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Toward Science of Qualities in Research

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Abstract: ***The challenge of teaching and practising research methodology to students has been well experienced by many educators. Students and some educators are fixated with research which adhere to quantitative approach as if it is linked to be more scientific compared to qualitative approach. This article discusses on the choice of approach of any research conducted and the ultimate purpose of the research.***

Keywords: Research, Quantitative, Qualitative, Science

Scenario

In Research Methodology Class,At the end of lecture I asked my students "which is better quantitative or qualitative method?" Few students concluded that since science is about being objective, quantitative method is better than qualitative. Consequently, I posted them with two other questions. Is "human" objective or subjective? Second, what is the purpose of doing research? Consequently, there was an excellent discussion on this topic and this affects me to write this paper not as an instructor but as a student when I had the similar thinking as them.

1. Introduction

The majority of social scientist has preferred quantitative method over qualitative. They argued quantitative method provides more "science" to their research.An article that really discussed this issues is Reason and Goodwin (1999) article which focuses on the Science of Qualities. Many questionsarise after reading the article such as "What is science and logic?" or "What are qualities and quantities, postulates which is better?" even better "Are moving forward by focusing on backward?" or the ultimate question "Should researchers even believe Reason and Goodwin after all?". Many questions but there is only one answer for all these questions, in which it will be discussed in the conclusion section.

Knowledge is the Fundamental

Reason and Goodwin (1999) argued that, the principles of complexity theory lead us toward a science of qualities in organization and social research. They have argued that qualitative research actually "expresses" wide coverage of knowledge compared to quantitative research. Research is not always about figures, mathematical formulas, computer generated results, clear state of rule, mechanistic approach, and treating humans as robot. These are the main goal of research; is to find knowledge and this knowledge to be used to enlighten mankind. Having knowledge about something is important because, knowledge will initiate research.

Human Behaviour and Quantity

Next the discussion about human - "what is human?" Believing there wouldn't a single definition that could clearly define human, how could research conclude human experience and behaviour can be quantified. It would be embarrassing to know that one human has less emotion that another or another has more than the other. In perspective, three husbands were tested how much they love their wife. Each of them scored 60 percent, 70 percent and 80 percent respectively in the love "scale". Can the researcher conclude that 80 percent score is better that 60 percent or 70 percent score? It would be preposterous for anyone to conclude in such manner. Does numbers (quantity) represents human behaviour?

Quantity is just symbolic, it is a figure. The question is why qualitative research always been sided as second grade research? In the article there is one interesting (actually there are many) which is worth mentioning. Lorentz (1963, 1991) postulated metaphorically that *a butterfly flapping its wings in Iowa could leas, via the strange dynamics of the weather, to typhoon in Indonesia*. Okay, this sounds really absurd but the word "String Theory" or "Chaos Theory" should ring the bell.

> ***String Theory, sometimes called the Theory of Everything, is thought by some to be the unifying field theory Einstein sought before his death. String theory is the first mathematically sound theory that reconciles the world of the infinitesimally small, with the world we know at large.....Because these tiny vibrating strings are responsible for the properties of all matter, the cosmos has been likened to a cosmic symphony of superstrings. While poetically appealing, the strength of string theory is that it accounts for all four known forces in one elegant theory. These fundamental forces are gravity; the strong and weak nuclear forces; and electromagnetism... (Kaku, 2011)***
>
> ***Okay, it is disturbing yet intriguing, yet Chaos Theory would postulate a better explanation on the butterfly.***
>
> ***Chaos theory attempts to explain the fact that complex and unpredictable results can and will occur in systems that are sensitive to their initial conditions. A common example of this is known as the Butterfly Effect. It states that, in theory, the flutter of a butterfly's wings in China could, in fact, actually affect weather patterns in New York City, thousands of miles away. In other words, it is possible that a very small occurrence can produce unpredictable and sometimes drastic results by triggering a series of increasingly significant events (Lorentz, 1991)***

Now, things make sense "butterfly effect" after all is not multifarious it totally fits science, well if the science would accept chaos theory. But, the word that really should be considered is actually 'complex" or "complexity". The world or human is just too complex, yet science is trying to fit in mathematical formula as suggested in string theory. As this technique is known as quantitative science that reduces the world to just numbers. Subsequently, the belief would be every human behaviour is can be calculated, every future events can be predicted and everyone in the world is just a part of equation.

Hence, Reason and Goodwin (1999) have suggested that social research or complexity theory to account for organization. Stacey (2007) in his book *Strategic Management and Organisational Dynamics (The Challenge of Complexity)*suggested the ideawhich is challenging what most organizational theorists and practitioners have come to regard as self-evident; that is, that organizations are multi-layered *systems* of individuals, teams, departments and so on. And this critical evaluation of systems thinking is applied as forcefully and insightfully to those theories that view organizations as complex adaptive systems (based on the 'mainstream' interpretation of the complexity sciences) as it is to those that emanate from the more conventional schools of strategic management. Therefore, organization is characterized by bounded instability ad spontaneous self – organization and emergent order. Thus, the quantifying organization research wouldn't be a good solution but a qualitative research would fit the bill because of the complexity of the organization. *Nevertheless, this requires management researches to be conducted in rigid-less method.*

Quality and Progressive Science

Additionally, the idea of positivist and non-positivist also must be discussed in this review. Positivist and non-positivist view can be summarized as in the table below.

Table 1: The perspective between positivist and non-positivist

	Positivist / Conventional	**Non-Positivist / Constructivist**
Ontology (nature of reality)	Reality is tangible, exists outside me, is objective, and can be broken into parts; "Truth" exists and can be apprehended and measured.	Reality is constructed, subjective, multiple, relative. Constructions are not more or less "true," only more or less informed.
Epistemology (nature of knowledge)	The knower and the known are independent of each other; the influence of the researcher on the researched can be controlled; replicable findings are "true".	Knower and the known are interactively linked; findings are "created" as research proceeds.
Axiology (role of values)	Inquiry is objective and thus value-free; values and biases can be eliminated through the use of rigorous procedures.	Inquiry is value-bound; values are inherent in the context of the study; the researcher's values affect the study.

(Adapted from courses.worldcampus.psu.edu)

The research paradigm should be moving towardsnon-positivist or constructivist method as it is more exampling the qualitative method. It is impossible, to separate the element of subjectivity in social science research, humans (both researcher and respondent) are subjected to emotion factors. It will be "senseless" literally to assume social science is objective. One main reason why quantitative research is profound preferred by research because of *parsimony*-simplicity. It is much easier to conduct quantitative research because it allows to scale human response on the Likert scale of one to five (strongly disagree to strongly agree) as qualitative research might require some determined effort for the researchers.

Furthermore, being a researcher it quite difficult to be etic (non-participate) rather being emic (to participate). It quite tough for a researcher not to get involve in own research, it is not possible to be both professional and engaging in research. It all depends how researcher wants to be in their research. It is acceptable to subjective to reach objectivity of the research.

Before discussing further on the theory of complexity, let's define scientific method. Cooper and Schindler (2006) define scientific method as systematic, empirically based procedures for generating replicable research, include direct observation of phenomena, clearly defined variables, methods and procedure; empirically testable hypotheses; the ability to rule out rival hypotheses and statistical rather than linguistic justification of conclusion. Another definition, Science has nothing to do with the quest for certainty or probability or reliability, it is merely a capability of being falsified with empirical observation (Popper in Velasquez, 2002 pg.408). Looking at the definitions, science seems to both qualitative and quantitative.

Moving on, Reason and Goodwin (1999) have suggested six dimensions of complexity theory (science of qualities). The six dimensions are rich interconnections, iteration, emergence, holism, fluctuations and edge of chaos. Rich interconnections basically is the touchstone of science of qualities. It explains that the knowledge in sciences of qualities is experiential or participative knowing. Shotter (1993) argued the "knowing of the third kind" only arises through relational engagement: a deep and intimate sense of connection is sought with the phenomena being studied. This certainly requires the researcher to be subjective (qualitative) rather being objective (quantitative).

Second dimension iteration; the procedure in which repetition of a sequence of operation yields results success closer to a desired result. According to Shotter (1993) a relationship emerges over time through the process of action and interaction. Many qualitative research focus iteration cycle as research supposed to be action orientated. Research is supposed to be iterative cycle of data-gathering and sense making, or action and reflection hence, science is being subjective. Reason and Goodwin (1999) suggested that iteration process of research cycle moves people away from linear cause and effect thinking into a cyclical and ecological mode. The elements in the world are a cycle not definite. Every natural processes happens in cycle – rain, day, night, time, birth, death, management process, organization performance and list goes on. Certainly, it is tough to be objective in research.

Third dimension is emergence; the act or an instance. Well, in personal stance science shouldn't predict but it should explain. In science of qualities, a complex system such as organization is not predictable from the characteristics of the interconnected components or from any design blueprint (Reason and Goodwin, 1999). In a science of qualities, the interactive process, given rich interconnections and deep engagement, will lead to emergent order; hence science of qualities is instable and radically unpredictable. Science of qualities fits character of human nature. It is because human nature is unpredictable. *If change is constant, how it is possible for science to objective?* It is time to rethink about science.

Fourth dimension holism; the theory postulates that universe and especially living nature is correctly seen in terms of interacting wholes. A research supposed to be complete or as a whole. Holism is as known as integrity. Science being objective is not holism but it is a reductionist technique. Reason (1996) and Whitehead (1989) postulates that the principle of holism argues that there are no privileged parts, no primary causes, no blue print which define emergent order, hence a significant outcome of a science of qualities co-operatives inquiry can be seen as "living theory". Subsequently being objective or quantitative in research will create a "dead theory" because it doesn't provide room to potential for growth. Human kind is all about potential of growth (changes). Science of qualities discusses holism and at the same moment it gives opportunity for growth. This is how science should be, improving the elements.

Fifth dimension is fluctuations; to shift back and forth with uncertainty. Reason and Goodwin argued that relational form in social organization life emerges through iterative, nonlinear processes; from that they argued that the kind of science of qualities needed for research / practice should be similarly nonlinear. However, they discovered from complexity theory that iterative processes are rarely regular, but are usually characterized by fluctuations. Undeniable, the world or human nature is uncertain, so it quite ridiculous to assume that science can be objective. It is absurd to assume that everything is constant as human are not robots. Human behaviour is subjected to many variables hence it creates variety of outcomes. It is not possible for denote a value for human behaviour as suggested by quantitative research. Science of qualities is a better fit for research as it provided an element of grey area (fluctuations) which necessary for human research.

The final dimension is edge of chaos; which proposes in very order there is disorder and in every disorder there is order. In complexity theory chaos is described by living inquiry. Living inquiry is a process of continually questioning its own premises and assumptions (Reason and Goodwin, 1999). As fluctuations, edge of chaos simplify suggest that changes and "randomness" occurs persistently. It is difficult to be objective when things are constantly changing. Reason and Goodwin (1999) also added there are 'zones of organization' around the edge of chaos which describe different or order. There is certain zone which is described as frozen regime, highly, rigid and sometimes pathologically ordered with little or no spontaneous activity and other side which the zone of healthy and bounded interaction. Hence, science of qualities is needed because of edge of chaos. If things are objective, it is difficult to estimate the chaos order. Science of qualities fits the category, well.

Ultimate purpose of Research

In conclusion, reading this article provides a clear view why science of qualities is required in research or science is subjective. The theory of complexity provides reason why science of qualities must be adaptive as mode of the research. Incline with that, which is better, quantitative or qualitative? Hence, the answer should be whichever provides the "truth". Truth is the ultimate goal of any research, selecting qualitative and quantitative is just a tool to achieve the truth. The answer for the entire question stated earlier in this review is "truth". Before that, as researchers it time to move out of the cave like Plato suggested. Board thinking capability is required to do research on social sciences subject. *As mentioned research supposed or has to be subject driven not process driven.* This is because complexity theory suggests that human live in an unpredictable but nevertheless intelligible world (Reason and Goodwin, 1999). In personal stance, I would to like include what a "real" scientist explained about science. The scientist is Albert Einstein.

I believe in intuition and inspiration. Imagination is more important than knowledge. Knowledge is limited, whereas imagination embraces the entire world, stimulating progress, giving birth to evolution. It is, strictly speaking, a real factor in scientific research. - Cosmic Religion : With Other Opinions and Aphorisms (1931) by Albert Einstein, p. 97; also in Transformation : Arts, Communication, Environment (1950) by Harry Holtzman, p. 138

I fully agree with you about the significance and educational value of methodology as well as history and philosophy of science. So many people today — and even professional scientists — seem to me like someone who has seen thousands of trees but has never seen a forest. Knowledge of the historic and philosophical background gives that kind of independence from prejudices of his generation from which most scientists are suffering. This independence created by philosophical insight is — in my opinion — the mark of distinction between a mere artisan or specialist and a real seeker after truth. -Letter to Robert A. Thorton, Physics Professor at University of Puerto Rico (7 December 1944) [EA-674, Einstein Archive, Hebrew University, Jerusalem]. Thorton had written to Einstein on persuading colleagues of the importance of philosophy of science to scientists (empiricists) and science.

Even scientist in the calibre of Albert Einstein prefers the more humanistic approach in science. Although he doesn't believe in God but he believed in human values in science. Einstein asked other scientist to approach science in more artistic ways rather being concrete. Science will be more valuable to human kind if it subjective, in which it relates to emotional factor.

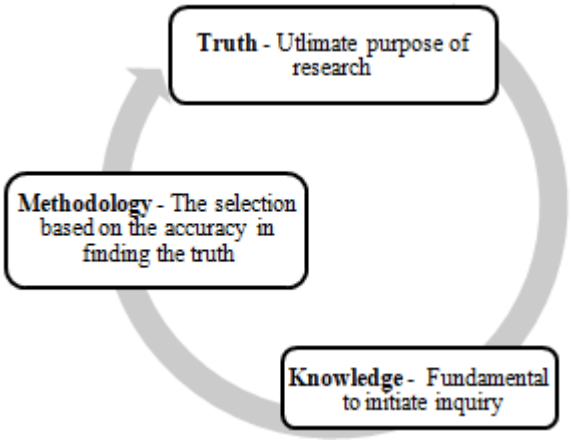

Diagram 1: A Model of Toward Science of Qualities in Research

This model depicts the on the purpose of research. Every researcher will have knowledge about something but the quest to find the truth might differ for everyone. Hence, the researcher has vital tasks to choose the right methodology in finding the truth of the particular knowledge. As discussed earlier all research should be subject driven rather process driven. Perhaps, the current research should consider qualitative approach because it is a part science and it is more profoundly connected to human values.

The method of research should be considered with the requirement of the research; any methodology is good as long as its ultimate goal of research is to find truth. Qualitative, quantitative, subjective or objective it tools to find the truth in any social science research. Importantly, human should be treated as "human" with values not as "robots". Humans are subjected to values and it should be included in any form of research. As for my students, I have assisted them in understanding science of qualities.

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Author Profile

S.N. Tharma Raj teaches Management and Humanities Subjects at Multimedia University in Malaysia and visiting lecturer at few private colleges. His research focuses on the qualities traits of human behaviour and soft skills in management. He has been advocating more humanistic approach in conducting research rather than focusing on rigid approach which believed as better than the other. This article is written based on his elastic discussion on research methodology in his class.