Reliability and Validity of Qualitative and Operational Research Paradigm

Muhammad Bashir
Punjab Education Assessment System
Division of Education, University of Education
Lahore, Pakistan

Muhammad Tanveer Afzal
Division of Education, University of Education
Lahore, Pakistan
Email: mtapk@yahoo.com

Muhammad Azeem
Division of Education, University of Education
Lahore, Pakistan
Email: Knowledge_jhumra@yahoo.com

Abstract

Both qualitative and quantitative paradigms try to find the same result; **the truth**. Qualitative studies are tools used in understanding and describing the world of human experience. Since we maintain our humanity throughout the research process, it is largely impossible to escape the subjective experience, even for the most experienced of researchers.

Reliability and Validity are the issue that has been described in great deal by advocates of quantitative researchers. The validity and the norms of rigor that are applied to quantitative research are not entirely applicable to qualitative research. Validity in qualitative research means the extent to which the data is **plausible, credible** and **trustworthy**; and thus **can be defended when challenged**. Reliability and validity remain appropriate concepts for attaining rigor in qualitative research. Qualitative researchers have to salvage responsibility for reliability and validity by implementing verification strategies integral and self-correcting during the conduct of inquiry itself. This ensures the attainment of rigor using strategies inherent within each qualitative design, and moves the responsibility for incorporating and maintaining reliability and validity from external reviewers' judgments to the investigators themselves.

There have different opinions on validity with some suggesting that the concepts of validity is incompatible with qualitative research and should be abandoned while others argue efforts should be made to ensure validity so as to lend credibility to the results. This paper is an attempt to clarify the meaning and use of reliability and validity in the qualitative research paradigm.

Introduction

This article discusses the use of reliability and validity in the qualitative research paradigm. In the first section of this article, the meanings of quantitative and qualitative research are discussed. Secondly, reliability and validity as used in quantitative research are discussed for facilitating readers and examining what these two terms mean and how they can be tested in the qualitative research paradigm. This paper concludes by recommending ten possible strategies to enhance validity, drawing upon the use of triangulation strategy and to show how

the changes have influenced our understanding of reliability, validity and triangulation in qualitative studies.

Research as defined by many authors (Gay, 1996; Patton, 2001; Creswell, 2003; McMillan and Schumacher, 2006; & Best, 2006) is the systematic application of scientific method to the problem under consideration. Therefore without rigor research become fiction and loses its worth. The rigor can be ensured only by considering validity and reliability in all kind of research methods.

Reliability and Validity in Quantitative Research Paradigm

Quantitative research utilizes experimental methods and quantitative measures to test hypotheses and generalizations are the outcomes of this test. They also emphasize the measurement and analysis of causal relationships between variables (Creswell, 2003 & McMillan and Schumacher, 2006). The meaning of quantitative paradigm of research was explained by Golafashani (2003) as:

Charts and graphs illustrate the results of the research, and commentators employ words such as 'variables', 'populations' and 'result' as part of their daily vocabulary…even if we do not always know just what all of the terms mean…[but] we know that this is part of the process of doing research. Research, then as it comes to be known publicly, is a synonym for quantitative research. (p. 4)

Quantitative researcher(s) familiarizes him/herself with the problem or concept to be studied, and perhaps generate hypothesis (es) to be tested. In this paradigm:

- The emphasis is on facts and causes of behavior (Golafashani, 2003).
- The information is in the form of numbers that can be quantified and summarized.
- The mathematical process is the norm for analyzing the numeric data.
- The final result is expressed in statistical terminologies.

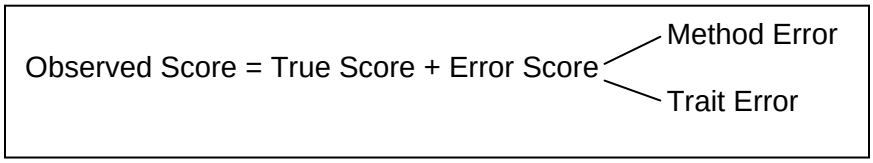
In quantitative paradigm researchers always attempt to delimit phenomena into measurable or common categories that can be applied to all of the subjects (Winter, 2000). Therefore construction of instrument(s), and administration in standardized manner based on the predetermined procedures is the primary requirement of quantitative researchers. But the question is if the measuring instrument measures what it is supposed to measure. In the broadest sense, (Salkind, 1997) the validity of an instrument is on focus.

The most important issue in the research is to ensure reliability and validity. Joppe (2000) defines reliability as: "The extent to which results are consistent over time and an accurate representation of the total population under study is referred to as reliability and if the results of a study can be reproduced under a similar methodology, then the research instrument is considered to be reliable".

Kirk and Miller (1986) identify three types of reliability referred to in quantitative research, which relates to:

- The degree of consistency of results
- The stability over time
- The similarity within a given time period.

Salkind (1997) defines reliability as something that is reliable will perform in the future as it has in the past. A reliable test or measure of behavior can measure the same thing more than once and will result in the same outcome. Reliability is based on the scores, performance of any one on any variable generate a score composed of three components shown below.



Adopted from Salkind (1997)

The consistency of the questionnaire [Test] items score remains same can be determined using split half, test-retest or parallel form methods, this characteristic of the instrument is stability. Dealing stable measure results in same answers over and over. The degree of stability is positively correlated with the degree of reliability, higher degree of stability results in higher degree of reliability, means that the results are repeatable Charles (1995).

The researcher may improve the research instrument through repeatability and enhance its internal consistency, and, therefore reliability, during that process researcher might revise or delete the questionnaire [test] items to improve the reliability but this may affect the validity of the instrument, and the major concern here is to what extent the revision affected the table of specification.

Validity determines whether the research truly measures that which it was intended to measure or how truthful the research results are. Golafashani (2003) describe the validity in quantitative research as “construct validity”. The construct means question concept, notion, or hypothesis, which forms the basis for the researcher data collection and sampling designs, consistent with the construct.

In so far as the definitions of reliability and validity in quantitative research reveal two strands: Firstly, with regards to reliability, consistency, stability and predictability (synonyms for reliability), whether the result is replicable. Secondly, with regards to validity, truthfulness, accuracy, authenticity, genuineness, or soundness (Synonyms for validity), whether the means of measurement are accurate and whether they are actually measuring what they are intended to measure (Salkind, 1997).

However, the concepts of reliability and validity are viewed differently by qualitative researchers who strongly consider these concepts defined in quantitative terms as insufficient. In other words, these terms as defined in quantitative terms may not apply to the qualitative research paradigm (Golafashani, 2003).

Qualitative Research Paradigm

Denzin and Lincoln (1994) viewed qualitative research as a field of inquiry in its own right. It crosscuts disciplines, fields, and subject matters. A complex, interconnected family of terms, concepts, and assumptions surround the term qualitative research.

Golafashani (2003) described qualitative research uses a naturalistic approach that seeks to understand phenomena in context-specific settings, such as real world setting in which the researcher does not attempt to manipulate the phenomenon of interest and only try to unveil the ultimate truth.

An initial definition provided by Denzin and Lincoln (1994) adheres that qualitative research is multi-method in focus, involving an interpretive, naturalistic approach to its subject matters. This means that qualitative research study things in their natural settings, attempting to make sense of, or interpret phenomena in terms of the meanings people bring to them.

It tries to produce findings not based on the statistical principles and formulae that is quantification is not involved in qualitative research. It takes place in natural setting. The qualitative researcher often goes to the site of the participant, enabling to develop a level of details about the individual or place to be highly involved in actual experiences of the participants.

Qualitative research involves the studied use and collection of a variety of empirical materials (case study, personal experience, introspective, life story, interview, observational, historical, interactional, and visual texts) that describe routine and problematic moments and meaning in individuals' life.

Therefore these methods like interviews and observations are dominant in the naturalist (interpretive) paradigm and supplementary in the positive paradigm, where the use of survey serves in opposite order.

However, both qualitative and quantitative researchers need credibility of the research. The credibility of a qualitative research depends on the ability and effort of the researcher. This is also viewed as the validity and reliability in qualitative research, these terms are not viewed separately in this qualitative research paradigm. Instead, terminology that encompasses both, such as credibility, transferability, and trustworthiness is used.

Reliability and Validity in Qualitative Research

To understand the meaning of reliability and validity, it is necessary to present the various definitions of reliability and validity given by many qualitative researchers from different perspectives.

Reliability

The term 'Reliability' is a concept used for testing or evaluating quantitative research, the idea is most often used in all kinds of research. The idea of testing in qualitative paradigm is viewed as a way of information elicitation. Therefore most important test of any qualitative study is its quality. A good qualitative study can help us to "understand a situation that would otherwise be enigmatic or confusing" (Eisner, 1991). Stenbacka, (2001) viewed reliability as "purpose of explaining" in quantitative approach and "generating understanding" in qualitative approach to research. The difference in purposes of evaluating the quality of studies in quantitative and qualitative research is one of the reasons that the concept of reliability is irrelevant in qualitative research. According to Stenbacka, (2001) "the concept of reliability is even misleading in qualitative research, if a qualitative study is discussed with reliability as a criterion; the consequence is rather that the study is no good".

On the other hand, Patton (2001) puts three questions for the credibility (validity and reliability) of the qualitative research:

- What techniques and methods were used to ensure the integrity, validity and accuracy of the findings?
- What does the researcher brings to the study in terms of experience and qualification?
- What assumptions undergrid the study?

These questions may be used as guide for writing up narrative.

The most suitable terms in qualitative paradigms are Credibility, Neutrality or Confirmability, Consistency or Dependability and Applicability or Transferability (Lincoln & Guba, 1985). To be more specific with the term of reliability in qualitative research, Lincoln and Guba (1985) used "dependability", in qualitative research which closely corresponds to the notion of "reliability" in quantitative research. They further emphasize "inquiry audit" as one measure which might enhance the dependability of qualitative research. In the same layer, Clont (1992) and Seale (1999) endorse the concept of dependability with the concept of consistency or reliability in qualitative research. The consistency of data will be achieved when the steps of the research are verified through examination of such items as raw data, data reduction products, and process notes (Campbell, 1996).

To ensure reliability in qualitative research, examination of trustworthiness is crucial. Seale (1999), while establishing good quality studies through reliability and validity in qualitative research, states that the "trustworthiness of a research

report lies at the heart of issues conventionally discussed as validity and reliability". When judging qualitative work, Strauss and Corbin (1990) suggest that the "usual canons of 'good science'…require redefinition in order to fit the realities of qualitative research".

In contrast, Stenbacka, (2001) argues that since reliability issue concerns measurements then it has no relevance in qualitative research. She adds the issue of reliability is an irrelevant matter in the judgment of quality of qualitative research. To widen the spectrum of conceptualization of reliability and revealing the congruence of reliability and validity in qualitative research, Lincoln and Guba (1985) states that: "Since there can be no validity without reliability, a demonstration of the validity is sufficient to establish the reliability". Patton (2001) with regards to the researcher's ability and skill in any qualitative research also states that reliability is a consequence of the validity in a study.

Validity

Three approaches to validity in qualitative research are validation as investigation, as communication, and as action (Kvale, 1989). Researchers rely upon experience and literature to address the issue of validity, generalizability, and reliability. It is specified in quantitative paradigm but confusing in qualitative one. In qualitative research validity has to do with description and explanation, and weather or not the given explanation fits a given description.

Qualitative researchers are of the view that the term validity is not applicable to qualitative research, but at the same time, they have realized the need for some kind of qualifying check or measure for their research. For example, Creswell & Miller (2000) suggest that the validity is affected by the researcher's perception of validity in the study and his/her choice of paradigm assumption. As a result, many researchers have developed their own concepts of validity and have often generated or adopted what they consider to be more appropriate terms, such as, quality, rigor and trustworthiness (Davies & Dodd, 2002; Lincoln & Guba, 1985; Seale, 1999; Stenbacka, 2001).

The issue of validity in qualitative research has not been disregarded by Stenbacka (2001) as she has for the issue of reliability in qualitative research. Instead, she argues that the concept of validity should be redefined for qualitative researches. Stenbacka (2001) describes the notion of reliability as one of the quality concepts in qualitative research which "to be solved in order to claim a study as part of proper research".

In searching for the meaning of rigor in research, Davies and Dodd (2002) find that the term rigor in research appears in reference to the discussion about reliability and validity. Davies and Dodd (2002) argue that the application of the notion rigor in qualitative research should differ from those in quantitative research by "accepting that there is a quantitative bias in the concept of rigor, we now move on to develop our re-conception of rigor by exploring subjectivity, reflexivity, and the social interaction of interviewing".

Lincoln and Guba (1985) argue that sustaining the trustworthiness of a research report depends on the issues, quantitatively, discussed as validity and reliability. The idea of discovering truth through measures of reliability and validity is replaced by the idea of trustworthiness, which is “defensible” and establishing confidence in the findings (Lincoln & Guba, 1985).

If the issues of reliability, validity, trustworthiness, quality and rigor are meant differentiating a 'good' from 'bad' research then testing and increasing the reliability, validity, trustworthiness, quality and rigor will be important to the research in any paradigm.

Ensuring Validity and Reliability

So far, when ever the researcher addressed the concepts of reliability and validity in qualitative research they referred credibility, the question arises here that how to enhance credibility of the research?

In this regard Golafashani (2003) if the validity or trustworthiness can be maximized then more credible and defensible result may lead to generalizability which is one of the concepts suggested by Stenbacka (2001) as the structure for both doing and documenting high quality qualitative research. Therefore, the quality of a research is related to generalizability of the result and thereby to the testing and increasing the validity or trustworthiness of the research.

McMillan & Schumacher (2006) stated that validity refers to the degree of congruence between the explanations of the phenomena and the realities of the world. Disagreement occurs between the names of specific concepts; reflexivity and extension of findings are the other words that can be used in this regard. To answer the question of enhancing validity they argued that continuous refinement of the sampling and data collection techniques through out the data collection process increase the validity.

In contrast, Golafashani (2003) presented another view that the degree to which an account is believed to be generalizable is a factor that clearly distinguishes quantitative and qualitative research approaches.

In qualitative studies multi-method approaches has been employed by the researcher towards the generalizability of the research that is to enhance the reliability and validity of the research. Researcher bias can be minimized if the researcher spends enough time in the field and employ multiple data collection strategies to corroborate the findings.

Many researchers (McMillan & Schumacher, 2006; Lincoln & Guba, 1985; Seale, 1999; Stenbacka, 2001) agreed that triangulation is typically a strategy for improving the validity and reliability of research or evaluation of findings.

Mathison (1988) elaborates this by saying: Triangulation has raised an important methodological issue in naturalistic and qualitative approaches to evaluation in

order to control bias and establishing valid propositions because traditional scientific techniques are incompatible with this alternate epistemology.

Patton (2001) believes the use of triangulation by stating "triangulation strengthens a study by combining methods. This can mean using several kinds of methods or data, including using both quantitative and qualitative approaches". However, the idea of combining methods has been challenged by Barbour (1998). She argues while mixing paradigms can be possible but mixing methods within one paradigm, such as qualitative research, is problematic since each method within the qualitative paradigm has its own assumption in "terms of theoretical frameworks we bring to bear on our research". Even though triangulation is used in quantitative paradigm for confirmation and generalization of a research, Barbour (1998) does not disregard the notion of triangulation in qualitative paradigm and she states the need to define triangulation from a qualitative research's perspective in each paradigm.

Golafashani (2003) presented constructivism is another paradigm in qualitative research that views knowledge as socially constructed and may change depending on the circumstances. Constructivism in social perspective is defined as the view that all knowledge and therefore all meaningful reality, is contingent upon human practices, being constructed in and out of interaction between human beings and their world, and developed and transmitted within an essentially social context.

According to this view as the reality is always changing and remaining in contact with one strategy in the ever changing world is not meaningful. Therefore, to acquire valid and reliable multiple and diverse realities, multiple methods of searching or gathering data are in order.

This calls towards the triangulation in one sense and reflexivity in McMillan & Schumacher (2006) point of view as strategies for enhancing validity. Creswell (2003) described that by triangulate it means that use different data sources of information by examining evidence from the sources and using it to build a coherent justification for themes. Whereas reflexivity is rigorous self scrutiny by the researcher through out the research process and is an important procedure for establishing credibility.

Engaging multiple methods, such as, observation, interviews and recordings will lead to more valid, reliable and diverse construction of realities. To improve the analysis and understanding of construction of others, triangulation is a step taken by researchers to involve several investigators or researchers' interpretation of the data at different time or location. In a related way, a qualitative researcher can "use investigator triangulation and consider the ideas and explanations generated by additional researchers studying the research participants" (Johnson, 1997).

Reliability and validity are conceptualized as trustworthiness, rigor and quality in qualitative paradigm. That can be achieved by eliminating bias and increasing the researcher's truthfulness of a proposition about some social phenomenon using triangulation. The qualitative researchers use combination of strategies from the list of following ten recommended by (McMillan & Schumacher, 2006).

List of Strategies to Increase Validity in Qualitative Research Paradigm

Sr. #	Strategy	Description
1	Prolonged and persistent field work	Allows interim data analysis and corroboration to ensure match between findings and participants reality
2	Multi-method strategies	Allows triangulation in data collection and data analysis
3	Participant language verbatim accounts	Obtain literal statements of participants and quotations from documents
4	Low-inference descriptors	Record precise, almost literal, and detailed descriptions of people and situations
5	Multiple researchers	Agreement on the descriptive data collected by the research team
6	Mechanically recoded data	Use of tape recorders, photographs, and videotapes
7	Participant researcher	Use of participants recorded perceptions in diaries or anecdotal records for corroboration
8	Member checking	Check informally with participants for accuracy during data collection frequently done in participant observation studies
9	Participant review	Ask participants to review researcher's synthesis of interviews with person for accuracy of representation frequently done in interview studies
10	Negative or discrepant data	Actively search for record, analyze, and report negative or discrepant data that are an exception to patterns or that modify patterns found in data

Conclusion

Qualitative research seeks to understand, as completely as possible, the phenomena under study. Ethnographic research has qualitative goals of complete understanding, but interacts with research subjects, in their own

setting, to come to that understanding. There are a variety of methods qualitative researchers' uses: they collect data through observation, interviews, and records investigation. However, while many in the hard sciences view qualitative research as "easy," or not rigorous enough, qualitative researchers do in fact strive for reliability and validity in their findings.

It is concluded that the claim of validity rests on data collection and analysis techniques and instrument, the researcher in qualitative paradigm.

In this paper we have tried to explain the concept of validity and reliability in qualitative paradigm in association with quantitative paradigm so that the reader can easily grasps the concepts. A more meticulous approach is need to ensure the so far called validity of the qualitative research, any combination of the suggested strategies can serve the purpose still the selection of the combinations need care and attention.

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