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## An Introduction to Research Paradigms

Adil Abdul Rehman<sup>1\*</sup> and Khalid Alharthi<sup>2</sup>

1. English Language Institute, King Abdulaziz University, Jeddah, Jeddah, 21589, B. O Box 80200, Saudi Arabia.

2. English Language Institute, King Abdulaziz University, Jeddah, Jeddah, 21589, B. O Box 80200, Saudi Arabia.

\*Corresponding Email: aabdulrehman@kau.edu.sa

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**Abstract** – The aim of this article is to provide a brief outline of different research paradigms. It explores the philosophical underpinnings of three major paradigms: positivism, interpretivism, and critical theory. The article starts with a brief description of the four components of a research paradigm: ontology, epistemology, methodology, and methods. This is followed by a detailed discussion of the three paradigms and what characterizes the four components in each of the three paradigms. The article concludes by stating that researchers can investigate different phenomena under any of the three paradigms and they should not eschew the possibility of subscribing to different paradigms because of any concerns that they have to be mutually exclusive. Instead, the decision of choosing a philosophical outlook to investigate a phenomenon should be guided by the necessities and requirements of a research study rather than the obdurate insistence of adhering to one particular philosophical outlook to the exclusion of others.

**Keywords:** research paradigm, ontology, epistemology, methodology, positivism, interpretivism, critical theory

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### 1. INTRODUCTION

As researchers, we have to be able to understand and articulate beliefs about the nature of reality, what can be known about it and how we go about attaining this knowledge. These are elements of research paradigms. A paradigm is a basic belief system and theoretical framework with assumptions about 1) ontology, 2) epistemology, 3) methodology and 4) methods. In other words, it is our way of understanding the reality of the world and studying it. We will look closely at the four components of a research paradigm.

#### 1.1. Ontology

*Ontology and epistemology are to research what 'footings' are to a house: they form the foundations of the whole edifice. (Grix, 2004, p. 59)*

Ontology refers to “the nature of our beliefs about reality” (Richards, 2003, p. 33). Researchers have assumptions (sometimes implicit) about reality, how it exists and what can be known about it. It is the ontological question that leads a researcher to inquire what kind of

reality exists: “A singular, verifiable reality and truth [or] .... socially constructed multiple realities” (Patton, 2002, p. 134).

### **1.2. Epistemology**

Epistemology refers to “the branch of philosophy that studies the nature of knowledge and the process by which knowledge is acquired and validated” (Gall, Gall, & Borg, 2003, p. 13). It is concerned with “the nature and forms [of knowledge], how it can be acquired and how communicated to other human beings” (Cohen, Manion, & Morrison, 2007, p. 7). It is the epistemological question that leads a researcher to debate “the possibility and desirability of objectivity, subjectivity, causality, validity, generalisability” (Patton, 2002, p. 134). Adhering to an ontological belief system (explicitly or implicitly) guides one to certain epistemological assumptions. Therefore, if a singular verifiable truth 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 are’ and ‘how things really work’” (Guba & Lincoln, 1994, p. 108). Conversely, belief in socially constructed multiple realities leads researchers to reject the notion that people should be studied like objects of natural sciences; they get involved with the subjects and try and understand phenomena in their contexts.

### **1.3. Methodology**

Methodology is “an articulated, theoretically informed approach to the production of data” (Ellen, 1984, p. 9). It refers to the study and critical analysis of data production techniques. It is the “strategy, plan of action, process or design” that informs one’s choice of research methods (Crotty, 1998, p. 3). It “is concerned with the discussion of how a particular piece of research should be undertaken” (Grix, 2004, p. 32). It guides the researcher in deciding what type of data is required for a study and which data collection tools will be most appropriate for the purpose of his/her study. It is the methodological question that leads the researcher to ask how the world should be studied.

### **1.4. Methods**

Methods are specific means of collecting and analysing data, such as questionnaires and open ended interviews. What methods to use for a research project will depend on the design of that project and the researcher’s theoretical mindset. However, it must be noted that use of particular methods does not entail ontological and epistemological assumptions.

## **2. DIFFERENT APPROACHES TO EDUCATIONAL RESEARCH**

We will now look at three different approaches to educational research: 1) Positivism 2) Interpretivism 3) Critical theory. This is essential because as consumers of research, we have to be able to look deeper into claims made by researchers who adhere to different research paradigms. According to Patton (2002), “When researchers operate from different frameworks,

their results will not be readily interpretable by or meaningful to each other” (p.134). Being aware of a researcher’s ontological and epistemological beliefs (which are not always made explicit but have to be deduced) will help us better understand the import and relevance of the study. Furthermore, someone who is ideologically rooted in one research paradigm and ignorant of the theoretical underpinnings and terminology of other research paradigms is not in a good position to appraise research conducted under a different tradition.

## **2.1. Positivism**

The term positivism refers to a branch of philosophy that rose to prominence during the early nineteenth century because of the works of the French philosopher Auguste Comte (Richards, 2003, p. 37). Positivism assumes that reality exists independently of humans. It is not mediated by our senses and it is governed by immutable laws. The ontological position of positivists is that of realism. Positivists strive to understand the social world like the natural world. In nature, there is a cause-effect relationship between phenomena, and once established, they can be predicted with certainty in the future. For positivists, the same applies to the social world. Because reality is context free, different researchers working in different times and places will converge to the same conclusions about a given phenomenon. The epistemological position of positivists is that of objectivism. Researchers come in as objective observers to study phenomena that exist independently of them and they do not affect or disturb what is being observed. They will use language and symbols to describe phenomena in their real form, as they exist, without any interference whatsoever. As Hutchinson (1988) states, “Positivists view the world as being ‘out there’, and available for study in a more or less static form” (cited in Gall et al., 2003, p. 14). Positivists believe that there are laws governing social phenomena, and by applying scientific methods, it is possible to formulate these laws and present them through factual statements.

Many scholars have criticized the positivist approach (see Richards, 2003, p. 37). While objective and scientific methods are appropriate for studying natural objects, they are not as successful when they are applied on social phenomena. The complexity of laws governing individuals, their idiosyncrasies, their relationship with each other, with institutions and with society are in stark contrast with the order and regularity one finds in the natural world. The positivist assumption that applying scientific methods to social phenomena will lead to discovery of laws that govern them has been deemed “naïve” by Richards (2003, p.37) who cites different researchers who go so far as to say that “Positivism is dead. By now, it has gone off and is beginning to smell” and “It has become little more than a term of abuse” (Richards, 2003, p.37).

Criticism of the positivist paradigm lead to the emergence of post-positivism, which “straddles both the positivist and interpretivist paradigms” (Grix, 2004, p. 86). Post-positivism is an attempt to address the weaknesses of the positivist paradigm. The ontological position of post-positivism is that of critical realism. It assumes a reality that exists independent of the observer, but which can only be apprehended imperfectly because of the complexity of social phenomena; it also recognizes the possibility of the researcher’s own beliefs and values affecting what is being observed.

Positivist methodology relies heavily on experimentation. Hypotheses are put forward in propositional or question form about the causal relation between phenomena. Empirical evidence is gathered; the mass of empirical evidence is then analysed and formulated in the form of a theory that explains the effect of the independent variable on the dependent variable. The approach to analyzing data is deductive; first, a hypothesis is proposed, then it is either confirmed or rejected depending on the results of statistical analysis. The purpose is to measure, control, predict, construct laws and ascribe causality (Cohen et al., 2007). If it could be proved that A caused B, then a theory will be formulated for wider applicability which will illustrate the causal relation between A and B: 'A causes B' or 'A leads to B' etc. To be able to do this, the researcher has to make sure that it was indeed A that caused B, not anything else. This calls for manipulation because in the social world, there are always different factors that could lead to a certain effect. For the theory to be robust, it has to be able to withstand efforts to refute it empirically. To make sure no other variables caused the effect, positivist researchers try to control extraneous variables, with two or more groups being subjected to the same conditions with the only difference being the independent variable. Establishing causal relation between phenomena without any interference from extraneous variables means that the experiment has internal validity. However, that still leaves open to discussion the question of external validity. The more rigorous the attempts of a researcher to control extraneous variables, the more effect it has on generalisability. If the amount of control has created an environment that is nearly impossible to find in a real world situation, the results of the experiment could be meaningless.

Positivist research often generates numerical data. Gall et al. (2003) sum this up cogently when they say:

The use of quantification to represent and analyze features of social reality is consistent with positivist epistemology. Because this epistemology assumes that features of social reality have a constancy across time and settings, a particular feature can be isolated and it can be conceptualized as a variable, that is, as an entity that can take on different values. These values can be expressed as numerical scales. (pp. 19-20)

The quantitative data that positivist researchers use to answer research questions and formulate theories can be collected through true experiments or less rigorous quasi-experiments, standardized tests and large or small scale surveys using closed ended questionnaires. The numeric data that are generated through these methods are subjected to descriptive or inferential statistical analysis.

According to the positivist approach, research is deemed to be of good quality if it has a) internal validity b) external validity c) reliability d) objectivity (Guba & Lincoln, 1994). If the researcher proves that it is the independent variable (and not other variables) that had an effect on the dependent variable, the study is considered to have internal validity. If the results thus arrived at are generalizable, it has external validity. If different researchers conduct the study in different times, places and contexts and arrive at the same results, it has reliability. If researchers study phenomena without contaminating their apprehension, they are considered to be objective.

The positivist paradigm has been widely criticized by interpretivists and critical theorists (See Gage, 2007; Richards, 2003). One of the most commonly repeated criticisms is that

scientific methods, though appropriate for studying natural phenomena, fall short when they are used to study individuals and social phenomena (Gage, 2007; Gall et al., 2003; Grix, 2004; Richards, 2003). Although this criticism is not without merit, one must remember that sometimes, those leveling this criticism at positivism might have different worldviews. As Hughes and Sharrock (1997) point out, “The critics of positivist social science... like all critics have a tendency to present a picture of the opposition, in this case positivism, as if it were not only stupid but without any subtlety and variety” (p.24). Anti-positivists, for all their criticisms, “have never been able to formulate an alternative conception that answers the most important questions” (House, 1991, p. 3). Despite the barrage of criticism from anti-positivists, there has been no decline in positivistic research in education and some positivist researchers have “awakened from their torpor in responding to criticism and began to reply, point by point” (Gage, 2007, p. 6). Grix (2004) outlines the reasons for this most cogently:

The attractiveness of an approach seeking the precision, exactitude and power of prediction promised by the natural sciences is understandable. The human sciences can be messy, people unpredictable and factors leading to events hard to unravel. Positivism attempts to overcome this messiness by seeking rules and laws with which to render the social world understandable. (pp. 81-82)

## **2.2. Interpretivism**

Interpretivism is a “response to the over-dominance of positivism” (Grix, 2004, p. 82). Interpretivism rejects the notion that a single, verifiable reality exists independent of our senses. Interpretive ontology is anti-foundationalist. It refuses “to adopt any permanent, unvarying (or foundational) standards by which truth can be universally known” (Guba & Lincoln, 2005, p. 204). Instead, interpretivists believe in socially constructed multiple realities. Truth and reality are created, not discovered. It is not possible to know reality as it is because it is always mediated by our senses. Interpretive epistemology is subjective. External reality cannot be directly accessible to observers without being contaminated by their worldviews, concepts, backgrounds etc. As Flick states, “Perception is seen not as a passive-receptive process of representation but as an active constructive process of production” (2004, p.89). Individuals interact with other individuals and society and ascribe meaning and names to different social phenomena.

According to Grix (2004), “researchers are inextricably part of the social reality being researched, i.e. they are not ‘detached’ from the subject they are studying” (p.83). In the case of different well-argued interpretations about one phenomena, one interpretation is not chosen or preferred over others as the “correct” one but the existence of multiple knowledges is accepted with the acknowledgement that different researchers bring different perspectives to the same issue. The goal of interpretive research is not to discover universal, context and value free knowledge and truth but to try to understand the interpretations of individuals about the social phenomena they interact with. This concept of knowledge is an inevitable corollary of interpretive ontology. If one believes in multiple socially constructed realities, it follows that these realities are approached from different angles by different people. As Blaikie (2000) states:

Social researchers can only collect data from some point of view, by making ‘observations’ through spectacles with lenses that are shaped and colored by the researcher’s language, culture, discipline-based knowledge, past experiences (professional and lay), and experiences that follow from these... Therefore, there will always be a gap of some kind between the data that are collected and the reality that they are supposed to represent. (p. 120)

Interpretive methodology requires that social phenomena be understood “through the eyes of the participants rather than the researcher” (Cohen et al., 2007, p. 21). The goal of interpretive methodology is to understand social phenomena in their context. Interpretivists collect mostly qualitative data from participants over an extended period of time, as in ethnography and case studies. The approach to analyzing data thus generated is inductive, i.e. the researcher tries to discover patterns in the data which are collapsed under broad themes to understand a phenomenon and generate theory. This is the polar opposite of the deductive approach, in which researchers start off by identifying patterns and themes before starting the data collection process; once data is collected, researchers would search through the data for words, statements and events which are instances of the pre-identified patterns and themes. Interpretivists use the inductive approach instead of the deductive approach because “they tend to see theory as deriving from data collection and not as the driving force of research” (Grix, 2004, p. 108). Data is mostly verbal instead of statistical and it is usually audio/video recorded to “preserve the events in a fairly authentic manner for subsequent data analysis” (Gall et al., 2003, p. 21).

Interpretive researchers employ methods that generate qualitative data, and although numerical data could be involved, they are not relied upon. Examples of data collection methods that yield qualitative data include: open ended interviews with varying degrees of structure (standardized open-ended interviews, semi-standardized open ended interviews, and informal conversational interview), observations, field notes, personal notes, documents etc.

Guba and Lincoln (1994) have proposed a set of criteria to judge the trustworthiness of interpretive research. Research is considered to be of good quality if it has credibility (internal validity), transferability (external validity), dependability (reliability) and confirmability (objectivity) (Guba & Lincoln, 1994, p.114). If researchers are honest and conscientious in their efforts for approximation to truth, the results hold resonance for people in other contexts and the steps and methods of the study are described in detail, then study has elements of the quality criteria proposed by Guba and Lincoln.

The interpretive paradigm has been criticized for, among other things, being “soft”, incapable of yielding theories that could be generalized to larger populations and the involvement of the researcher with participants which leads to lack of objectivity (Grix, 2004). Richards (2003) disagrees and states that qualitative inquiry is not “soft... it demands rigour, precision, systematicity, and careful attention to detail” (p.6). Although positivist research has its merits, there are social phenomena that could be best investigated under the interpretive paradigm. Surveys, closed ended questionnaires and lists of numbers alone are sometimes not the best option because “they are not designed to explore the complexities and conundrums of the immensely complicated social world that we inhabit” (Richards, 2003, p. 6).

### **2.3. Critical Theory**

Critical theory originates from the works of a group of twentieth century authors who were affiliated with the Institute of Social Research at the University of Frankfurt, hence the name ‘the Frankfurt School’. They include Herbert Marcuse, Theodor Adorno, Max Horkheimer, Erich Fromm and later Jürgen Habermas. The ontological position of critical theorists is that of historical realism. It is assumed that a reality exists, but it has been shaped by cultural, political, ethnic, gender and religious factors which interact with each other to create a social system. Epistemologically, critical theory is subjective in that it is assumed that no object can be researched without being affected by the researcher. Critical educational researchers try to be self-conscious of their own epistemological presuppositions and communicate them clearly when entering into an investigation so “no one is confused concerning the epistemological and political baggage they bring with them to the research site” (Kincheloe & McLaren, 2005, pp. 305-306).

Knowledge endorsed by those in power (politically or educationally) is to be viewed critically. The rules that legitimize some bodies of knowledge and delegitimize others should be questioned. In the words of Kincheloe (2008), we should ask ourselves: “How did I get stuck with this body of knowledge and these lenses through which to see the world?” (p.21).

The aim of critical educational research is not merely to explain or understand society but to change it (Patton, 2002). It is critical of both interpretive and positivist approaches to research because they are regarded to be “enmeshed in dominant ideology... neither has an interest in changing the world, and neither has an emancipatory goal” (Scott & Usher, 2000, p. 35). Instead of generating knowledge of the social world as it exists and perpetuate knowledge status quo (Kincheloe, 2008), critical researchers endeavor to bring to light the beliefs and actions that limit human freedom with the ultimate aim of transforming the situation. The task of critical educational researchers is to confront those in positions of power and expose the oppressive structures that subjugate people and create inequality. According to Guba and Lincoln (1994), “The inquirer is cast in the role of instigator and facilitator” (p.113).

Critical methodology is dialogic and dialectical (Guba & Lincoln, 1994); it requires the investigator to engage the subjects in dialogue with the aim of bringing about a change in their outlook on social systems that keep them deprived of intellectual and social needs. To prevent the possibility of the participants being marginalized, researchers use a collaborative approach and engage the subjects in formulating questions, data collection and analysis etc. The transformation of social systems that are built on injustice and discrimination could be achieved by the methodologies employed by critical educational researchers: critical ethnography, critical discourse analysis, action research, ideology critique, etc. Critical ethnography is aimed at probing and criticizing taken for granted assumptions about race, culture, gender, economy, politics etc. to change awareness. In critical discourse analysis, analysts set out to study how the powerful use language to maintain their authority. According to Gall et al. (2003), “An individual’s awareness is both expanded and constrained by the language that is available to the individual for encoding his experience” (p.497). Therefore, it is possible to control awareness by controlling language. Action research refers to ways of investigating an immediate problem by identifying a problem, planning an intervention, implementing the plan,



observing the changes and reflecting on the changes observed (Richards, 2003). Ideology critique exposes values and practices that aim to keep people subjugated.

In critical research, mostly qualitative data is generated, although quantitative data could also be used. Examples of qualitative data collection methods are mentioned under the interpretive paradigm.

Critical research is deemed to be of good quality if it takes into account the political, cultural, ethnic and gender antecedents of the situation. Another criterion for quality critical research is the degree to which the subjects' misapprehensions about the dominant ideology and status quo are exposed and the degree to which it facilitates "action designed to redress the unequal and oppressive structures that have now been exposed" (Richards, 2003, p. 40).

### 3. CONCLUSION

Nathaniel Gage (1989) went so far as to call the discussions and disagreements between adherents of different educational research approaches 'the paradigm wars'. Guba and Lincoln (1994) considered this description overdrawn because it painted the matter as more confrontational than it actually was. Personally, we do not agree with the view that the three paradigms should be treated as three religions: that adherence to one paradigm makes one a heretic according to the lenses of the adherents of other paradigms. This fanatical view would also preclude the possibility of mixing any elements of different paradigms because they are 'incompatible'. One should choose methods and methodology which one finds most suitable for investigating the phenomena one sets out to investigate. We do not believe that one should distort one's own outlook to force oneself to abide by the creed of a philosophical or methodological tradition just to avert the threat or accusation of 'intellectual excommunication'.

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