RELIABILITY QUESTION IN SOCIAL SCIENCE RESEARCH: EXPLORING THE MIXED METHODS APPROACH

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Abstract
In social inquiry, some researchers collect and analyse data quantitatively, while others prefer qualitative methods, depending on the suitability of each approach to social evaluations. However, the complexities of contemporary social inquiry and the demand for validity, reliability and replicability require that, to enrich data and reduce expected deficiencies, a synergy of approaches suffices. The paper examined the emerging paradigm shift towards a combination of approaches in an attempt to gather and analyse data in social research, with special focus on the reliability question as well as the alternative method that can suitably answer it. For purpose of application, a research was undertaken to study the rationale behind mass failure of Wesley University students in a course in two sessions. To this end, data were gathered using both primary and secondary sources and analysed using mixed methods, specifically parallel data triangulation. The research found that the process followed in evaluation can be improved upon by blending both methods as this ensures that the limitations of a technique can be recompensed for by the strong point of the other, and this will consequently make the outcome reliable by integrating different ways of knowing. It then recommended that, due to the complexities of social research and the need for improvement of evaluation, mixed method approach offers the best way out.
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Introduction

There are several meanings associated with research, because there are various kinds. It could be understood as an intellectual study, analysis, trial, or investigation aimed at unearthing and understanding details, revising established notions or laws in relation to new truths, or applying such theories or laws in the actual world. (Jennifer Greene, 2019). Thomas (2011) defines it as a methodical approach to problem-solving and learning new information. Regardless of how it is created, a research is the procedure for locating trustworthy solutions to issues by the deliberate and methodical data collecting, analysis, and interpretation. (Osuala, 2005). What is very paramount in the analysis of any scientific findings is the process or method; that is, whether it conforms to acceptable standard or otherwise, and this serves as the yardstick for measuring the conclusions therein.

The framework of public research arrangements entails keeping everything in mind, including how expectations about the nature of the collective sphere as well as the way information about it is formed, the significance of assumptions about these assumptions, the importance of principles, especially moral considerations, and the routines at which governmental concerns concede possibility happen in social research (Alan, 2012). The topic of what is considered to be acceptable information in a training is an epistemological one (Bryman, 2008). The topic of whether social

science may and should be intentional in accordance with the identical legislation, methodology, and ethos as the regular sciences is a particularly important one in these unique circumstances. The position that ratifies the significance of copying the instinctive sciences (Bell, 2016).

An alternative epistemology to optimism is what is referred to as interpretivism. The term encompasses the opinions of authors who oppose using the controlled model to investigate the social environment and the one that has been influenced by different intellectual habits. They both hold the opinion that the friendly sciences community's and their organizations' themes are essentially dissimilar from those of the conventional science. Therefore, the learning of social science calls for a unique study rationale that contrasts the everyday order with the individuality of people. (Von Wright, 1971).

There are two major approaches that researchers adopt in any scientific study, such as qualitative and quantitative methods, and the choice of either approach speaks volume about the findings thereafter. For instance, The qualitative approach places emphasis on examining and comprehending the meanings that individuals or groups assign to social or human problems, or Putting problems within the context of one's own particular circumstance can help one gain perspective on them. Quantitative researchers, on the other hand, think that there is an independent, unbiased truth that subsists outside of themselves. They argue that this reality may be understood by making observations, testing, and replicating hypotheses about the relationships between variables since it has been divided into easier-to-study components. While the former is an inductive approach, the latter is a deductive approach.

Ever since the beginning of the clamour for the adaptation and use of research methods in the natural sciences to social science inquiries, there have been dedicated efforts aimed at finding a suitable balance between qualitative and quantitative research methods respectively**.** Although, Willig (2013) contends that there are both correct and incorrect ways to do research, natural researchers are often critical of the qualitative method approach, citing many observable defects inherent in it, such as inherent subjectivity, clandestine process, environmental or sociological bias, irreplicability of process and involving non-representative sample, a good ground for overgeneralisation of findings. The positivist stance on qualitative methods approach is utter rejection of whatever findings therein for lacking universal acceptability. On the other hand, the qualitative researchers accuse the positivists of over-reliance on instruments and procedures, and that they frequently fail to discern between the world of nature and that of humans and social organizations.

It is arguably true that research in natural sciences is not the same as in social sciences, due mainly, to the fact that the former deals with natural phenomenal and objects, which can be subjected to personal control or laboratory test and experiments, while the latter often conduct inquiries on (mostly) human subjects that

cannot be confined within a laboratory. Also, most of the subjects of research in natural sciences are not cognitive being, unlike humans in social research, who are capable of understanding the end of the research and second guess on what a researcher is expecting of them. Irrespective of these facts, the positivists believe that facts should be subjected to quantitative analysis, so as to guarantee universality of findings since it will be replicable as a result of open, valid and measurable data.
This work is geared towards exploring an alternative approach that is capable of bridging the gap created as a result of the deficiencies with regard to both methods; and which can create a synergy of both approaches, so that the deficits in one can be complemented by the strength in the other approach. A mixed methodology approach is a style of empirical investigation that incorporates features of both research techniques with the overarching goals of corroboration and depth of understanding. Qualitative and quantitative facts must be gathered and analyzed. (Johnson, B. et al, 2007:23). This work will begin with the review of literature on qualitative, quantitative and the mixed methods procedures and then, present the study discoveries, decision and recommendations.

Also, the work would adopt a case-study, where the mixing methods would be tested to find its veracity in social science research. To this end, the researcher will conduct a research into mass failure in a course for two consecutive sessions in Wesley University to find out the applicability of the approach to social enquiries. This research work is tailored to find a balance between doing a research and ensuring the process is reliable, especially regarding the degree at which the results can be replicated under the same circumstances.

Review of Related Literature

Social Research

This investigation was carried out by social scientists according to a well-organized plan. It uses concepts, theories, and methods from social science that can help us better understand the social problems and processes that affect both individuals and groups in society. There are other factors involved as well, such as using common sense, facts rather than theories, one's own life experience, or repeating media clichés. Sociologists, psychologists, economists, political scientists, and anthropologists carry out the research. Social investigation is the study of people and values, which is often used to identify recurrent forms in social existence. It could be defined as the systematic comprehension of societal truths or events. It is used to collect data about society so that a course of action can be developed.

Ontological Considerations

In social ontology, the nature of social entities is a debating point. The main issue at hand is if social investigators can and should be viewed as objective things with a

reality distinct from social players, or if they are capable of and should be well-thought-out as social constructs generated through the observations and behaviours of social players. The traditional titles for these ideas are objectivism and constructionism. About two among the utmost important and commonly used concepts in social science, association and values, can be used as examples to show how they differ from one another.

Objectivism

According to the ontological perspective known as objectivism, social phenomena are unchangeable, objective facts. A group may be described as a physical object. It is ruled by laws and regulations. It performs activities via established procedures. People are given employment as part of a division of labour. There is a hierarchy. Its purpose is made clear. and so on. Thinking in these terms tends to give rise to the notion that an organization has a reality that is distinct from the people who occupy it, even though the degree at which the traits subsist varies from one group to another.

Furthermore, because it forces people to comply with its demands, the organization exemplifies a social order. People are taught the laws and regulations and follow them. They adhere to the prescribed practices. They execute the tasks that have been given to them. People instruct them in what to do, and they instruct others. They are taught and put into practice the ideals of the operation declaration. Failure to follow the instructions, they can receive criticism or possibly be fired. For this reason, the organization works as a restraint on and inhibitor of the adherents.

Constructionism

According to the ontological view known as constructionism (also known as constructivism), social actors continuously create social phenomena and their meanings. It implies that in addition to being formed through social interaction, social phenomena and categories are always being changed. The notion that academics' views of the collective world are constructs has also been part of the phrase in recent years. On the other hand, the investigator never offers a generalized account of group actuality that can be taken as the final word. The idea that knowledge is unknowable is prevalent, and it is reminiscent of postmodernism. Ontological constructionism is typically associated with this use of the term.

On the other hand, these meanings are connected. Although the second interpretation also rejects realism, both interpretations are opposed to objectivism. Both the first and second meanings could be correctly understood as constructionism in terms of the social realm and the sort of its knowledge, respectively (and indeed the natural world). Though it is increasingly being incorporated into conceptions of constructionism vis-a-vis the kind of awareness about the social domain, it is offered as an ontological perspective in connection with societal matters and groupings, especially, one that considers them to be socially created.

Relationship to Social Research

Social ontology questions are inextricably linked to problems with how social research is done. The methods through which study interrogations are created and investigation is conducted will be influenced by ontological commitments and assumptions. If a study question is framed in a way that implies cultures and organizations are objective social entities that influence people, a researcher is more inclined to accentuate the official qualities of groups or members' attitudes and beliefs. On the other hand, if the investigator develops a study topic that highlights the precariousness of group and ethos as impartial groupings, a focus will probably be focused on the active participation of individuals in reality formation. It is reasonable to suppose that multiple techniques for data collection and research design will be required in both cases.

It is often important to make a dissimilarity between approaches when writing about methodological concerns. The distinction has an unclear status because it is nearly simultaneously considered a basic contrast by some writers and no longer has any meaning by others. or maybe just "wrong" (Layder 1993:110). There is, however, plenty of evidence for the distinction's sustained, if not increasing, value and little evidence to imply that its use is declining. The difference between both approaches will be deployed extensively in this study because it offers a useful framework for categorizing various social research methodologies and because it serves as a handy catch-all for a variety of concerns about the practice of social research.

The quantitative-qualitative gap appears to be mostly driven by the different ways that quantitative and qualitative researchers employ measurement. Undoubtedly, researchers have a tendency to think in these terms, but a number of authors have theorized that the differences go beyond the apparent issue of whether or not quantification is used. Numerous scholars contend that there are distinctions between both research, both in terms of the underlying epistemologies and in other respects. In fact, if we take into account the theory-research relationship, phenomenology concerns, and existential concerns, we might view both research strategies as two separate clusters of research method.

Qualitative Methodology

It asks open-ended, general questions, primarily uses participant words (or text) to gather information, characterizes and analyzes these words for themes, and conducts the research in a biased, subjective way. It was characterized by constructivism as having many realities, biased, and/or inductive. Sometimes, to use Shulman's words, we want to know "exactly how," not "how many" or "how well" (1998:7). For example, what factors affect a graduate student's decision to enroll in an online research techniques course? In most cases, this means listening to what the participants have to say while simultaneously subjecting the data to analytical

induction, such as searching for recurrent themes. It has a more experimental nature. The examples of qualitative data collection methods are interviews, open-ended questionnaires, observations, content analysis and focus groups.

Qualitative research often prioritizes language over quantitative when gathering and interpreting data. Although qualitative researchers don't necessarily concur with all three of these traits, inductivist, constructionist, and interpretivist methodologies are frequently used in their study. Sometimes the term "qualitative research" is used to describe a social science research technique that does not collect or offer quantitative data. Numerous scholars who have written about it have criticized this view of qualitative research since it does not adequately capture what makes it distinctive. In qualitative research, there have been many diverse traditions and viewpoints over the years.

Qualitative and quantitative research's distinctions are occasionally brought up while talking about the former. This strategy may have the drawback of framing discussions of qualitative research with regards to what measureable research is not.

Types of Qualitative Research

Research in social science is frequently classified as either qualitative or quantitative. While quantitative research looks for facts shared by defined groups, qualitative research concentrates on social conduct going by the perspective of a member. Organizational structures in industry, education, and government frequently employ six different qualitative research types, which are phenomenological, ethnographic, grounded theory, case-study, historical and narrative methods.

Methods of Qualitative Research

Findings from qualitative research are gathered through a range of techniques, and when doing a qualitative study, a researcher will frequently employ at least two or more of the following:

Survey: This is done to find out what respondents think and believe about a certain subject or event. There are two types of surveys: longitudinal surveys and cross-sectional surveys. A questionnaire that investigates students' online search experiences is an illustration of a cross-sectional survey. In contrast, In contrast to a snapshot survey, a longitudinal study would look at changes in students' experiences over time. Open-ended The phrase "survey" also implies that many surveys also include open-ended questions that permit the creation and analysis of qualitative data, even though many surveys are designed to yield quantitative data. In this way, participants are free to respond to research questions in-depth or elaborately.

Focus Groups: A focus group is a qualitative evaluation method that involves interviewing a number of people. The proper management of these group interviews is taught to focus group moderators. Focus group market researchers can fully

comprehend participants' opinions and perceptions on a variety of topics as well as their thoughts on a new product.

Interviewing: A qualitative research technique called an interview is used to collect data from subjects in a one-on-one environment. In order to obtain understanding of participants' perceptions, a more intimate style of study is used. The interview's private setting may make it easier to get candid feedback and impressions from participants. Additionally, it requires additional time and resources to do the research.

The Major Stages of Qualitative Research

- Broader research issues
- Choosing a pertinent location or subject;
- gathering pertinent data;
- interpreting that data;
- gathering further pertinent data;
- conceptual and theoretical works; and
- writing up results and conclusions. (Allan Bryman, 2012)

Critiquing the Qualitative Research Methods

- Qualitative research is too subjective
- Difficult to replicate
- Problems of generalizatio
- Small Sample
- Time consuming and expensive
- Lack of transparency

Quantitative Method

This kind of research involves selecting the subject matter to investigate, formulating focused, precise questions, gathering quantitative information from a sizable number of participants, utilizing statistics to analyze the data, and conducting the study in a neutral, unbiased manner. Post-positivism is an objective, deductive theory of a single reality. Questions on any efforts to quantify factors of interest should generally be measurable. What connection exists between the number of 'hits' generated by graduate students during a course on online research techniques and their grade in that course? It is described as a choice for the normal scientific method (particularly, the positivism), the gathering of statistical facts, a deductive understanding of the connection between model and study, and, in very general terms, a value-free idea of social actuality. (Alan Bryman, 2012). Typically, it involves gathering numerical data that can be statistically analyzed. Techniques for gathering information include surveys, questionnaires, performance reviews, and personality tests.

The Process of Quantitative Research

Alan Bryman (2012) listed eleven (11) steps to follow in any quantitative research endeavour, and they are as follow:
Theoretical underpinnings, choice of hypothesis, research design, instrument, concepts measures, selection of research respondents, administering research instrument, collecting data, processing, analysing, and writing up of findings and conclusions

Objectives of Quantitative Research

Both research types are understood as showing a set of distinct but conflicting concerns. These reservations epitomize thoughts with an epistemic basis about the appropriateness of knowing. Below is an outline and examination of the four core issues that are found in this research type: measurement, causality, generalization, and replication.

Measurement

Given how much has been said, it is not surprising that measurement is the obsession that is most visible. Measuring data has a lot of advantages in quantitative research. Therefore, even though this is not always reflected in the actual study, it is not surprising that validity and reliability issues are a worry for researchers using this method.

Causality

The majority of quantitative researches have a significant problem about explanation. They are hardly content to simply illustrate the way issues are and are eager to expound the reason things are the way they are. The concentration is generally seen as a feature of the realities in the natural sciences. Because of this, it is usual for researchers to be interested in more than just defining a phenomenon like racial prejudice, such as how much prejudice happens within a given cluster of individuals or what proportion of a sample is extremely biased and what ratio is mostly free of preconception. Rather, they perhaps attempt to clarify it, and this necessitates prodding into its core motives. In an effort to explain racial bias, the researcher may use either social or personal factors, such as levels of authoritarianism (for instance, learning or experiences of social mobility). When writing research reports, the phrases "independent" and "dependent" variables are frequently employed, reflecting the tendency to see the world from causes and effects perspectives. Racism can be viewed as the dependent variable that requires explanation, whereas authoritarianism can be understood as the independent variable which causally impacts bias.

Generalization

During the conduct of quantitative research, the investigator often wishes to have the ability to assert that the outcomes may be generalizable to other situations. Therefore, they habitually wishes to stress that the results might not be appropriate to the

research participants, especially when a study of tribal bias is carried out, utilizing a survey with a wide several participants. When the topic of how to choose a representative sample is regularly discussed in social survey research, this concern becomes evident. Since it is hardly realistic to refer surveys to or interview entire populace (like the entire population of a settlement, a country, or all members of an organization), we must instead rely on smaller samples. This will allow us to assert that the outcomes are not specific to the cluster on which they conducted the investigation. The obsession with generalization might be seen as an effort to convert the natural sciences' results into laws.

Replication

Typically, the natural sciences are characterized as wanting to decrease the polluting impact of the researcher's beliefs and values. The researcher's individual characteristics, expectations, or anything else should not have an impact on the research findings. The pervasion of biases and a lack of objectivity would seriously call into question the natural sciences' claims to provide a comprehensive picture of the world. In an effort to mitigate the effects of these possibly detrimental issues, researchers may attempt to reproduce; that is, to repeat experiments of others. Failing to duplicate, which makes it unable to consistently recreate the findings, would raise serious questions about the validity of a scientist's conclusions. As a result, scientists frequently attempt to replicate experiments in order for them to be very specific about their methods. Similar to this, replication—or more specifically, the capacity for replication—is frequently seen by quantitative social scientists as a crucial component of their work.

Critique of Quantitative Research

- Inability to distinguish between the realm of nature and people and social group
- The measurement method exudes an illusory sense of accuracy and precision
- The dependence on tools and procedures obstructs the application of research to real-world problems
- A static, detached image of social life is produced by the study of relationships between variables

Difference between Qualitative and Quantitative Methods

Qualitative Research

Exploratory research constitutes the bulk of qualitative research. It is employed to comprehend the underlying causes, viewpoints, and intentions. It offers understanding of the issue or facilitates the creation of theories or concepts for possible quantitative investigations. To go deeper into the issue and identify trends in attitudes and cognition, qualitative research is also employed. There are numerous techniques to gather qualitative data utilizing semi- or unstructured methods. Individual interviews, focus groups (group talks), and participation/observations are

a few common techniques. In most cases, a relatively small sample size is used, and respondents are chosen to meet a particular requirement.

Quantitative Research

By producing numerical data or data that may be converted into useful statistics, quantitative research is utilized to quantify the issue. In order to generalize the results from a larger sample size, it is used to quantify attitudes, views, actions, and other specific elements. Quantitative research discovers facts and detects trends in the topic of study using quantifiable data. Quantitative data is gathered using somewhat more strict approaches than qualitative data. Numerous survey formats, such as online, print, mobile, and kiosk surveys, face-to-face and telephone interviews, longitudinal studies, website interceptors, online polls, and systematic observations are used to collect quantitative data.

Reliability Issue in Social Research

Reproducibility of a study's results is what reliability is all about. When discussing the issue of the consistency of measures created for social scientific topics, the expression is widely used (such as poverty, racial prejudice, deskilling, and religious orthodoxy). Reliability issues are particularly prevalent when it comes to quantitative research. The question of a measure's stability is one that the quantitative researcher is likely to be interested in. After all, we would be concerned if IQ tests, which were meant to be gauges of intellect, were shown to fluctuate to the extent that people's IQ scores routinely altered significantly when taken on two or more occasions. It would be viewed by us as an erroneous measurement as we could not have faith in its consistency. It refers to the consistency of a measure. There are two types of consistency: over time (test-retest reliability) and across items (internal consistency).

Test-Retest Reliability: The findings should hold true over time when researchers measure a construct they believe will remain constant. The validity of this claim is established by test-retest reliability. Consider the widely held belief that IQ doesn't change over time. The intelligent person of today will still be intelligent next week. This implies that this person ought to get around the same outcomes on any reliable IQ test next week as they do right now. It should be obvious that a measure that constantly yields scores that are extremely erratic cannot be a very useful indicator of a construct that is intended to be reliable. The correlation coefficient is calculated when the scatterplot of the data has been created. The must be distributed to a group in order to determine the test-retest reliability. The test-retest correlation between the two sets of scores must also be examined. This is frequently done by plotting the data in a scatterplot and figuring out the correlation coefficient.

Internal Consistency: Internal consistency, or the consistency of respondents' responses on a multiple-item test, is another type of reliability. People's scores on such things should be related to one another because all the items on such measures are often made to reflect the same underlying concept. People who feel deserving of respect generally concur that they have a lot of positive traits, according to the Rosenberg Self-Esteem Scale. It would be impossible to assert that responses to the various elements are all evaluating the same underlying concept if the responses to the various elements are unrelated to one another. This is supported by self-reporting data as well as behavioral and physiological assessments. You can assess someone's risk tolerance by observing them place a series of bets in a simulated roulette game. If a person consistently put high or low bets throughout the trials, this metric would be internally consistent. (Alan, B. 2012).

The validity and reliability standards should be able to be met by any design chosen for social research. Most of the time, using only one approach almost always results in this, prompting the need for a thorough alternative—mixed methods. Although the qualitative approach is based on the observation and partly subjective analysis of events, it does not have the capacity for test-retest reliability. This is true even if it provides important insights into the motivations behind social actions. The fact that quantitative approaches do not ensure replicability across different disciplines works against their superiority to qualitative methods because it reduces social difficulties to a case that is external to the researcher and is easily measurable. In this instance, an alternative that seems to best guarantee reliability criterion is the mixed methods.

Mixed Methods Approach

Understanding the context from which the research is directed requires improving data reliability, validating findings, and expanding our comprehension of the processes used to achieve project results and impacts, as well as how these are impacted by the environment in which the research is conducted. Jennifer Greene (2007) defined mixed-methods design as the systematic integration of quantitative and qualitative research methodologies in all stages of social inquiry. According to Michael (2014), the term "mixed methods" refers to an assessment methodology that consistently combines quantitative and qualitative techniques and approaches at all stages of an evaluation. It is clear that Michael emphasizes the necessity of methodically integrating quantitative and qualitative methodologies (rather than applying them one after the other) at every level of the review (not just in data collection).

Howard White (2009) He defines mixed approaches as combining counterfactual analysis with factual analysis, which can be quantitative or qualitative, and does it from a somewhat different perspective. In this instance, the mixed mode of analysis is not the techniques. Other researchers in this subject go one step further and define

mixed methods as a fundamental and intentional effort to harmonize two extremely dissimilar scientific perspectives. A more recent work offers remarkable insight into the resolution of the qualitative and quantitative perspectives. He continued by saying that in the current push for rigor in social research, a mixed methodologies approach, which ensures policy relevance, must not be sacrificed. To the point where it is very challenging to unravel the program theory and interpret quantitative results without using qualitative data, in-depth qualitative work can help shape the evaluation questions and data collection instruments. This allows the question of why an intervention worked (rather than just if it did) to be addressed.

The systematic blending of quantitative and qualitative data within a single investigation or ongoing program of inquiry is encouraged by a new research methodology called "mixed methods." This methodology's basic tenet is that combining quantitative and qualitative data collecting and analysis enables a more comprehensive and synergistic use of data than either approach alone. (Wisdom, 2013).

Recently, mixed methods research has expanded into the fields of nursing, family medicine, social work, mental health, pharmacy, allied health, and others in the health and medical sciences. Research using mixed approaches has its origins in the social sciences. Recently, its approaches were enhanced and developed to accommodate a range of study problems (Creswell and Plano Clark, 2011). Some of these procedures include enhancing rigor, offering alternative mixed methods designs, defining a shorthand notation system for describing the designs to improve communication between fields, visualizing procedures through diagrams, noting research questions that can especially profit from integration, and creating justifications for carrying out various types of mixed methods studies.

The core characteristics of a well-designed mixed methods study include the following:

1. collecting, analyzing, and comparing qualitative and quantitative data (closed-ended).
2. Using strict protocols for data collection and analysis that are consistent with the history of each methodology, such as making sure the right sample size is used for both quantitative and qualitative analyses.
3. Including the data in the data analysis or discussion.
4. Using techniques that combine quantitative and qualitative components simultaneously or in a different sequence, using the same sample or distinct samples.
5. Taking into account the techniques used in theoretical research models, including the social constructionist model, which seeks to comprehend various viewpoints on a specific topic.

The term "mixed techniques" refers to obtaining, analyzing, and "mixing" both in order to properly comprehend a research problem and interpret data quantitative and qualitative research and approaches in a single study.

Steps for Conducting Mixed Methods Study

- Determine the purpose of a mixed methods study, the method used to collect the data, the type of design, and whether a mixed methods study is feasible.
- Make inquiries using a combination of qualitative and quantitative methods.
- A one- or two-phase research design should be used to write the report. Gather both quantitative and qualitative data, and then analyze them either independently or together.

The Right Time to Deploy Mixed Methods Designs

• When qualitative and quantitative data combine to make it easier for you to understand your research challenge than either type could do on its own.
• When a single research approach, such as qualitative or quantitative, is insufficient to address the topic at hand or respond to the study's specific research questions.
• Practicality, a variety of opinions, bias, and objectivity are characteristics of pragmatism.
• To supplement a largely quantitative investigation with a qualitative component.
• To advance a probe from one stage to the next.
• Perform qualitative research before developing an instrument.
• To obtain more precise results, follow up a quantitative investigation with a qualitative one.

Mixed Methods Research Methodology

In mixed methods research, both quantitative and qualitative data collection methodologies are utilised, such as:

In addition to interviews and questionnaires, other techniques include

- focus groups,
- document analysis,
- performance tests,
- questionnaires, and
- interviews.

When to Gather Data:

Parallel Data Gathering: When both qualitative and quantitative data are obtained simultaneously, this is what happens. For instance, semi-structured observations of

the service center are conducted concurrently with the distribution of a closed-ended questionnaire to a large number of service consumers.

Sequential Data Gathering: When one type of data is initially acquired and then used to guide the acquisition of another type of data, this occurs. One method for merging qualitative and quantitative data by switching between the two is sequencing. The information that will be gathered to guide the construction of the following set of tools and the overall success of the research depends on the validity of both qualitative and quantitative data collection options as well as the timing of the usage of each type of tool. The assessment design picked will determine the kind of sequential data gathering techniques used. The following list provides justifications for particular timing choices:

- Qualitative data should be gathered before quantitative data.
- Qualitative research can be used to "map out" significant issues and procedures that will be further examined or to generate hypotheses that will be tested with quantitative tools.
- Establishing trust: Participatory activities can help participants and researchers establish a rapport before doing quantitative research.

After gathering quantitative data, qualitative analysis comes next: Using qualitative methods to analyze quantitative outputs: Testing null hypotheses or looking into unexpected results can both be done using qualitative research methodologies. For instance, a preliminary analysis to find groups of related instances, followed by in-depth case analyses of cases that represent the various cases

When to combine data:

- ✓ Component design is the process of separately gathering data from several sources, combining it for analysis, and drawing conclusions. This design is a method for evaluating mixed choices that conducts the qualitative and quantitative portions of the evaluation independently before combining the data to make an educated decision on both at the time the report is written. These elements frequently relate to various data sources, such as quantitative data from a questionnaire with closed-ended questions and qualitative data from participant observation or key informant interviews, or occasionally to various aspects of the overall evaluation, such as qualitative data about context and processes and quantitative data about results and impacts.
- ✓ Integrated design: This is when the researcher mixes many possibilities to carry out the evaluation in order to offer more illuminating insights. This method of evaluating mixed choices incorporates both qualitative and quantitative data into the final design. This can be done iteratively or repeatedly, using the results of some qualitative data to guide the collection of quantitative data and vice versa, or simultaneously, using qualitative and quantitative data to be gathered and analyzed together to be able to understand their areas of convergence and divergence.

Purpose of combining data:

When data are combined, researchers do so for varied reasons, which are determined by the needs of the evaluation endeavour itself. Hence, data may be combined for the purpose of enriching, examining and or explaining them.

- **Enriching**: this presupposes making use of qualitative work to detect concerns or find data on variables not gotten by quantitative surveys. In principle, this instrument can be used in either way, from qualitative to quantitative methods or either way.
- **By examining**: It means generating hypotheses from qualitative endeavours to be tried through the quantitative method. In principle, this mechanism may be useful in either way, from qualitative to quantitative approaches or vice versa.
- **By explaining:** this means using The term "By examining" refers to the process of developing hypotheses from qualitative endeavors that will be tested using the quantitative technique. This method might theoretically be helpful for both qualitative and quantitative research, or vice versa.
- By way of explanation, this refers to the use of qualitative data to comprehend unexpected results from quantitative data. To understand unexpected outcomes from quantitative data, this entails using qualitative data. In theory, this tool can be applied in both qualitative and quantitative research, or vice versa. Qualitative data to understand unexpected outcomes from quantitative data. This means using qualitative data to understand unsuspected consequences from quantitative data. In principle, this tool may be used in either ways, from qualitative to quantitative approaches or vice versa.

Triangulation, confirming, reinforcing or rejecting: this means affirming or refuting findings from quantitative data through the use of qualitative data. It permits data authentication through cross-verification from multiple sources in order to assess the consistency of results obtained using a variety of tools and increase the opportunity for control, or, at least, evaluate some of the pressures or manifold causes prompting outcomes. With this, it is easier for the evaluator to determine whether or not the causal agents and effects are the same, or that an independent event occurs which snaps the chain of causation.

Triangulation, going by Cohen and Manion (2000:254) transcends only validation, to include deepening and broadening researcher's comprehension which can be used to create origination in outlining the models. In addition, this could result in multi-perspective meta-interpretations, because it is an effort to draw or clarify better, the robustness and intricacy of human conduct by reviewing it from different standpoints.

Typologies

While presenting the typologies of triangulation, Denzin (1973:301) proposes four basic types of triangulation:

- ✓ Data triangulation: it requires time, distance, and personnel.

- ✓ Triangulation by an investigator: it needs several investigators in a research endeavour.
- ✓ Triangulating theory: this means the use of more than one theoretical structure in the explanation of the spectacle to give vigorous investigation.
- ✓ Triangulating methodology: this requires the use of different sources to collect data, like interviews, observations, questionnaires, surveys and documents.

Rationale behind Triangulation

As Carvalho and White (1997) put it, four reasons are given for undertaking triangulation:

- ✓ To enrich: by triangulating different aspect of an issue, the results of varying informal and formal instruments give worth to one another.
- ✓ To refute: whenever a researcher explains different aspect of an issue, and finds out, it assists in refuting the hypothesis, especially in situations in which one set of options invalidates a hypothesis produced by another set.
- ✓ To confirm: this is when a set of choices endorses or substantiate a hypothesis generated by another set of options
- ✓ To explain: It is where a set of selections gives information on unanticipated results gotten from another set of selections.

Regarding the use of mixed methods research design, Wisdom J. et al (2013) identified five different uses for which the approach can be put:

- ✓ **Authenticate outcomes using quantitative and qualitative data foundations**: Assessors can make use of a convergent design to liken outcomes from qualitative and quantitative data foundations. It requires gathering both data types at approximately the same time; evaluating facts using analogous constructs for both types; independently scrutinising them; and comparing results through processes like side-by-side assessment in a dialogue, transmuting the qualitative data set into quantitative grooves, or co-operatively showing both data forms. To exemplify, the researcher can collect qualitative data to evaluate the personal involvements of patients while also collecting facts from survey tools calculating the value of care. Both types of information can give approval for one another and also produce a concrete foundation for illustrating inferences about the interposition.
- ✓ **Exploring quantitative results through qualitative data**: This descriptive sequential design normally consists of two phases: a preliminary quantitative instrument phase, followed by a qualitative data collection segment, where the qualitative part directly builds on the results from the measurable phase. In this way, the qualitative data can be used to fully explain the measurable outcomes. For instance, data from tool statistics about costs might be further explored with qualitative focus groups to fully understand how participant

personal experiences compare to the tool results. This research type explains how mixed methods are used to clarify qualitatively how quantitative instruments may function.

- ✓ **Develop survey instruments**: Mixed methods study design could help in the improvement of suitable quantitative instruments that gives correct procedures within a given situation. Exploratory sequential design involves collecting qualitative exploratory data, getting the data analyzed and deploying the results into developing a psychometric instrument that is properly adapted to the study sample. This mechanism is then, in turn, administered to a population sample. For instance, a research could start with a qualitative examination through consultations with primary care givers to measure what concepts should be quantified to much better comprehend advanced quality of care. From this examination, a tool could be established using arduous scale development procedures (DeVellis, 1991) that are then tried with a sample. By this mixed methods approach can be used to develop and test a psychometric instrument that advances on current procedures.
- ✓ **Augment a quantitative outcomes study with qualitative data**: Embedded design refers to a consequence study, such as a randomized, organized trial with qualitative data collection and evaluation added. In a study of this kind, the researcher collects and analyzes both quantitative and qualitative data. At the start of the study, during the intervention, and after the intervention, the qualitative data may be incorporated. This enhances the outcomes study and is a well-known technique in application and distribution research. (Palinkas, Aarons, Horwitz, et al., 2011).
- ✓ **Involvement of community-based participants:** This collaborative strategy is an illustration of a multiphase design. the strategy for orchestrating change that incorporates public participants in multiple quantitative and qualitative stages of the research (Mertens, 2009). During the research process, this design would include patients, important healthcare professionals and staff, and more suppliers and members of the community. Key participants participate as fellow researchers in a plan, contributing their knowledge of their needs, how those needs are met, and how to implement changes.
- ✓ Triangulation reduces bias: Bias is a problem when trying to trust only one solution. In research, there are many different types of bias that can occur, and triangulation can help with the majority of them.
- ✓ Bias that can be seen in measurements is one that results from the collection of the data. However, triangulation enables the combination of single and cluster research methods to assist reduce bias brought on by peer pressure on focus group participants or overstating of results by a participant observer.
- ✓ Bias in Sampling: This type occurs when a study excludes some or all of the population being studied because it is more appropriate to do so (also known

as omission bias) (called inclusion bias). To provide adequate analysis of the sampling, triangulation combines the many advantages of these options.

- ✓ Bias in Procedure: At this point, donors continue to face some pressure to provide information. For instance, including polls while conducting "vox pop" (man on the street reporting or filmed dialogues with street people) type interviews with participants could have caught them off guard and impacted their responses. In situations where respondents have plenty of time to provide thoughtful comments, triangulation enables researchers to combine shorter arrangements with longer ones.

Merits Of Mixed Methods Approach

Any researcher adopting a mixed methods study has numerous gains above those using a single method, as discussed below:

1) It helps in comparing statistical and qualitative information
2) It mirrors participants' perspectives
3) It fosters scholarly interaction
4) It provides methodological flexibility
5) Rich and or comprehensive data is collected

Challenges To Mixed Methods Approach

In Social Science research, there is hardly any method without its limitations as no one single method is all-encompassing or without flaws. Thus, these studies are challenging to apply, especially when using them to evaluate complex interferences such as social inquiry. Below are several challenges any user of the approach will most likely encounter:

a) Increase in the difficulty of appraisals: Studies using mixed designs require careful planning and execution. They necessitate careful design to represent all aspects of research, including scheduling (the order of qualitative and quantitative components), study sample (identical, embedded, or parallel), and goal of data incorporation. For many academics, integrating both data sets during analysis is a particularly motivating stage. (Wisdom, et al., 2013).

b) A multidisciplinary research team is required: Superior blended methods studies require the collaboration of a team of scientists from several scientific disciplines, and for the greatest study, they must be open to approaches that admit the potential that they are outside of their field of competence. In addition to being proficient in presenting defensible reasons, outcome approximating masters can be questioned anywhere the established order has been upset. As each system must adhere to its own rules for rigor, it may be difficult to ensure that each component of a study on many forms has the proper features. (Wisdom, et al., 2013). For instance, a larger sample size is necessary to achieve statistical significance in quantitative analyses, which entails achieving the objectives of fullness (rather than the discovery

of additional information through the use of more interviews) and significance. In situations when there is inadequate numerical effect, rooted samples—in which a qualitative subsample is embedded within a larger quantitative sample—can be helpful.
c) **More fundings are required:** These studies demand more time and resources than a linear study would, as well as more labor.

Application of Mixed Methods to Research
Wesley University Students and the Problem of Mass Failure in a General Course: Analysing What Went Wrong.

The researcher set out to study the rationale behind the widespread failure of the course in two successive academic sessions, especially because the course was not newly introduced, neither was it recently reassigned to another lecturer in the school. To this end, the endeavour adopted a multidisciplinary and or multifaceted methods of data gathering and analysis and specifically adopted parallel triangulation, through which both qualitative and quantitative data were collected at the same time, in order to enrich data gathering. 100 students and lecturers were chosen randomly and asked both open-ended and close-ended questions relating to the main reasons there were massive failures in the course for two sessions simultaneously.

Previously, the lecturer and almost everyone involved at the management level held the view that lack of desire to be creative, attend classes and participate in group assignments were the main reasons for the outcome, but the problem with the conclusion was that there no systematic study of the phenomenon, it was a recurring and chorus-like assertion and ultimately failed to capture other factors that might be spurious, which could have snapped the chain of causation. Respondents were asked, using Lickert Scale, to choose between, Strongly Agree, Agree, Undecided, Disagree and Strongly Disagree, with the series of questions posed to them, especially whether they agreed with the above widely held view. Also, the research gathered some respondents, using focus group, and they were asked to provide their own reasons for the result they and their students got in the course.

Initially, using Pearson correlation coefficient tool to determine the level of correlation between what was said and the outcome of the research, the results from the questionnaire revealed that unseriousness, lecturer's wrong approach to teaching and unwillingness to award marks based on group work as against giving marks based on individual's level of participation in group assignment were the reasons for the failure. However, adopting thematic content analysis to analyse the focus group discussions involving five different departments, it showed that other very fundamental, but unspoken reasons sufficed, which were that the lecturer taught them using foreign grammatical accent, extra-fast and completely alien to the students, and refused to give students materials for the course. In fact, students complained that the

course handler almost fundamentally jettisoned all literature written on the subject; but instead, insisted that they had to use his exact tutorial words during examination, without the option to record his lectures. Some confessed to have recorded his tutorials, but could not understand it even after playing the audio notes severally.

Research Findings

From the foregoing, it is found that, although the most suitable methods deployable to social enquiries should be determined by the subject of study, to be able to come up with a reliable finding in social evaluations, a combination of approaches, both to data gathering and analyses will suffice. This is true because there are clear flaws in both primary and secondary data collection methods as well as quantitative and qualitative data analysis methods. These flaws can only be fixed by consciously combining different methods so that the strengths of each can be used to make up for the weaknesses of the others. Whether triangulation is parallel or sequential, the fact that it takes care of the criticisms levelled against the use of a single method and because it makes whatever outcome of any research more reliable qualify it to be a better alternative choice in social research.

Sequel to the above, the research found that there were many other experiential causes for the failure different from the widely held view and that, most importantly, the decision to mix methods paid off in the long run as it was able to throw up several important results that were not envisaged at the beginning of the research endeavour, revealing and better buttressing the fact that mixed methods approach helps to enrich data collection and analysis.

Conclusion

The thoroughness and conclusions of an evaluation can both be strengthened by using a mixed methods approach that includes both qualitative and quantitative data. Rarely does any evaluation process completely convey the complexity of how packages work in the real world. By carefully choosing the mixed method technique that best satisfies the evaluation's interrogations and fulfills its resource limits, researchers can condense richer, more expressive knowledge about the effectiveness and implementation of models. As a result, there is a growing awareness of approach among assessors as they attempt to creatively integrate multiple assessment frameworks, tools, and procedures. The desire to combine social science investigations with predominantly qualitative and quantitative theoretical approaches sets apart mixed methods techniques.

Recommendation

- ✓ The deliberate employment of diverse methods for specific reasons utilizing specific mixed-method designs is what distinguishes the method from other evaluation practices, even though many evaluators today frequently use a range of techniques. (Greene 2005:255).

- ✓ A careful deployment of this method will improve validity and replicability of findings.

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