualitative Evaluation and research methods*. London: Sage Publication.
- Patton, M. (2002). *Qualitative evaluation and research methods* (3<sup>rd</sup> Ed.). London Sage Publication.
- Payne, S., Seymour, J., & Ingleton, C. (2003). Response to: Watson's guest editorial "Scientific methods are the only credible way forward for nursing research". (*Journal of Advanced Nursing*, 43, 219-220). *Journal of Advanced Nursing*, 44 (5), 546-548.
- Pearce, L. D. (2002). Integrating survey and ethnographic methods for systematic anomalous case analysis. *Social Methodology*, 32(1), 103-132.
- Phillips, D. C. (1987). *Philosophy, science, and social inquiry*. Oxford: Pergamon Press.
- Phillips, D. C. (1990). *Postpositivistic science: Myths and realities*. In Guba, E. G. (Ed.), *The paradigm dialog* (pp. 31-45). Newbury Park, CA: Sage Publication.
- Plato (360 BCE/1941). *The republic*. Translated by Jowett B. (1941). New York: The Modern Library.
- Polanyi, M. (1962). *Personal knowledge: Towards a post-critical philosophy*. London: Routledge & Kegan Paul.
- Polit, D. F., & Beck, C. T. (2008). *Nursing research: Generating and assessing evidence for nursing practice* (8th Ed.). Philadelphia, PA: Wolters Kluwer Health/Lippincott Williams & Wilkins.
- Polit, D. F., & Hungler, B. P. (1999). *Nursing research: Principles and methods* (6<sup>th</sup> Ed.). New York: Lippincott.
- Prestone, J. (2004). Bird, Kuhn, & Positivism. *Studies in History and Philosophy of Science*, 35, 327-335.
- Racher, F. E., & Robinsons, S. (2002). Are phenomenology and positivism stange bedfellows? *Western Journal of Nursing Research*, 25, 464-481.
- Ramos, M. C. (1989). Some ethical implications of qualitative research. *Research in Nursing & Health*, 12, 57-63.
- Ratnesar, N. P. (2005). The quantitative-qualitative divide and the bayesian view. *International Education Research Conference*. UWS, Parramatta.
- Ray, M. A. (1985). A philosophical method to study nursing phenomena. In Leininger, M. M. (Ed.), *Qualitative research methods in nursing* (pp. 81-92). Orlando: Grune and Stratton.
- Reichardt, C. S., & Rallis, S. F. (1994). The relationship between the qualitative and quantitative research traditions. In Reichardt, C. S., & Rallis, S. F. (Eds.), *The qualitative-quantitative debate: New perspectives* (pp. 5-11). San Francisco: Jossey-Bass Publishers.
- Reidhardt, C. S., & Cook, T. D. (1979). Beyond qualitative versus quantitative methods. In Cook, T. D., & Reidhardt, C. S. (Eds.), *Qualitative and quantitative methods in evaluation research* (pp. 7-32). Beverly Hills, CA: Sage Publication.
- Rubin, A., & Babbie, E. (1993). *Research methods for social work* (2nd Ed.). Pacific Grove, CA: Brooks/Cole.
- Rubin, A., & Babbie, E. (2001). *Research methods for social work* (3rd Ed.). Pacific Grove, CA: Brooks/Cole.
- Rubinstein, R. (1994). Proposal writing. In Gubrium, J., &

- Sanker, A. (Eds), *Qualitative methods in aging research* (pp. 67-81). London: Sage Publication.
- Sagoff, M. (2004). *Price, principle, and the environment*. New York: Cambridge University Press.
- Sandelowski, M. (2000). Whatever happen to qualitative description? *Research in Nursing and Health*, 23, 334-340.
- Sandelowski, M. (2004). Using qualitative research. *Qualitative Health Research*, 14(10), 1366-1386.
- Schlick, M. (1959). Positivism and realism. In Ayer, A. J. (Ed.), *Logical positivism* (pp.82-107). New York: Free Press.
- Schwandt, T. A. (2000). Three epistemological stances for qualitative inquiry: Interpretivism, hermeneutics, and social constructionism. In Denzin, N. K., & Lincoln, Y. S. (Eds.), *The handbook of qualitative research* (2nd ed., pp. 189-213). Thousand Oaks, CA: Sage Publication.
- Schwandt, T. A. (2002). *Evaluation practice reconsidered*. New York: Peter Lang.
- Scotland, J. (2012). Exploring the philosophical underpinnings of research: Relating ontology and epistemology to the methodology and methods of the scientific, interpretive, and critical research paradigms. *English Language Teaching*, 5(9), 9-16.
- Shadish, W. R., Cook, T. D., & Campbell, D. T. (2002). *Experimental and quasi-experimental designs for generalized casual inference*. Boston, MA: Houghton Mifflin.
- Small, M. L. (2008). Lost in translation: How not to make qualitative research more scientific. In Lamont, M., & White, P. (Eds), Report from *Workshop on Interdisciplinary Standards for Systematic Qualitative Research*. Washington, DC: National Science Foundation.
- Smith, J. K. (1983). Quantitative versus qualitative research: An attempt to clarify the issue. *Education Researcher*, 12(3), 6-13.
- Steel, D. (2005). Naturalism and the enlightenment ideal: Rethinking a central debate in philosophy of science. Retrieved October 18, 2012 from [https://www.msu.edu/~steel/Rethnk\\_Intrp\\_versus\\_Nat.pdf](https://www.msu.edu/~steel/Rethnk_Intrp_versus_Nat.pdf)
- Stern, P. N. (2007). On solid ground: Essential properties for growing grounded theory. In Bryant, A. & Charmaz, K. (Eds.). *The SAGE handbook of grounded theory* (pp. 114-126).
- Suter, W. N. (2012). Introduction to educational research: A critical thinking approach (2<sup>nd</sup> Ed). California, Thousand Oaks: Sage Publication.
- Tewksbury, R. (2009). Qualitative versus qualitative methods: Understanding why qualitative methods are superior for criminology and criminal justice. *Journal of Theoretical and Philosophical Criminology*, 1(1), 38-58.
- Tollefson, J., Usher, K., Francis, D., & Owens, J. (2001). What you ask is what you get: Learning from interviewing in qualitative research. *Contemporary Nurse*: 10(3-4), 258-264. doi:10.5172/conu.10.3-4.258
- Tuckett, A. (2004). Qualitative research sampling: The very real complexities. *Nurse Researcher*, 12, 47-61.
- Wagemans, J., Eleder, J. H., Kubovy, M., Palmer, S. E., Peterson, M. A. Singh, M. & von der Heydt, R. (2012). A Century of gestalt psychology in visual perception: I. perceptual grouping and figure-ground organization. *Psychological Bulletin*, 138(6), 1172-1217. doi:10.1037/a0029333.
- Walker, R. C. S. (1989). *The coherence theory of truth: Realism, anti-realism, idealism*. London and New York: Routledge.
- Wall, C., Glenn, S., Mitchinson, S., & Poole, H. (2004). Using a reflective diary to develop bracketing skills during a phenomenological investigation. *Nurse Researcher*, 11(4), 20-29.
- Walters, A. J. (1995). The Phenomenological Movement: Implications for nursing research. *Journal of Advanced Nursing*, 21, 791-799.
- Warren, C. A. B., & Karner, T. X. (2005). *Discovering qualitative methods: Field research, interviews and analysis*. Los Angeles: Roxbury.
- Wellington, J. (2000). *Educational research: Contemporary issues and practical approaches*. London: Continuum.
- Werkmeister, W. H. (1937a). Seven theses of logical positivism critically examined I. *The Philosophical Review*, 46, 276-297.
- Werkmeister, W. H. (1937b). Seven theses of logical positivism critically examined II. *The Philosophical Review*, 46, 357-376.
- Williams, B. A. O. (1985). *Ethics and the limits of philosophy*. Cambridge, MA: Harvard university Press.
- Wilson, H., & Hutchinson, S. (1991). Triangulation of qualitative methods: Heideggerian hermeneutics and grounded theory. *Qualitative Health Research*, 1, 263-276.
- Woodhouse, L. D., & Livingood, W. C. (1991). Exploring the versatility of qualitative design. *Qualitative Research*, 1(4), 434-445.
- Young, J. O. (2013). The coherence theory of truth. *The Stanford Encyclopedia of Philosophy*. Retrieved May 6, 2013 from <http://plato.stanford.edu/entries/truth=coherence/#Ver>