

The nature of educational research philosophy essay



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Educational research plays an important role in exploring problems associated with education and as a consequence it improves Teaching and Learning. According to Gay and Airasian (2000), educational research is conducted to provide trustworthy information regarding educational problems and their solutions. There are many approaches to educational research shaped by different research paradigms. The various research paradigms have different criteria for ontology and epistemology to maintain quality standards. The ontology and epistemology of a research paradigm influence researchers applying the quality standards, methodology and methods (Koul, 2008).

What is Educational Research:

Research is a combination of both experience and reasoning and must be regarded as the most successful approach to the discovery of truth, particularly as far as the natural sciences are concerned

(Borg, 1963, as cited in Cohan, Manion, & Morrison, 2000).

Educational research can be defined as a ' purposeful and systematic' enquiry ' to solve a problem, illuminate a situation or add to our knowledge' (Mutch, 2005, pp. 14) ' by the discovery of non-trivial facts and insights' (Howard & Sharp, 1983, as cited in Bell, 2005, pp. 2) ' in relation to the improvement of education policy and practices, with a commitment to broader dissemination of research findings beyond publication in high status, international, refereed journals' (Lingard & Gale, 2010, pp. 31).

The characteristics of educational research are part of its nature. According to Anderson and Arsenault, (1998, p. 7), there are ten characteristics of educational research which can be grouped into three main categories; the purpose of research, the procedures of research, and the role of researcher. The purposes of research are to solve the problems, investigate knowledge, and establish principles in educational phenomena. In short, this category focuses on solving problems and developing knowledge. The procedure of educational research involves collecting or generating data with accurate observation, objective interpretation, and verification. It also involves carefully designed procedures and rigorous analysis. Finally, the role of researchers is to be experts in their field of study, using research data to develop solutions and increase knowledge. It is also essential for researchers to be patient and careful to use every step of research's procedures to achieve the purpose of research.

What is a Paradigm:

The use of this fashionable word came about from the philosopher of science, Thomas Kuhn. The word comes from the Greek work paradeigma which translates literally as ' pattern'. It is used in social science to describe an entire way of looking at the world (Davidson & Tolich, 1999).

A paradigm can be viewed as a set of basic beliefs (or metaphysics). 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, as, for example, cosmologies and theologies do (Denzin & Lincoln, 1998, pp. 200).

A paradigm relates to a particular set of philosophical assumptions about what the world is made of and how it works. One way to consider a paradigm is as a collection of ontological and epistemological assumptions (Davidson & Tolich, 1999).

Inquiry paradigms define for inquirers what it is they are about, and what falls within and outside the limits of legitimate inquiry. The basic beliefs that define inquiry paradigms can be summarised by the responses provided to three fundamental questions (which are interconnected in such a way that the answer to any one question, given in any order, restricts how the other two may be answered) (Denzin & Lincoln, 1998, pp. 200). The questions are the epistemological question, the ontological questions, and the methodological question.

The Epistemological Question:

What is the form and nature of reality and, therefore, what is there that can be known about it?

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”. Then only those questions that relate to matters of “real” existence and “real” action are admissible; other questions, such as those concerning matters of aesthetic or moral significance, fall outside the realm of legitimate scientific inquiry (Denzin & Lincoln, 1998, pp. 201).

Questions for analysing paradigms

Research paradigms

Positivism

Epistemological questions

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

Role of theory

Theories are:

Normative

Present ‘ models’

General propositions explaining causal relationships between variables

Theory building/testing

Postulate a theories that can be tested in order to confirm or reject

Prove a theory from observable phenomena / behaviour

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Test theories in a controlled setting, empirically supporting or falsifying hypotheses through process of experimentation

Role of research

Uncover reality i. e. natural laws

Scientifically explain / describe, predict and control phenomena

Research findings are true if:

Can be observed and measured

Can be replicated and are generalizable

Role of common sense

None – only deductive reasoning

The Ontological Question:

What is the nature of the relationship between the knower or would be knower and what can be known? 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. 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 discover “how things really are” and “how things really work” (Denzin & Lincoln, 1998, pp. 201).

Questions for analysing paradigms

Research paradigms

Positivism

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

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

The Methodological Question:

How can the inquirer (would be knower) go about finding out whatever he or she believes can be known? The answer that can be given to this question is constrained by answers already given to the first two questions; that is, not just any methodology is appropriate. For example, a “ real” reality pursued

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by an “ objective” inquirer mandates control of possible confounding factors, whether the methods are qualitative (e. g. observational) or quantitative (e. g. analysis of covariance). The methodological question cannot be reduced to a question of methods; methods must be fitted to a predetermined methodology (Denzin & Lincoln, 1998, pp. 201).

Questions for analysing paradigms

Research paradigms

Positivism

Methodological questions

Role of researcher

Objective, independent from the subject

Investigator often controls the investigated

Role of values

Science is value-free

Values have no place in research – must eliminate all bias

Methods

Empirical

Structured and replicable observation

Quantification / measurement

Experimental – directly manipulate variables and observe

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Type of studies

Survey studies

Verification of hypotheses

Statistical analysis

Quantitative descriptive studies

What is Positivism:

“ Knowledge is based not on unchallengeable, rock-solid foundations, but rather upon human conjectures” (Phillips & Burbules, 2000).

Positivism is an epistemological perception which states that only knowledge which is based on sensory experience and positive verification is authentic knowledge. More simply worded, positivism is the view that all true knowledge is scientific, and that all things are ultimately measureable.

Positivism emerged from the success of the scientific approach in natural sciences such as physics, chemistry, and biology. The impetus for this came from the overwhelming success of science in understanding and solving problems in the natural world.

The ontology of positivism is realism; an apprehend able reality that is assumed to exist, driven by immutable natural laws and mechanisms.

Knowledge of the “ ways things are” is conventionally summarised in the form of time- and context-free generalizations, some of which take the form of cause-effect laws. Research can, in principle, converge on the “ true” state

of affairs. The basic posture of the paradigm is argued to be both reductionist and deterministic (Hesse, 1980, cited in Denzin & Lincoln, 1998, pp. 204).

The epistemology of positivism is dualist and objectivist; meaning the investigator and the investigated “ object” are assumed to be independent entities, and the investigator to be capable of studying the object without influencing it or being influenced by it. When influence in either direction (threats to validity) is recognised, or even suspected, various strategies are followed to reduce or eliminate it. Inquiry takes place as through a one-way mirror. Values biases are prevented from influencing outcomes, so long as the prescribed procedures are rigorously followed. Replicable findings are, in fact, “ true” (Denzin & Lincoln, 1998, pp. 204).

The methodology of positivism is experimental and manipulative. Questions and/or hypotheses are stated in propositional form and subjected to empirical tests to verify them; possible confounding conditions must be carefully controlled (manipulated) to prevent outcomes from being improperly influenced (Denzin & Lincoln, 1998, pp. 204).

Originally conceptualised by Auguste Comte in the early 19th Century (Pickering, 1993), positivism has been greatly criticised, including by positivist themselves. A number of the concerns raised have influenced the epistemological position taken within this research; particularly that knowledge is a social variable, knowing one is the subject of a study, changes in one’s behaviour, and the notion of subjectivity and value orientation.

What is Social Construction of Reality/ Post-Positivism:

The Social Construction Reality/ Post-positivism paradigm include the following paradigms: interpretive, critical, feminist, and postmodern paradigm. I think interpretive paradigm is the paradigm that most education research is based on at the University of Waikato.

The social construction of reality assumes that knowledge is subjective and unique therefore researchers undertake “ systematic and painstaking analysis of social episodes” (Cohen, Manion and Morrison, 2007, pp. 19). This is a less reductionist approach to research recognizing the importance of context and aiming to represent how participants view their world. Rather than seeking generalisations this paradigm accepts that “ reality is multilayered and complex” (Cohen et al, 2007, pp. 21) therefore data collected are open to multiple interpretations. This approach is more speculative based on the assumption that theory is emergent therefore the researcher should not be seeking evidence purely to support a predetermined hypothesis.

Post-positivism is a meta-theoretical stance that analyses and adjusts positivism in light of the criticisms which positivism, as a scientific paradigm, has received. Post-positivism offers primary amendments to the positivist paradigm. Firstly, that the absolute separation of the knower and the known is not assumed; and secondly, that a single, shared reality which excludes all others is not assumed to be a true basis for reasoning. It is critical to note that post-positivism is not a rejection of the scientific paradigm, but seeks to amend the criticisms associated with positivism (Phillips & Burbules, 2000; Zammito, 2004).

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Post-positivism states that knowledge is based not on unchallengeable, rock-solid foundations, but rather on human conjectures (Phillips & Burbules, 2000; Zammito, 2004). Epistemologically speaking post-positivism works on the position that facts and law deduced through research are probably true (Guba & Lincoln, 2005) in light of evidence provided (Phillips & Burbules, 2000; Zammito, 2004). Post-positivism of this type is common place in social science for conceptual and practical reasons (Phillips & Burbules, 2000; Zammito, 2004).

What are the differences between the two Meta-Paradigms:

Based on the literature, the most fundamental differences between both paradigms are how they search for the truth and define validity and reliability. The positivist paradigm seeks and finds them in a (perceived) value free and objective evidence based world and the constructivists in a subjective, contextual and interpretive world (Silverman 2005, p. 6; and Cohen et al. 2007, p. 26).

Research as creating new knowledge:

Positivism and Post-positivism create knowledge by a process of accretion, with each fact (or probable fact) serving as a kind of building block that, when placed into its proper niche, adds to the growing “ edifice of knowledge”. When the facts take the form of generalisation or cause-effect linkages, they may be used most efficiently for prediction and control. Generalisations may then be made, with predicable confidence, to a population of settings (Denzin & Lincoln, 1998, pp. 212).

What counts as evidence in Educational Research:

Evidence in education depends on what is being asked. If the research question is about effectiveness or direct impact, the best kind of evidence is going to result from experimental studies and trials (preferably randomised controlled trials to ensure fairness and reliability, assuming that validity can be established); however, if the question is about the nature of a problem, or how some intervention works, or how a naturally occurring process takes place, then the best kind of evidence will be of a different nature. Essentially, the key to the kinds of evidence that count will be in the nature of the claim or proposition, which can be converted into a research question, hypothesis or problem as appropriate (or all three if necessary) as a starting point for the research. Anyone with an interest in ‘evidence’, whether as a teacher, researcher, teacher-trainer, lecturer, policy-maker or student, needs to bear in mind the fact that evidence is always connected to a proposition of some kind and does not come unencumbered by that proposition. It cannot, therefore, be taken for granted that it is true. Even if the proposition that gives significance to the evidence is made clear, the reader still has to ask: how is the connection made possible? And what values, assumptions and conventions are behind that kind of connection? (Andrews, 2007).

Maintaining quality in Educational Research:

Since the focus of the post/positivist paradigm is to discover the ‘truth’ through empirical investigation, the quality standards under this paradigm are validity and reliability. Anderson and Arsenault (1998, pp. 257) write that “validity refers to the extent to which what we measure reflects what we expected to measure [which] has two forms: internal and external.

Therefore, “ an experiment is valid if results obtained are due only to the manipulated independent variable and if they are generalizable to individuals or contexts beyond the experimental setting” (Gay & Airasian 2000, pp. 371).

Related to the research, internal validity refers to what extent the findings meet expected results. Meanwhile, external validity refers to the ability of findings to be generalized to other situations and contexts. In order to fulfill these standards, objectivity is important to minimize researcher bias. The analysis of validity is conducted through statistical analysis. “ Reliability refers to the extent that an instrument will yield the same results each time it is administered” (Anderson & Arsenault 1998, pp. 256).

Under this paradigm, reliability is an important indicator for the consistency of research findings which can then be replicated. Through statistical analysis, reliability can be estimated by internal consistency based on the correlation among the variables by using Cronbach’s alpha reliability coefficient (Brown, 2007; Newby & Fisher, 1997). The size of the data source is directly linked to quality standards, for example the larger the source of the data, the greater the reliability of the results (Babbie 1990).

According to Guba and Lincoln (1989, pp. 235), “ objectivity responds to the positivist demand for neutrality and requires a demonstration that a given inquiry is free of bias, values, and/or prejudice”. Therefore, each step of research, especially methods which are applied in this research paradigm, should minimize researcher bias. During the research process, data is triangulated to reach one conclusion from different methods and data

sources. The triangulation is “ an attempt to secure in depth understanding of the phenomenon in question, ensuring the objectivity can never be captured” (Denzin & Lincoln 2000, pp. 5).

Furthermore, trustworthiness and credibility are foundational criteria to maintaining quality, because trustworthiness is a deliberated parallel to the positivist criteria that are internal validity, external validity, reliability, and objectivity (Guba & Lincoln 1989). The trustworthiness criteria comprise four quality standards: the credibility (via member checking), transferability (via thick description), dependability (via outside reviewer), and conformability (conformability data audit). Credibility is parallel to internal validity. In credibility, the idea of similarities between constructed realities of respondents and the reconstructions attributed to them are measured (Guba & Lincoln 1989, p. 237). In interpretive research, different methods are applied to assess the credibility of the findings. According to Merriam (1989) (as cited in Howitt 2007), multiple methods and perspectives, and member checking are applied for improving credibility.

The role of Peer Review in validating new knowledge in Educational Research:

Research shows that the process not only improves the language that authors use and the way that they present their ideas, but may also alert them to statistical and scientific errors in their research, inappropriate methodology, or inaccuracies in referencing which they can then correct before publication. Submitting work to an international journal for anonymous refereeing by unknown peers is, in short, still one of the best

tests of scholarly credibility in the academic world (Taylor & Francis Author Services, 2010).

An essential aspect of the scientific process in the life sciences is the thorough examination of manuscripts by other scientists. They read the article critically and then either suggest that it is accepted, rejected, or most frequently revised and improved before it is published. In fact, most scientists will not consider a scientific pronouncement as valid unless it has been approved by this anonymous process, known as peer review. Without such an external seal of approval, they would consider any results presented as preliminary, potentially flawed and generally of the same self-serving status as a press release (Gannon, 2001).

Peers are asked to perform the demanding task of examining the work a colleague has submitted. The extent to which a final paper has been improved by a referee's insistence that further controls must be performed, or that an alternative interpretation should be considered, should not be underestimated. Indeed, the very fact that the authors know that their work will be scrutinised raises the standard of a publication before it is even sent to a journal (Gannon, 2001).

Conclusion:

Educational research with its characteristics is influenced by four major paradigms. Each paradigm has its own epistemology, ontology, and quality standards which influence the researchers to find the truth and see the reality. The important point is that knowing the nature of each paradigm which can help the researchers to conduct their research process.

Researchers can conduct the research within and across paradigms which is called multi-paradigmatic research paradigms (Taylor, 2008).

The nature of educational research is analogous with the nature of research itself, which is systematic, reliable and valid to find the “ truth”, investigates knowledge, and solves problems. Moreover, educational research process involves steps to collect the information in order to investigate problems and knowledge. However, the educational research is more complex because it can use various approaches and strategies to solve problems in educational setting. It also can involve many disciplines such as anthropology, sociology, behaviour, and history. In addition, educational research is important because of contributing knowledge development, practical improvement, and policy information. Therefore, educators can use those research findings to improve their competences and teaching and learning process (Yulirahmawati, 2008).