

METHODOLOGY ARTICLE

Quantitative and qualitative research methods: Considerations and issues in qualitative research

HASSAN HAMEED, *Chancellor, The Maldives National University*

ABSTRACT *In the past four decades, research using qualitative methods is increasingly being used to create images of reality. The methods present a challenge because the process of collection and organization of these images are not well-defined. This paper, after summarizing the features of quantitative and qualitative research, outlines the major considerations in delimiting and interpreting qualitative inquiries.*

KEYWORDS *qualitative research, quantitative research, research considerations, positivist, naturalistic, rationalistic*

Traditionally, researchers from the social sciences have been of a quantitative/positivist persuasion. However, since the early 1980s, there has been an upsurge of interest in qualitative/naturalistic approaches to research; some researchers going to the extent of claiming that qualitative/naturalistic method should be the preferred approach for social sciences. Others argue that qualitative methods may gather data about human behavior that is impossible to obtain by the more quantitative techniques.

This paper, after the definition of terms, compares the differences between the two methods and proceeds to discuss their characteristic postures. It then outlines the main problems facing the qualitative/naturalistic researcher and concludes with a discussion of considerations and issues of this method of inquiry.

Definition of Terms

At the outset, it is important to recognize the distinguishing features of the two methods. Quantitative/rationalistic and qualitative/naturalistic approaches differ substantially at the paradigm level. Rationalistic methods are based on a positivist paradigm which had its beginnings in the 19th century. One of the first proponents, Frenchman Auguste Comte argued that “so successful has been the application of scientific method to natural phenomena, that comparable achievements could be obtained from social phenomena if the same method is applied” (Cohen &

Manion, 1980; p. 25). Rationalistic methods are sometimes known as experimental, scientific, scientistic, positivist and by other names. However, from the 1980s, the more common term is quantitative.

Qualitative research methods subsume under a broad definition, its different variants such as ethnographic, naturalistic, anthropological, phenomenological and case study approaches. “Hard-nosed” positivists call this approach “story telling.”

Adelman et al. (1976) in their seminal paper on refining case study methods describe case study as another umbrella term “for a family of research methods having in common the decision to focus an inquiry around an instance of action.” (p. 140).

Ethnographic methods are not synonymous with case studies. Wolcott (1985) attempts to define ethnographic approach by describing what it is not. He concludes that it should be defined in terms of its intent: “the purpose of ethnographic research is to describe and interpret cultural behavior.” (p. 190). Kimball (in Wolcott, 1985) asserts that most so-called educational research is really educational reform in disguise. He contends that any form of educational research could not follow an ethnographic approach since it would not seek cultural interpretation as an end product; instead, it would be linking descriptive research to efforts at change and improvement. Table 1 summarizes the basic assumptions that differentiate the two paradigms (after Guba, 1982).

Table 1
Axiomatic Differences between the Two Paradigms

Subject	Quantitative (Rationalistic)	Qualitative (Naturalistic)
Reality	Tangible, fragmentable	Multiple, holistic, intangible
Researcher-subject relationship	Independent	Interrelated
Nature of truth statements	Context-free generalizations	Context-specific hypotheses
Explanation of action	Real causes, manipulable	Interactive, non-manipulable
Relation of values to inquiry	Value-free	Value-bound

Methodological Differences between Quantitative and Qualitative Research

Methodology refers to the theoretical justification of the research in a chosen discipline including principles, axioms, beliefs and models. Methodology is often contrasted with methods which are the specific tools and procedures that are used in a particular research endeavor. Methodology involves considerations of the philosophical framework that underpins what and why certain methods are chosen. This framework defines the nature of conceptual reality and other aspects noted in Table 1. It is not right to contrast methodology and method because every methodology will give rise to certain methods germane to that methodology;

therefore, methods are inherent in any methodology. As an analogy, if one is building a house, the architectural plans and residential codes will constitute methodology, whereas the techniques used, for example, laying bricks, setting up drywalls, welding and carpentry works would refer to the method. Table two summarizes the main methodological differences of both approaches.

Table 2
Features of Qualitative and Quantitative Research

Feature	Qualitative (Naturalistic)	Quantitative (Positivist)
Type	Phenomenology, ethnography, case studies, grounded theory, textual analysis,	Experimental designs, surveys
Sampling methods	Purposive, theoretical, snowball, convenience	Probability: random, stratified random, cluster, multistage
Data collection and Analysis	Participant/non-participant observation, open-ended, unstructured, semi-structured interviews, focus group interviews, diaries, testimonies, archived documents, records, notes. Data Analysis: transcription verbatim, content and thematic analysis.	Postal/telephone/online questionnaires, Likert scales. Data analysis: Descriptive and inferential statistics. Coded data entered into statistical packages such as Excel, R, SPSS, SAS, etc.
Confidence	Trustworthiness, confirmability, transferability and credibility	Validity and Reliability. Note: there are many types of validity.
Presentation of findings	Verbatim quotes, categories, themes, metaphors, and conceptual frameworks to aid understanding.	Numerical format tables, graphs and figures to summarize some data to aid understanding.

(After Addo & Eboh, 2014)

In Table 2, phenomenology refers to research that focuses on the lived experience of an individual or a group of individuals to describe the nature of a particular phenomenon: how it was experienced, what was experienced and the meaning that the phenomenon has in the subjective experience of the individual or group. An example of this type of study is one that aims to describe the lived experience of a teacher who teaches severely disabled students. The research involves identifying ontological and epistemological assumptions underpinning the experience. Research based on grounded theory aims to develop knowledge (or a theory) based (or grounded) in actual data in areas that are relatively less researched. For example, a research question such as “what are the perceptions of a dental hygienist in caring for their own families with dental diseases?” could be investigated by research based on grounded theory using interviews as a research method.

Textual analysis which is related to discourse and document analysis involves the identification and interpretation of non-verbal signs for themes. In this context, sign is a rather broad term which includes almost everything that one

encounters or anything that compels one to think about something rather than itself. Vanderstoep and Johnson (2009) as well as Yin (2015) explain types and methods for conducting qualitative research including analysis.

Some reasons for the growing disillusionment of quantitative approaches

The utility of the “scientific model” or positivist-rationalistic approach is manifest in these technology-driven times in tangible ways. Thus, it is not surprising that this approach has guided most educational research efforts for most of the 20th century. However, there was a growing dissatisfaction about the confidence and applicability of such research results. Most educational research is undertaken, as stressed by Wolcott (1985) to guide educational innovation and improvement. An analysis of the educational innovations from the beginning of the twentieth century up until the 1980s, indicate that few developments at school level could be attributed to rationalistic studies. Thus, rationalistic research has failed in its purpose and intent. Almost all the school practice emerged on the bases of experience. This lack of impact of quantitative educational research may be attributed to the banality and triviality of their results. The scientific method, by restricting, simplifying and controlling variables has produced findings and results which are hardly transferable to a real educational setting (Guba, 1982).

Some researchers adopt a quantitative methodology in the belief that one can “build on” the contribution of another. Guba (1982) rejects this notion of aggregability of data or “standing on the shoulders.” He argues that the various hypotheses and theories are characterized by as much conflicting findings as by reinforcing ones: there is no timeless, context-free body of knowledge in educational studies as in the physical sciences.

Another significant weakness in quantitative (rationalistic) research lies in the design of the studies. The rationalistic approach requires such elaborate, artificial settings that ignore the socio-political climate of the research settings (health service areas, schools and the larger society), often it is not possible to carry out the study according to the true scientific model.

In the past forty years, higher education has become massified with enrolments in postgraduate qualifications exceeding traditional enrolment patterns by many orders of magnitude. Many of the students who enroll in postgraduate courses lack sufficient competence in statistical methods causing many of them to undertake qualitative studies for research degrees.

Characteristic Postures of Qualitative Research

Further insight to the gaining popularity of the qualitative or naturalistic approach can be gleaned from a discussion of the characteristic postures assumed by both methods. Guba (1982) identifies six such postures.

Preferred Methods

Guba (1988) contends that the naturalistic (qualitative) methods can preserve chronological flow, maintain contextual validity and generally be more convincing than pages of numbers. The relative underuse of this method in the past may be due to the relative scarcity of information on methodology, especially on analysis. For example, Seiber (in Miles & Huberman, 1984) found well-respected books on case

study methods devoted only 5 — 10 per cent of their pages to the analysis of data. However, in recent years several researchers have largely redressed this imbalance. Guba (1977) clarifies some issues from the late 1970s. Some researchers (Miles et al., 1984) suggest that data analysis in qualitative research is very much an art and one has to depend on intuition as much as on established procedure.

Sources of Theory

While quantitative (positivist) researchers find it impossible to proceed without a priori theory, naturalistic researchers enter the field with an open heart and a seeking mind. They have no a priori theory to prejudice their data collection.

Knowledge Types Used

Naturalistic researchers rely on all types of knowledge including “vibes”, intuitions, apprehensions, and other tacit knowledge. This is made possible by the use of humans as data collecting instruments.

Instruments

The positivists (quantitative researchers) would prefer a non-human instrument for data collection on account of their perceived objectivity, cost and ease of data analysis. Naturalistic researchers prefer humans on account of their greater responsiveness and insightfulness. Guba and Lincoln (1982) bring in the analogy of the “smart bomb”. A smart bomb will find its way to the target even if dropped inaccurately. Similarly, humans as smart data acquisition instruments are able to reach the salient phenomena without preordinate hypothesis.

Design

The naturalistic researcher begins the study without a detailed pre-structured design. The data gathered and the theories conceptualized generate the design and describe the path to be followed in subsequent steps. Thus the design is non-linear and unlike the preconceived structured designs of the experimentalists.

Setting

Wilson (1977) maintains that the setting produces regularities in behavior that often transcends the differences among individuals. For this reason, naturalistic researchers invariably work in the true natural setting of the phenomena being investigated. This is unlike their rationalistic counterparts who prefer controlled contrived settings to exclude all “confounding” variables.

Issues and Problems Facing Qualitative Research

Broadly, the main issues and problems facing naturalistic research can be described under the following headings:

- (a) Boundary problems
- (b) Focussing problems
- (c) Problems of authenticity
- (d) The Triangulation issue
- (e) The Ethical issue

Boundary Problems

The boundary problems are concerned with setting limits to the inquiry, the rules for inclusion and exclusion and the question of relevance. According to Guba (1982) problems emerge when two or more factors interact with each other. The interaction may yield three types of problems namely conceptual, action and value problems. In order to arrive at boundaries he treats the problems in syllogistic terms. The problem is likened to the conclusion of a logical syllogism. Having stated the problems in syllogistic format, the boundaries may be established by considering the propositions (premises) of the inquiry. For example, the researcher could

- (1) document facts asserted in the propositions (documentation mode);
- (2) look for causes of the existing state of affairs (causality mode);
- (3) look for factors that contradict the propositions (contraventional mode);
- (4) determine the consequences if the propositions are not challenged (consequential mode).

Consideration of the propositions in any of these modes places bounds on any naturalistic investigation (Guba 1977).

Focussing Problems

Focussing problems arise in the analysis, categorization and interpretation of output. Guba (1977) identifies two kinds of difficulties in focussing - problems of convergence and divergence. The former is concerned with the development of categories within which data may be assimilated and the latter with collecting additional information to give credence and perspective to the categories developed.

Problems of convergence. Guba (1977) suggests starting the inquiry by looking for concerns and issues. Concerns and issues may emerge due to a number of factors such as moral/ethical, political, legal, etc. Once the issues and concerns are identified the collected data can be categorized. There are no hard and fast rules for categorization. It is largely a matter of intuition. For example, one researcher has successfully used a system of data cards pinned on a board. This method enabled him to shift the cards around easily while forming suitable categories and get an overview of the emerging patterns in a glance.

Guba (1977) advises to look for "recurring regularities". A successful categorization usually exhibits external heterogeneity (dissimilarities of data among categories) and internal homogeneity (similarities of data within groups). If the categories are many and unwieldy, they can be reduced to a manageable size by prioritizing according to salience, uniqueness or other such features. Guba suggests several ways to determine the completion of the categories. They involve notions of the number of unassignable data items, an evaluation of how the category system fits the data, etc.

Problems of divergence. Problems of divergence appears when additional information is needed to give perspective for viewing or evaluation of categories. For example, what methods are to be used when searching for additional information?

Guba suggests three methods as solution: build on the information already known (extension); seek relationships between known information (bridging); and look for new categories implied by the existing ones (surfacing). New information that reinforces/refutes known findings, that surfaces new areas should be sought in giving «flesh» to the study. That sufficient information has been gathered is indicated when data sources yield redundant data and a regular structure is discernible in the available information.

Problems of Authenticity

The traditional criteria of educational research are internal validity, external validity, reliability and objectivity.

Internal validity. Internal validity refers to the extent the data represents what it is supposed to represent. Threats to internal validity arise due to interaction of the researcher and the setting. Guba and Lincoln (1982) suggest several methods of enhancing internal validity: (a) prolonged engagement at the setting to overcome the effects of researcher presence (b) persistent observation to identify salient characteristics (c) peer debriefing to test growing insights against uninvolved peers' (d) triangulation (discussed later) (e) referential adequacy of materials and (f) member checks.

External validity. External validity or generalizability is a non-issue in naturalistic research because each case is considered unique and inextricably tied to the context of the particular case. However, with “thick” description the findings can be generalized to another contextually similar case.

Reliability. Reliability of naturalistic research may be increased by step-wise replication and providing an “audit trail”. Step-wise replication refers to splitting the research problem and seeking independent data collection for later collaboration. An audit trail allows a subsequent researcher to follow the sequence of steps used in arriving at the results.

Objectivity. Threats to objectivity can come from biases, prejudices, incompetence, gullibility and corruptibility. Refined methodologies (Guba & Lincoln, 1982) allow the researcher to maintain a “disciplined” subjectivity that is thorough and intrinsically objective.

The Triangulation Issue

Some researchers have argued that the two research methodologies do not belong to different incompatible and rival camps; that, in fact, they are complementary (Jick, 1979). Such amalgamation of two methodologies is known as “triangulation”. Triangulation has been defined by Denzin (in Jick, 1979, p. 291) as “the combination of methodologies in the study of the same phenomenon”. Jick argues that triangulation allows the researcher to be more confident of the data, particularly if the data collected by different methods converge. Further, triangulation may uncover hidden phenomena. When different techniques yield divergent findings, the need for the researcher to reconcile the data forces him to refine his approach which may lead to the discovery of hidden phenomena. This not only enriches his explanations but also enables him to revise his theories in

the light of new discovery. However, the effectiveness of triangulation rests on the assumption that the weaknesses of one method are compensated by the counterbalancing strengths of the other. If the two methods share the same weaknesses, it would compound the doubtfulness of the study. Some researchers argue that the reliance on multimethod research manifest a lack of confidence in any one method.

The Ethical Issue

In recent years the question of ethics in research has attracted careful consideration. Data collection methods in naturalistic research are rooted in real life situations. The publishing of some case studies may expose the provisors of data to critical appraisal (Adelman et al, 1976). This problem is exacerbated by the fact that the researcher has to establish very personal contacts' to gain access to important data. The multi-faceted problems facing the researcher are stated by Becker (1958, p. 260)

What he has learned in private may be painful to the subjects when immortalized and analyzed in public print? What, and how much, of this ought the researcher to divulge given his indebtedness to the subjects? What are the responsibilities of the researcher to the canons of science, to his subjects, to the general public, and to the future research possibilities of his colleagues?

Adelman et al, (1976) have suggested negotiation and anonymization as possible solutions. However, because of the nature of the naturalistic data, anonymization can make the data unreliable and incredulous to others. Besides, anonymization does not work well for those involved in the study—the very people who have the most to gain or lose.

Further, anonymization implies that the significance of the study is in its generalization and not in the case.

In recent years, an increased awareness of the question of privacy together with a proliferation of research studies based in schools and healthcare settings have made ethics a central issue in qualitative research. Elaborate protocols have been developed to guide the researcher to steer clear from the minefield of ethical issues that may arise from qualitative research, especially when the subjects are not easy to anonymize. Most protocols deal with the right of the individual, obtaining consent of the respondents and maintaining confidentiality, privacy, and anonymity. The generally recommended text books on research (Ary et al. ,2018; Cohen et al. ,2011; Creswell, 2015; Fraenkel & Wallen, 2014) describe many of the caveats in qualitative research in copious detail.

Conclusion

Qualitative or naturalistic research has gained a new prominence in recent decades with a growing dissatisfaction of the positivist approach concurring with refinements in naturalistic methodology. Becker (1958) believes that fewer naturalistic studies have been published in the earlier decades because of the excessive space needed to present the report. Most journals impose strict space

restrictions that preclude these bulky reports from getting published. And unfortunately many curriculum evaluators doubt the quality of the work that does not appear in professional journals. The new refinements give a sense of direction for the researcher to proceed. Focussing and boundary problems no longer restrain the researcher. Guidelines for improving authenticity and managing ethical issues have been put forward. Naturalistic research now appears well poised to make a timely contribution to social science.

Some researchers, both students and established academic staff, take a pragmatic approach when designing studies by incorporating components of quantitative methods in their research to offset any bias against a wholly qualitative study.

References

- Addo, M. & Eboh, W. (2014). Qualitative and quantitative research approaches. In Ruth Taylor (Editor), *The Essentials of Healthcare and Nursing Research* (pp. 137–154). London: Sage Publications Ltd.
- Adelman, C., Jenkins, D. & Kemmis, S. (1976). Re-thinking case study: Notes from the second Cambridge Conference, *Cambridge Journal of Education*, 6,3, 139-150, DOI: 10.1080/0305764760060306
- Ary, D., Jacobs, L.C., Sorensen Irvine, C.K., & Walker, D. (2018). *Introduction to research in education* (10th edition). Boston: Cengage.
- Becker, H.S. (1958), Problems of inference and proof in participant observation, *American Sociological Review*, 23, 1, 245 – 260.
- Cohen, L., & Manion, L. (1980), *Research methods in education*, Croom Helm: London.
- Cohen, L., Manion, L., & Morrison, K. (2011). *Research methods in education* (6th ed.). Routledge/Taylor & Francis Group.
- Creswell, J. W. (2011). *Educational research: Planning, conducting, and evaluating quantitative and qualitative research* (4th ed.). Upper Saddle River, N.J: Merrill.
- Firestone, W. (1987), Meaning in method: the rhetoric of quantitative and qualitative research, *Educational Researcher*, 16, 1, 16 – 21.
- Fraenkel, J. R., & Wallen, N. E. (2014). *How to design and evaluate research in education* (9th ed.). Boston: McGraw-Hill.
- Guba, E.G. (1977), *Toward a methodology of naturalistic Inquiry*, CSE Monograph, UCLA, pp. 42 – 82.
- Guba, E.G., & Lincoln, Y.S. (1982). Epistemological and methodological bases of naturalistic inquiry, *Educational Communication and Technology Journal*, 30, 3, 233 – 252.
- Jick, T.D. (1979). Mixing qualitative and quantitative methods: triangulation in action, *Administrative Science Quarterly*, 24, 1, 602 – 611.
- Miles, M.B. & Huberman, M. (1984). Drawing valid meaning from qualitative data: Toward a shared craft», *Educational Researcher*, 13, 5, 20 – 30.
- Stake, R.E. (1978). The case study in social inquiry, *Educational Researcher*, 17, 2,

5 – 8.

Vanderstoep, S.W., & Johnson, D.D. (2009). *Research methods for everyday life: Blending qualitative and quantitative approaches*. California: Jossey-Bass.

Wilson, S. (1977). The use of ethnographic techniques in educational research, *Review of Educational Research*, 47, 2, 245 – 253.

Wolcott, H.F. (1985). On ethnographic intent, *Educational Administration Quarterly*, 21, 3, 187 – 203.

Yin, R.K. (2015). *Qualitative Research from Start to Finish*. NY: The Guilford Press.