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ONTOLOGY, EPISTEMOLOGY AND AXIOLOGY IN QUANTITATIVE AND QUALITATIVE RESEARCH: ELUCIDATION OF THE RESEARCH PHILOPHICAL MISCONCEPTION

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Abstract

Even though the philosophy of science has moved somewhat away from positivism to a wider understanding of science and knowledge, there still is little agreement about defining science. Researchers are concerned about the dissertations that they were reading which had no mention of philosophy or the philosophical underpinnings of their research questions or designs. The researcher's concerns about PhD students (earning a Doctor of Philosophy degree) who never mentioned the word "philosophy" in their dissertations prompted this study. This research really wondered and wanted to know if the Philosophy of Science and Theory Development course has relevance. In a research world that supports quantitative research with a bias against qualitative designs, the research is curious about the experiences of PhD students who had experienced both the Philosophy of Science and Theory Development and Qualitative Methods of Inquiry courses. In conclusion effort was made to clarify what ontology, epistemology and axiology entail so as to have clear understanding of what the terms mean.

Keywords: *Axiology, Epistemology, Ontology, Qualitative/Quantitative Research and Research Philosophy*

Introduction

Changes in the philosophy of science occurred as the result of Thomas Kuhn's (1962) presentation and discussion of paradigm (worldview) shifts. In this concept, Kuhn noted that science moves from long periods of "normal science," through increasing occurrences of anomalies, which cause scientists to question the established paradigm. When a new alternative paradigm becomes accepted, a radical paradigm shift occurs. Kuhn calls the conversion to the new paradigm a "scientific revolution" (Kuhn, 1962 and Rowley, 2002)

Cohen, Manion and Morrison (2000) add that Kuhn makes it clear that scientific truth changes over time. Eisner (1991) notes that even though the philosophy of science has moved somewhat away from positivism to a wider understanding of science and

knowledge, there still is little agreement about defining science. Howe (1985 and 1988) believed that Kuhn had undermined the philosophy of logical positivism in 1951 when he published his findings.

Patton (2001) discusses a model for science, which sees science as pluralistic, a “collection of paradigms”. Guba and Lincoln (1994) and Orlikowski and Baroudi (1991) propose examining four paradigms; positivism, post positivism, constructivism, and critical theory and their dimensions; ontology, epistemology, and methodology. Paul and Elder (1997) discuss two important aspects of paradigms. The first is that paradigms differ in their assumptions about what is real, the nature of the relationship between the one who knows and what is known, and how the knower goes about discovering or constructing knowledge. The second is that paradigms shape, constrain, and enable all aspects of educational inquiry.

Furthermore, scholars had concerns about the dissertations that were reading which had no mention of philosophy or the philosophical underpinnings of their research questions or designs. Researchers’ concerns about PhD students (earning a Doctor of Philosophy degree) who never mentioned the word “philosophy” in their dissertations prompted this study. Scholars really wondered and wanted to know if the Philosophy of Science and Theory Development course has relevance.

In a research world that supports quantitative research with a bias against qualitative designs, researchers are curious about the experiences of PhD students who had experienced both the Philosophy of Science and Theory Development and Qualitative Methods of Inquiry courses. This paper will follow Crotty (1998) in concentrating on the relationship of ontology (theory of being/reality/essence), epistemology (theory of knowledge), and methodology (theory of method/action).

What is a Research Paradigm?

Klein and Myers (1999) stated that paradigm comes from the Greek *paradeiknyai* (to show side by side) and is a pattern or example of something. The word connotes the ideas of a mental picture or pattern of thought (Walsham, 1995). A paradigm may be viewed as a set of *basic beliefs* ... that deals with ultimate or first principles. It represents a *worldview* that defines for its holder, the nature of the “world”, the individual’s place in it, and the range of possible relationships to that world and its parts ... The beliefs are basic in the sense that they must be accepted simply on faith (however well argued); there is no way to establish their ultimate truthfulness.

Had it been this was the idea of all researchers, and then these philosophical debates would have been resolved millennia years ago because of its orderliness (Guba and Lincoln, 1994). While Hesse-Biber (2009) defines a paradigm as “a theory or hypothesis”, a paradigm is rather a framework within which theories are built, that fundamentally influences how you see the world, determines your perspective, and shapes your understanding of how things are connected. Holding a particular world view influences your personal behaviour, your professional practice, and ultimately the position you take with regard to the subject of your research. Research paradigms define

for the researcher what it is they are about as well as what falls within and outside the limits of legitimate research” (Guba and Lincoln, 1994). Research paradigm (or Research Approach) can also be seen as the collective set of attitudes, values, beliefs, procedures and techniques that create a framework of understanding through which theoretical explanations are formed.” (Trochim and Donnelly, 2006)

Classification of Research Paradigms

Guba and Lincoln (1994) state that the basic beliefs that define a particular research paradigm may be summarised by the responses given to three fundamental questions:

- The *ontological* question i.e. what is the form and nature of reality
- The *epistemological* question i.e. what is the basic belief about knowledge (i.e. what can be known)
- The *methodological* question i.e. how can the researcher go about finding out whatever s/he believes can be known.

Comparison between Research Paradigms

Below is an analysis of three major research paradigms:

Table 1: Comparison between Research Paradigms

Questions for analysing paradigms		Research paradigms		
		Positivism	Interpretivism	Critical Theory
Ontological questions	Nature of reality	- An objective, true reality exists which is governed by unchangeable natural cause-effect laws - Consists of stable pre-existing patterns or order that can be discovered - Reality is not time- nor context-bound - Reality can be generalised	- The world is complex and dynamic and is constructed, interpreted and experienced by people in their interactions with each other and with wider social systems i.e. fluid definitions of a situation created by human interaction/social construction of reality - Reality is subjective. People	Governed by conflicting, underlying structures – social, political, cultural, economic, ethnic, gender

		experience reality in different ways. Subjective reality is important i.e. what people think, feel, see) ▪ Reality can only be imperfectly grasped ▪ The use of language defines a particular reality	
Nature of human beings	▪ Rational ▪ Shaped by external factors (same cause has the same effect on everyone) i.e. mechanical model / behaviourist approach. Under certain conditions people will probably engage in a specified behaviour	▪ Social beings who create meaning and who constantly make sense of their worlds ▪ People possess an internally experienced sense of reality	▪ People can design / reconstruct their own world through action and critical reflection

	Research paradigms
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Questions for analysing paradigms		Positivism	Interpretivism	Critical Theory
Epistemological questions (cont)	Nature of knowledge	- Knowledge can be described in a systematic way - Knowledge consists of verified hypotheses that can be regarded as facts or laws. - Probabilistic – i.e. holds true for large groups of people or occurs in many situations - Knowledge is accurate and certain	- Knowledge is based not only on observable phenomena, but also on subjective beliefs, values, reasons, and understandings - Knowledge is constructed - Knowledge is about the way in which people make meaning in their lives, not just <i>that</i> they make meaning, and <i>what</i> meaning they make.	- Knowledge is dispersed and distributed - Knowledge is a source of power - Knowledge is constituted by the lived experience and the social relations that structure these experiences - Events are understood with social and economic contexts

	Role of theory	Theories are: ▪ Normative ▪ Present ‘models’ ▪ General propositions explaining causal relationships between variables	Theories: ▪ Are revisable ▪ Approximate truth ▪ Are sensitive to context	Theories: ▪ Are constructed in the act of critique in a dialectical process of deconstructing and reconstructing the world.
	Theory building/testing	▪ Postulate theories that can be tested in order to confirm or reject ▪ Prove a theory from observable phenomena/behaviour ▪ Test theories in a controlled setting, empirically supporting or falsifying hypotheses through process of experimentation	▪ Theories are built/constructed from multiple realities – the researcher has to look at different things in order to understand a phenomenon ▪ Theory is shaped by social and cultural context	▪ Theories are built from deconstructing the world, from analysing power relationships

	Role of research	▪ Uncover reality i.e. natural laws ▪ Scientifically explain/describe, predict and control phenomena	▪ Study mental, social, cultural phenomena—in an endeavour to understand why people behave in a certain way. ▪ Grasp the ‘meaning’ of phenomena ▪ Describe multiple realities	▪ Promoting critical consciousness ▪ Breaking down institutional structures and arrangements that produce oppressive ideologies and social inequalities ▪ Shift the balance of power so that it may be more equitably distributed ▪ Address social issues ▪ Political emancipation and increasing critical consciousness
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Questions for analysing paradigms	Research paradigms		
	Positivism	Interpretivism	Critical Theory

Epistemological questions (cont)	Research findings are true if:	- Can be observed and measured - Can be replicated and are generalisable	Research has been a communal process, informed by participants, and scrutinised and endorsed by others.	- Can solve problems within a specific context. - Solutions may be applied in other contexts, but as hypotheses to be tested. - Unveil illusions
	Role of common sense	None— only deductive reasoning	- Common sense reflects powerful everyday theories held by ordinary people - Iterative and inductive reasoning used	False beliefs that hide power and objective conditions

Source: Adapted from Neuman (2000)

Deductive and Inductive Reasoning

The choice between the deductive or inductive research paradigm has been discussed by a number of authors (Cavaye, 1996; Hussey and Hussey, 1997; Perry, 2001). Hussey and Hussey (1997:19) defined deductive research as “a study in which a conceptual and theoretical structure is developed which is then tested by empirical observation; thus particular instances are deducted from general influences.” Deductive research is a study in which theory is tested by empirical observation. The deductive method is referred to as moving from the general to the particular. Inductive research is a study in which theory is, “developed from the observation of empirical reality; thus general inferences are induced from particular instances, which is the reverse of the deductive method since it involves moving from individual observation to statements of general patterns or laws,” (Hussey and Hussey, 1997:13).

Cavaye (1996:236) does not exclude the combined use of both inductive and deductive approaches, saying they can “both be used in the same study.” The possibility of using both inductive and deductive approaches in the same case study has also been discussed

by Perry (2001: 307). He describes a continuum from pure induction (theory-building) to pure deduction (theory-testing). He advocates taking a middle-ground of a balance between the two, striking the position of what he calls “theory confirming/disconfirming” approach.

Difference between Deductive and Inductive Thought

Neuman (2000) stated that deductive thought includes within it the creation or designing of a theory, determining assumptions in relation to that theory and analysing those assumptions in the face of reality. This is the basis of the positivist/quantitative approach to research. The assumptions are inferred from a theory and examined in order to prove or disprove a theory. On the other hand, Neuman revealed that inductive thought begins with observation or examination of events or specific processes in order to reach wider and more general statements based on these events or processes. The assumptions are inferred from the research results (the findings) and create a theory. This is the basis of the qualitative approach to research.

Subjective and Objective Reasoning

Another significant choice which exists in the research paradigm to be adopted is the extent to which the researcher is subjective (involved in or has an influence on the research outcome) or objective (distanced from or independent) in the execution of the fieldwork (empirical work). Easterby-Smith *et al.* (1991:33) discussed the “traditional assumption that in science the researcher must maintain complete independence if there is to be any validity in the results produced.”

As outlined in Table 5.1, the phenomenological research paradigm is, by its very nature, subjective. The use of this paradigm necessarily requires involvement in both real world circumstances as well as the involvement (sometimes directly) of the researcher himself. It is accepted that such a subjective approach, as used in the research, requires the recognition of any influence or limitation such subjectivity may have on the conduct or findings of the research. What is important here is to recognise the fact that phenomenological research certainly involves a subjective approach, which should be recognised in the analysis and interpretation of the data gathered.

Table 2: Research Paradigms and Questions for Analysing Such Paradigms

Questions for analysing paradigms		Research paradigms		
		Positivism	Interpretivism	Critical Theory
Methodological questions	Role of researcher	▪ Objective, independent from the subject ▪ Investigator often controls the investigated	▪ Co-creator of meaning ▪ Brings own subjective experience to the research ▪ Tries to develop	▪ Adopts role of facilitator – encouraging the participation and involvement of the ‘subjects’ who become

			an understanding of the whole and a deep understanding of how each part relates and is connected to the whole	partners in the research process
Questions for analysing paradigms		Research paradigms		
		Positivism	Interpretivism	Critical Theory
Methodological questions (cont.)	Role of values	- Science is value-free - Values have no place in research– must eliminate all bias	Values are an integral part of social life– no values are wrong, only different	- Facts can never be isolated from values - Values of the researcher influence the research
	Methods	- Empirical - Structured and replicable observation - Quantification/ measurement - Experimental– directly manipulate variables and observe	- Unstructured observation - Open interviewing - Discourse analysis - Try to capture “insider” knowledge	- Participatory action research - Dialogical methods– which encourage dialogue between researcher and researched
	Type of studies	- Survey studies - Verification of hypotheses - Statistical analysis - Quantitative descriptive studies	Field research, conducted in natural settings in order to collect substantial situational information	

Source: Adapted from Neuman (2000)

Research Philosophical Foundation

The research philosophy addresses the beliefs, values and principles underlying a detailed study. The word *philosophy* is derived from the world of Greek, the *love of wisdom* (Cavalier, 1990). The wisdom encapsulates the essence of philosophy. It involves thinking about questions, making interpretations, trying out ideas and thinking of possible arguments for and against them and wondering how concepts really work (Ruona, 1999). It also offers a framework of thinking, helps develop capacities of thinking and improves the alignment of what an individual think and what he does (Paul, 1993 and Honderich, 1995). At the heart of it, philosophy is systematic examination of the assumptions and common wisdoms that underlies thought and action (Root, 1993). Philosophically, Cresswell (1994) identifies five sets of assumptions that are related to *what is reality/knowledge?*

- How to know it is true?(a question of ontology)
- What values go into it?(a question of epistemology)
- How to write about it?(a question of axiology)
- The process of studying it (a question of rhetoric or methodology), (Cresswell, 1994; Gioia and Pitre, 1990, and Kuhn, 1970).

It is important for researchers to recognise and understand the ontological and epistemological orientation within the research paradigm as it is able to determine the entire course of the researcher's project (Hussey and Hussey, 1997). Four schools of thought about knowledge claims are also discussed critically. They are: Idealism; Realism; Positivism and interpretivism. In realising the potential utility of philosophy, a system of thought and action needs to be considered (Berg, 2001). These philosophical knowledge claims represent a set of fundamental assumptions in relation to the world and the researcher. Denzin and Lincoln (2000) argued that the assumptions that are relevant to the research philosophy are: being (ontology); knowing (epistemology) and acting (axiology).

Some researches are located in a positivist epistemology, where no objective truth is accepted and truth or meaning generation comes through social engagement with the world (Crotty, 1998). In this regard, the investigator or researcher and the investigated or researched *object* are assumed to be independent entities, and the researcher to be capable of studying the object without influencing it or being influenced by it. In this manner, positivism can be defined as a research approach that is based on the ontological doctrine that reality is independent of the observer. In other words, a research might be within the framework of positivism's transactional and subjectivist assumption that sees knowledge as created in interaction among investigator and respondents (Paul and Elder, 1997). When influence in either direction (threats to validity) is recognised, or even suspected, various strategies will be followed to reduce or eliminate it. The axiological perspective of a research paradigm is aimed at depicting the level of consistency, reliability or otherwise reconstructing or extending the previously held theories or construction (Neuman, 1997).

Positioning Research Paradigm

It is essential to show the graphical positioning of the research paradigm. It could be shown in terms of three components of philosophical assumptions interact in a dynamic, multi-virtuous and systematic way, together forming a guiding framework for a congruent and coherent system of thought and action (Patton, 1990). This become a framework model that helps author to make sense of it and outlines the philosophical basis for the chosen research paradigm and research approach. The research paradigm should be positioned within the dotted area of the diagram of Figure 1

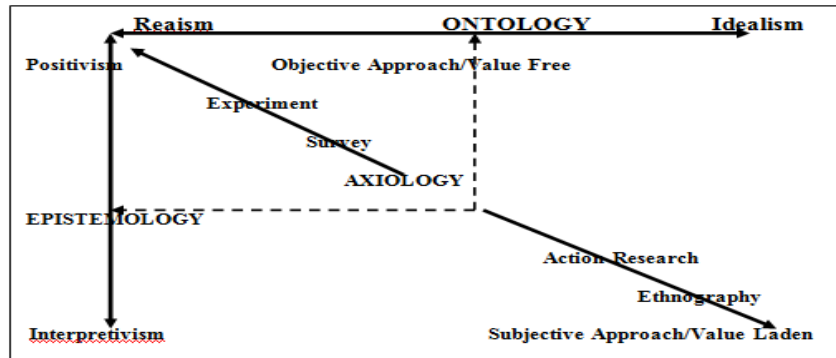


Figure 1: Positioning Research Paradigm, (Sexton, 2003)

Figure 1 above shows the interactive and dynamic relationship among the key components integral to philosophical framework (Lee, 1991). It elucidates the connections: demonstrating on how one *sees and views* the world and reality (ontology) and how one *thinks* about the world (epistemology) and how one *acts* in the world (axiology). This reflects and influence how one *thinks* about and consequently *sees* the world that helps one to *act* in inquiry and practice within the ontological and epistemological orientations. In other words, axiology urges congruence between ontological and epistemological assumptions (Mittman, 2001). It plays an important role in putting the standards and requirements of acceptable research approach and research techniques for this research. Making the axiology explicit helps to set and clarify the guiding tone and rigour for action in research.

Summary of Positioning Research Paradigm

The positioning of research paradigm as illustrated in Figure 2 above could be summarised as follows:

- a) **The Ontological Question:** The ontological question is- What is the form and nature of reality and therefore, what is there that can be known about? Some researches favour more towards realism (Ting-Toomey, 1984, Lincoln and Guba, 1985). This is because the nature of this research is to seek understanding whether intangible location attributes influence the values of residential properties and meanings via not human interactions (Ghauri and Kjell, 2005). This means that some research treat the

phenomenon under study as an independent and single reality. In other words, it does not accept the knowledge claims by understanding different respondents' interpretation given to the reality. For example, if a *real* world is assumed, then what can be known about it is *how things really are* and *how things really work* (Robson, 2002). Then only those questions that relate to matters of *real* existence and *real* actions are admissible; other questions, such as those concerning matters of aesthetic or moral significance, fall outside the realm of legitimate scientific inquiry and therefore they are not considered in some research.

- b) **The Epistemological Question:** The epistemological question in- What is the nature of the relationship between the knower and would-be knower and what can be done? The answer that can be given to this question is constrained by the answer already given to the ontological question, that is, not just any relationship can now be postulated (Paul, 1993). Looking at research, it could be realised that it favours more towards positivism. In other words, the nature of some research is not rooted in the notion of *lived-world experience* (Hirschheim, 1985). The research also acknowledges that the knowledge is not socially constructed through interpretation of different estate surveyors and valuers as well as respondents who are involved in the research.
- c) In a more concise and precise way, research does not intend to explore the explanations of the perceptions and actions of different respondents who are directly involved in examining reality, but by understanding the way in which they comprehend their world (Hirschheim, and Klein, 1989). So if for example, a *real* reality is assumed, then the posture of the knower must be one of objective detachment or value freedom in order to be able to discover *how things really work*. Conversely, assumption of an objectivist posture implies the existence of a *real* world to be objective about (Morgan and Smircich, 1980).
- d) **The Methodological (Axiological) Question:** The axiological question in this regard is: How can the inquirer (would-be knower) go about finding out whatever he or she believes can be known? Again, the answer that can be given to this question is constrained by answer already given to the first two questions, that is, not just any methodology is appropriate (Morgan, 1998). Some researches favour more towards objective approach or value-free nature of research. The phenomenon under study is not interpreted within a context through direct interaction within the different levels of critical thinking.

Consequently, the researcher's perception is highly objective and is not filtered through his own understanding which is modified and evolved as more understanding accumulated over time (Easterby-Smith et al., 1991) For example, a *real* reality pursued by an objective inquirer mandates control of possible confounding factors, whether the

methods are qualitative (say observational) or quantitative (say, analysis of covariance). Conversely, selection of a manipulative methodology implies the ability to be objective and a real world to be objective about. The methodological question cannot be reduced to a question of methods; methods must be fitted to a predetermined methodology (Miles, and Huberman, 1994).

Based on the philosophical research assumptions as discussed above, a research paradigm should be within the value-free and objective nature of a research supports the adoption of the positivist research paradigm rather than interpretivism research paradigm that seeks subjective knowledge. Positioning research paradigm within the context of issues under investigation that focuses on critical thinking justifies the choice of research paradigm and techniques. These are further discussed below in figure 2

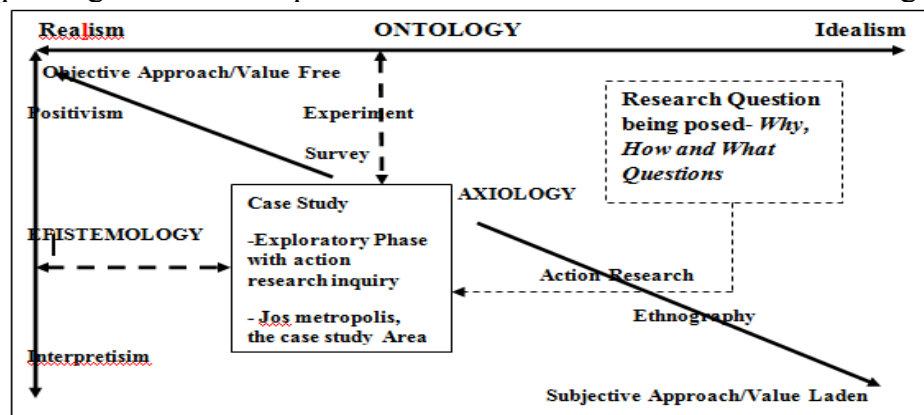


Figure 2: Positioning Research Paradigm and Research Approach, (Sexton, 2003; Yin, 2003 and Kasim et al, 2006)

What is Ontology?

In philosophy, ontology is the study of being or existence. Ontology is a specification of a conceptualization (Tashakkori and Teddlie, 2008). The subject of ontology is the study of the categories of things that exist or may exist in some domain. The product of such a study, called ontology, is a catalog of the types of things that are assumed to exist in a domain of interest. Ontology is the theory of objects and their ties (Strauss and Corbin, 1998). Ontology provides criteria for distinguishing various types of objects (concrete and abstract, existent and non-existent, real and ideal, independent and dependent) and their ties (relations, dependences and predication). It is used to reason about the objects within that domain (Strauss and Corbin, 1990). Ontology is not a subjective science as Kant does not describe it nor "an inferential Psychology", as Hamilton regards it nor yet a knowledge of the absolute (theology); nor of some ultimate reality whether conceived as matter or as spirit, which Monists suppose to underlie and produce individual real beings and their manifestations.

According to Sale, Lohfeld and Brazil (2002), ontology (the "science of being") is a word, like metaphysics, that is used in many different senses. It is sometimes considered to be identical to metaphysics, but researchers prefer to use it in a more specific sense, as

that part of metaphysics that specifies the most fundamental categories of existence, the elementary substances or structures out of which the world is made (Rosenau, 1992). Ontological analysis clarifies the structure of knowledge. Given a domain, its ontology forms the heart of any system of knowledge representation for that domain. Without ontology, or the conceptualizations that underlie knowledge, there cannot be a vocabulary for representing knowledge....Second, ontology enable knowledge sharing." Ontology as a branch of philosophy is the science of what is, of the kinds and structures of the objects, properties and relations in every area of reality. In this sense is often used in such a way as to be synonymous with metaphysics. In simple terms it seeks the classification of entities (Reason and Bradbury, 2001).

Ontology is the term referring to the shared understanding of some domains of interest, which is often conceived as a set of classes (concepts), relations, functions, axioms and instances (Perry, 1995). Now in knowledge representation community, the commonly used or highly cited ontology definition is from Paul and Elder (1997): "ontology is a formal, explicit specification of a shared conceptualization. 'Conceptualization' refers to an abstract model of phenomena in the world by having identified the relevant concepts of those phenomena. 'Explicit' means that the type of concepts used, and the constraints on their use are explicitly defined. 'Formal' refers to the fact that the ontology should be machine readable. 'Shared' reflects that ontology should capture consensual knowledge accepted by the communities (Polgar and Thomas, 2005).

Ontology is a complex multi-disciplinary field that draws upon the knowledge of information organization, natural language processing, information extraction, artificial intelligence, knowledge representation and acquisition. Ontology, which etymologically means "speaking of being", is the philosophical discipline that asks "what is?" and "what does it mean to be" (Perry, 1998). It researches the fundamental questions of being, and thus, in everyday parlance, one could say that it studies the nature of reality. Ontological assumptions form one of the most important building blocks of our worldview and they are so fundamental that we rarely question them. They are therefore of central importance to any research in any discipline (Olsen, 2004). One needs to know what is or what exists in order to research it.

Ontology, which etymologically means "speaking of being", is the philosophical discipline that asks "what is?" and "what does it mean to be" (Newman and Benz, 1998). It researches the fundamental questions of being, and thus, in everyday parlance, one could say that it studies the nature of reality. Ontological assumptions form one of the most important building blocks of our worldview and they are so fundamental that we rarely question them. They are therefore of central importance to any research in any discipline (Neuman, 1997). One needs to know what is or what exists in order to research it.

There are profoundly different ontological theories, which in this paper will be called ontologies used by different individuals (Miller and Crabtree, 1999). This paper will argue that the concept of positivism can be defined primarily in terms of its ontological assumptions and that ontological questions are at the basis of many of our

epistemological and methodological differences. There are numerous questions of importance to be found in the history of ontology. The paper will concentrate only on the question whether reality is independent of the observer or not (Miles, and Huberman, 1994).

Grounded Theory

Merriam (1998) stated that grounded theory is “an inductive, theory discovery methodology that allows the researcher to develop a theoretical account of the general features of a topic while simultaneously grounding the account in empirical observations or data” (Merton and Coleman, 1979). A major purpose of grounded theory is to begin with the data and use them to develop a theory. Applied to our research context, grounded theory provides a set of procedures to gathering data, here: information about conceptions of individual actors, and constructing a theoretical model from them, here: ontology as a socially accepted language to communicate these conceptions. Strauss and Corbin (1998) argue correspondingly that grounded theory studies typically examine people’s actions and interactions. A major premise of grounded theory is that contextual complexities and particularities need to be incorporated into an understanding of a particular phenomenon (Orlikowski and Baroudi, 1991). Grounded theory is a research method that seeks to develop theory that is grounded in data systematically gathered and analysed. It suggests that there should be a continuous interplay between data collection and analysis.

Unlike scientific empirical research aiming at verification of ‘grand theories’ and placing little value on their discovery, grounded theory emphasises the process of discovery and places value on generating meaningful theories. While empirical research produces ‘etic’ theory by an outsider who is uninvolved and removed from the object of inquiry, grounded theory is ‘emic’ with an insider view of the people, groups, organisations or cultures being studied (Marshall and Rossman, 1989).

Non-Empirical and Empirical Research

Non-Empirical Research

One of the first considerations to be faced is the pre-existing body of knowledge that exists in a particular field (Lee, 1991). This should be used as a source of reference for research previously conducted in the chosen field of enquiry, as well as a source of the body of theory which pertains to the selected subject area. Some research depends entirely upon this research method (more generally known as searching and reviewing the literature) on a certain subject, where the subject may be one, for example, of a historical nature which does not lend itself to any other form of investigation (Kaplan and Duchon, 1988).

Empirical Research

According to Hussey and Hussey (1997), “four different types of research purpose exist: exploratory, descriptive, analytical or predictive.” Whatever the purpose of the research, empirical evidence is required. They define empirical evidence as, “data based on observation or experience.” This understanding of the importance of gathering empirical

data by observation or experience is also identified by Easterby- Smith *et al.* (1991). They use the term *fieldwork* which they say is the study of real Phenomena or social settings, and that this research may use positivist or phenomenological methods.

Qualitative and Quantitative approach

Qualitative research is a research that produces findings not arrived at by means of statistical procedures or other means of quantification (Hughes, 1990). Qualitative data can be collected through *interviews*, *focus groups*, *observation*, or review of documents. On the other hand, quantitative research is research that produces data that can be statistically analysed and whose results can be expressed numerically. Surveys using structured questionnaires and IQ tests are both examples of quantitative research (Huberman and Miles, 2002). Another choice was whether to adopt a quantitative or qualitative approach, or some mix of the two. Many authors (Cavaye, 1996; Darke *et al.*, 1998; Hussey and Hussey, 1997; Lee, 1991; Miles and Huberman, 1994; Myers and Avison, 2002) have commented on the choice between qualitative and quantitative methods in fieldwork (empirical) research.

Myers and Avison (2002) distinguished between qualitative and quantitative research methods: “Quantitative research methods were originally developed in the natural sciences to study natural phenomena. Examples of quantitative methods now well accepted in the social sciences include survey methods, laboratory experiments, formal methods (e.g. econometrics) and numerical methods such as mathematical modelling. Qualitative research methods were developed in the social sciences to enable researchers to study social and cultural phenomena. Examples of qualitative methods are action research, case study research and ethnography.

Qualitative data sources include observation and participant observation (fieldwork), interviews and questionnaires, documents and texts, and the researcher’s impressions and reactions,” (Myers and Avison, 2002). The selection of a qualitative approach also fits well with Hussey and Hussey’s views (1997) who defined qualitative research as, “a subjective approach which includes examining and reflecting on perceptions in order to gain understanding of social and human activities.” The table below shows the differences between qualitative and quantitative research.

Table 3: Features of Qualitative and Quantitative Research

Qualitative

Quantitative

All research ultimately has a qualitative grounding- Donald Campbell

There is no such thing as qualitative data. Everything is either 1 or 0- Fred Kerlinger

The aim is a complete, detailed description

The aim is to classify features, count them, and construct statistical models in an attempt to explain what is observed.

Researcher may only know roughly in advance what he/she is looking for.

Researcher knows clearly in advance what he/she is looking for.

Recommended during earlier phases of research projects.

Recommended during latter phases of research projects.

The design emerges as the study unfolds

All aspects of the study are carefully designed before data is collected

Researcher is the data gathering instrument.

Researcher uses tools, such as questionnaires or equipment to collect numerical data.

Data is in the form of words, pictures or objects

Data is in the form of numbers and statistics.

Subjective- individual's interpretation of events is important, e.g. , uses participant observation, in-depth interviews etc

Objective- seeks precise measurement and analysis of target concepts, e.g. , uses surveys, questionnaire etc

Qualitative data are more "rich", time consuming, and less able to be generalized.

Quantitative data are more efficient, able to test hypotheses, but may miss contextual detail.

Researcher tends to become subjectively immersed in the subject matter.

Researcher tends to remain objectively separated from the subject matter

Source: Adapted from Neuman (2000)

The research design or strategy alternatives are many. According to a number of authors (Cavaye, 1996; Darke *et al.*, 1998; Hussey and Hussey, 1997; Newman, and Benz, 1998; Miles and Huberman, 1994; Glock, 2007) they include alternatives such as the creation of an experiment (common in pure scientific research); surveys (often used where large volumes of data are involved with quantitative methods of analysis); grounded theory (where the theory is generated by the observations rather than being decided before the study); ethnography (a phenomenological methodology which stems from anthropology, which uses observed patterns of human activity); action research (where the research takes more of the form of a field experiment); modelling (where particular models are developed as the focus of the research activity); operational research (which looks at activities and seeks to understand their relationship, often with particular emphasis on operational efficiency), and, finally, case studies (which seek to understand social phenomena within a particular setting).

Phenomenology

Phenomenology is an ambiguous term because it can refer to a general first-person description of human experience or, more specifically, to a philosophical method for analysing consciousness developed by Edmund Husserl (Glesne and Peshkin, 1992). The

term has been used by Kant and Hegel, but Husserl redefined it in reaction to the detached academic discussion in philosophy in the 19th century. Heidegger, the possibly most important phenomenologist, defines the term "phenomenon" using its Greek etymology as "that which shows itself in itself, the manifest" (Glassner, and Moreno, 1989; Glassner and Strauss, 1967) Heidegger sees phenomenology as an ontology but it can also be understood as an epistemology.

The central idea of phenomenology is that the world is opened up by consciousness (James, 1979). Every perception is a conscious act. Phenomena are given to consciousness and phenomenology tries to go back to the things themselves. These things are not objectively given things, but rather the content of consciousness (Glaser, 1992). The phenomenologist tries to bracket out the non-essential aspects of perception to end up with the essence of the phenomenon. In phenomenology the essences of the objects of research cannot be divided from the subject who researches them. The classical subject-object dichotomy of empiricism is not valid here (Gioia and Pitre, 1990).

Empiricism

Among the different ways of acquiring knowledge and defending the claim for truth, the most prominent one is probably empiricism. Empiricism can be defined as the "doctrine that experience rather than reason is the source of our knowledge of the world" (Giddens, 1974). Empiricism is the traditional epistemology of the natural sciences (Weber, 2004) where its adherents usually search for causal relationships. Empiricists try to discover the laws governing reality and use a hypothetic deductive approach (Ting-Toomey, 1984). Empiricists set up hypotheses which they then try to prove or falsify (Stenbacka, 2001). The ultimate aim of empiricist research is to be able to make well-founded predictions (Orlikowski and Baroudi, 1991; Sexton, 2003) Empiricism is closely associated with several assumptions about the nature of scientific inquiry. First, it holds that observation is objective (Klein and Myers, 1999) and value-free (Walsham, 1995). It is also seen as a universally valid approach to knowledge which means that it is often associated with calls for a unity of science which would include the natural sciences as well as arts, humanities, and social sciences. Objectivity can be assured through an observer who is detached from the object of observation and who does not interfere (Ghauri and Kjell, 2005; Yin, 2003). An important ingredient to this of approach to academic inquiry is a certain kind of detached and aloof rationality which is interested in relationships without being intimately involved in them (Walsham, 2006).

Root (1993) revealed that as a reaction to the perceived weaknesses of empiricism, which includes the problem of the possibility of objectivity in social science, the question of appropriateness of empirical observation of humans, the alleged circularity of empiricism, the complexities of the notion of causality, a resistance to the underlying rationality, and other problems, other epistemological approaches have been developed (Robson, 2002). The most frequently quoted alternative to empiricism in philosophy is rationalism, which is the doctrine of the reason, instead of sensation, is the foundation of knowledge.

Truth Theories

The question when a statement is true is addressed by theories of truth (Frankfort-Nachmias and Nachmias, 1992). There are at least four major types of such theories using different criteria for determining the truth of a proposition: correspondence, consensus, coherence, and pragmatist. The correspondence theory of truth holds that a statement is true if it corresponds with the reality it describes. This is probably closest to our everyday understanding of truth (Feldman, 2003) and assumes an objectively given describable reality. Proponents of consensus theories believe that truth is defined by the agreement of those who are knowledgeable in the area in question (Downey and Ireland, 1983).

Coherence theories hold that statements are true if they can be supported in a formal system of statements. Typical examples of this are mathematical theorems (Donnelly and Trochim, 2005). Pragmatist theories hold that those statements are true, that fulfill their purpose, which leads to desirable outcomes (Denzin, 1997). These different theories of truth are of highest importance for any research, because they determine what can count as a successful attempt to produce truth and thus knowledge. They also indicate ways in which knowledge can or must be acquired. Differences in the underlying truth theory lead to problems in appreciating why a piece of research may be considered valuable. This leads to the second problem of knowledge, the question when a belief is justified (Crocker and Algina, 1986).

Hermeneutics

Hermeneutics is another alternative to empiricism as a way of acquiring knowledge. Etymologically, it is derived from the Greek word for "to interpret" (Cook and Reichardt, 1979). The original purpose of hermeneutics was the understanding of religious texts, more specifically of the bible. It has developed into a general approach to the understanding of texts. The underlying problem is that every reader of a text has a different understanding of that text depending on his or her own experiences and life world (Creswell, 2003). This understanding differs from the understanding of the author. Originally, hermeneutics tried to find ways of determining the true sense of the text as intended by the author (or God). Hermeneutics has moved away from the idea of such a "correct" understanding and has expanded into the art of understanding all communication, not just written text.

One important aspect of contemporary hermeneutics is the hermeneutic circle. The idea behind this is that there is a circular relationship between the prior knowledge of a recipient of a text and her understanding of the same text. A text can only be read if the reader has a general understanding of its content but this understanding will be modified through the reading of the text (Bryman, 1984). The current version of hermeneutics was explicitly developed to counter the natural science approach to humanities and social sciences. The opposition to natural sciences can best be demonstrated by looking at a pair of concepts associated with the German words *erklären* und *verstehen* (Coffey, 2002). *Erklären*, literally "to explain" refers to the natural sciences where causal relations can be established which can be used to explain phenomena. Such causal explanations are not

useful in the humanities and social sciences because they negate the ability of agents to act.

An explanation of human actions is thus not an application of natural laws but rather a description of humans that allows the reader to understand what the agent did and why she did it (Brannen, 1992). This is what *verstehen*, literally "to understand" will achieve. Hermeneutics aims at facilitating this understanding. In hermeneutics, there can be no unity of sciences. Social and natural sciences have different research objects and thus need different epistemologies (Cavalier, 1990). According to this description of hermeneutics, the role of the researcher must be different from that in empiricism. The researcher cannot be detached and needs to admit that his or her understanding of the situation affects the outcome of the research (Denzin and Lincoln, 2000).

A final remark on the relationship between hermeneutics and phenomenology: In its current form hermeneutics has been shaped by phenomenology (Bergman, 2008). The most important hermeneutic philosophers, among them Gadamer and Ricoeur, were strongly influenced by phenomenology. If the phenomenon in question is a social one, then a phenomenological researcher needs to acquire an understanding of the social exchange that constitutes it. For this, the researcher must apply hermeneutic means. He or she must follow the hermeneutic circle by starting with a given understanding, engaging with the phenomenon and thereby changing the initial understanding (Berg, 2001).

Methodology (Axiology)

While epistemology deals with the question what knowledge is, methodology asks how valid knowledge can be acquired. Methodology is thus the study of methods (Stenbacka, 2001), and it analyses the different methods used in research. There are numerous attempts to collect and classify research methods. Babbie (1998), for example, identifies thirteen. The most important divide between methods is that between quantitative and qualitative methods. There has been an intensive discussion between proponents of the two sides for at least the last 20 years. The interesting question in this paper is whether research methodologies have a clearly defined relationship to the ontology upon which the research is based (Olsen, 2004). Again, there are typical combinations between methods, epistemologies and ontologies, which are not always necessary.

Positivists using a correspondence theory of truth and an empiricist epistemology will often use quantitative methods. However, there is no fundamental reason why they could not use qualitative methods (Rosenau, 1992). In order to find out the reality of a social phenomenon and to describe it as it objectively is, it may be helpful to observe agents or interview them, to write "realist tales" (Trochim and Donnelly, 2006). On the other hand, there is the typical combination of constructionist ontology, consensus theory of truth, hermeneutic/phenomenological epistemology and qualitative methods. Again, there is on *a priori* reason, however, why quantitative methods should not be used here. Numbers and statistics can be seen as ways of clarifying meanings and shared realities (Merriam, 1998). A related question of interest is whether different research methods can be combined, which is usually discussed under the heading of "multi method" research or

"pluralist research" (Huberman and Miles, 2002; Ghauri and Kjell, 2005; Bergman, 2008). This is a question on which the discussion of positivism versus non-positivism has a profound influence and to which we will return later.

Conclusion

The paper has explained the paradigm in terms of ontology (our assumptions about the nature of being/reality), epistemology (our assumptions about the nature of knowledge and knowing) and methodology (our consequent approach to problem solving and inquiry strategy). There is an urgent need to revisit our view of ourselves as co-inhabitants of the planet. As many of us have asserted, with greater or lesser degrees of concern, the current western worldview has come to the end of its useful life, and, as well as some remarkable achievements in material well-being and human possibility, has left us with a legacy of human alienation and ecological devastation. Deconstructive postmodernism has supplied an invaluable critique of the grand narrative of modernism, but paradoxically can be seen as part of this narrative in its exclusive concern for "text" and its denial of the body.

Constructivism is an incomplete and unsatisfactory response, for the reasons that have been discussed above. The participatory worldview, with its emphasis on the person as an embodied experiencing subject among other subjects; its assertion of the living creative cosmos people co-inhabit; and its emphasis on the integration of action with knowing is more satisfying. To return to Ogilvy's terms it responds creatively to the emerging mood of these times, overturns the mechanical metaphor which underpins positivism, provides models for action inquiry and above all offers humanity a more satisfying myth by which to live.

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