

2. RESEARCH PARADIGM: QUANTITATIVE, QUALITATIVE AND MIXED – THEIR CHARACTERISTICS

Structure

2.1 Objectives

2.2 Research Approaches

2.3 Philosophical Assumptions

2.4 Paradigms or Worldviews

2.5 Research Designs and Characteristics

2.6 Summary

2.7 Unit end Questions

2.8 Suggested Reading

2.1 Objectives

After reading this unit you will be able to:-

- Describe the field of research approach
- Identify the philosophical assumptions of educational research approach
- Explain the paradigms or worldviews of educational research
- Define research designs and characteristics

2.2 Research Approaches

Historically, educational researchers used approaches that involved the use of the scientific method. However, over the last three decades, researchers have adopted diverse philosophies toward their research. Now, there are certain philosophical assumptions that underpin an educational researcher's decision to conduct research. These philosophical assumptions address issues related to the nature of reality (ontology), how researchers know what they know (epistemology), and the methods used to study a particular phenomenon (methodology).

Educational researchers have also followed well-defined, widely accepted procedures for stating research topics, carrying out the research process, analyzing the resulting data, and verifying the quality of the study and its conclusions. Often, these research procedures are based on what has come to be known as a quantitative approach to conducting and obtaining educational

understandings. The quantitative framework in educational research involves the application of the scientific method to try to answer questions about education.

Basically educational research focuses on three approaches- (a) Quantitative, (b) Qualitative, and (c) Mixed methods.

Quantitative research is an approach for testing objective theories by examining the relationship among variables. These variables, in turn, can be measured, typically on instruments, so that numbered data can be analyzed using statistical procedures. The final written report has a set structure consisting of introduction, literature and theory, methods, results, and discussion. Like qualitative researchers, those who engage in this form of inquiry have assumptions about testing theories deductively, building in protections against bias, controlling for alternative explanations, and being able to generalize and replicate the findings.

Qualitative research is an approach for exploring and understanding the meaning individuals or groups ascribe to a social or human problem. The process of research involves emerging questions and procedures, data typically collected in the participant's setting, data analysis inductively building from particulars to general themes, and the researcher making interpretations of the meaning of the data. The final written report has a flexible structure. Those who engage in this form of inquiry support a way of looking at research that honors an inductive style, a focus on individual meaning, and the importance of rendering the complexity of a situation.

Mixed methods research is an approach to inquiry involving collecting both quantitative and qualitative data, integrating the two forms of data, and using distinct designs that may involve philosophical assumptions and theoretical frameworks. The core assumption of this form of inquiry is that the combination of qualitative and quantitative approaches provides a more complete understanding of a research problem than either approach alone.

Five philosophical assumptions lead to an individual's choice of educational research: ontology, epistemology, axiology, rhetorical, and methodological assumptions. The qualitative researcher chooses a stance on each of these assumptions, and the choice has practical implications for designing and conducting research. Although the paradigms of research continually evolve, four will be mentioned that represent the beliefs of researchers that they bring to educational research: post-positivism, constructivism, advocacy /participatory and pragmatism. Each represents a different paradigm for making claims about knowledge, and the characteristics of each differ considerably.

2.3 Philosophical Assumptions

In the choice of educational research, inquirers make certain assumptions. These philosophical assumptions consist of a stance toward:-

- The nature of reality (ontology)
- How the researcher knows what she or he knows (epistemology)
- The role of values in the research (axiology)
- The language of research (rhetoric) and
- The methods used in the process (methodology) (Creswell, 2003).

The **ontological** issue relates to the nature of reality and its characteristics. When researchers conduct qualitative research, they are embracing the idea of multiple realities. Different researchers embrace different realities.

The **epistemological** assumption, conducting a study means that researchers try to get as close as possible to the participants being studied. In practice, social science researchers conduct their studies in the "field," where the participants live and work-these are important contexts for understanding what the participants are saying. The longer researchers stay in the "field" or get to know the participants, the more they "know what they know" from firsthand information.

All researchers bring values to a study, but social science researchers like to make explicit those values. This is the **axiological** assumption that characterizes qualitative research. In a qualitative study, the inquirers admit the value-laden nature of the study and actively report their values and biases as well as the value-laden nature of information gathered from the field

There is rhetoric for the discourse of qualitative research that has evolved over time. Qualitative researchers tend to embrace the **rhetorical** assumption that the writing needs to be personal and literary in form. For example, they use metaphors, they refer to themselves using the first-person pronoun, "I," and they tell stories with a beginning, middle, and end, sometimes crafted chronologically, as in narrative research. The language of the social science researcher becomes personal, literary, and based on definitions that evolve during a study rather than being defined by the researcher.

The procedures of qualitative research, or its **methodology**, are characterized as inductive, emerging, and shaped by the researcher's experience in collecting and analyzing the data and in quantitative research, or its methodology, are characterized as deductive. The logic that the qualitative researcher follows is inductive, from the ground up, rather than handed down entirely from a theory or from the perspectives of the inquirer. Sometimes the research questions change in the middle of the study to reflect better the types of questions needed to understand the research problem. In response, 'the data collection strategy, planned before the study, needs to be modified to accompany the new questions. During the data analysis, the researcher follows a path of analyzing the data to develop an increasingly detailed knowledge of the topic being studied.

Assumptions	Questions	Characteristics	Implications for Practice (Examples)
Ontological	What is the nature of reality?	Reality is subjective and multiple, as seen by participants in the study	Researcher uses quotes and themes in words of participants and provides evidence of different perspectives
Epistemological	What is the relationship between the researcher and that being researched?	Researcher attempts to lessen distance between himself or herself and that being researched	Researcher collaborates, spends time in field with participants, and becomes an 'insider'
Axiological	What is the role of values?	Researcher acknowledges that research is value laden and that biases are present	Researcher openly discusses values that shape the narrative and includes his or her own interpretation in conjunction with the interpretations of participants
Rhetorical	What is the language of research?	Researcher writes in a literary, informal style using the personal voice and uses qualitative terms and limited definitions	Researcher uses an engaging style of narrative, may use first-person pronoun, and employs the language of qualitative research
Methodological	What is the process of research?	Researcher uses inductive logic, studies the topic within its context, and uses an emerging design	Researcher works with particulars (details) before generalisations, describes in detail the context of the study, and continually revises questions from experiences in the field

Source: Adapted from Creswell (2007).

2.4 Paradigms or Worldviews

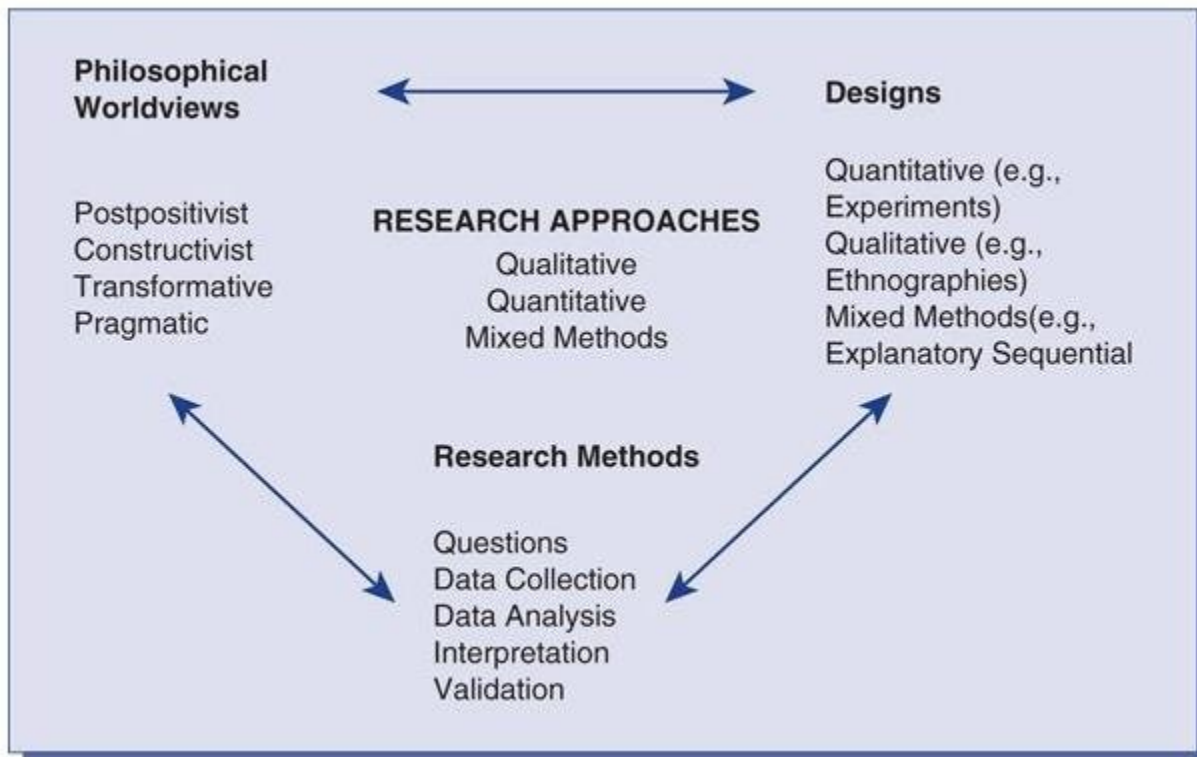
A paradigm or worldview is "a basic set of beliefs that guide action". These beliefs have been called paradigms, philosophical assumptions, epistemologies, and ontologies broadly conceived research methodologies and alternative knowledge claims (Creswell, 2003). Paradigms used by social science researchers vary with the set of beliefs they bring to research, and the types have continually evolved over time.

The approach to research involves philosophical assumptions as well as distinct methods or procedures. The broad research approach is the plan or proposal to conduct research, involves the intersection of philosophy, research designs, and specific methods.

Philosophical Worldviews

Although philosophical ideas remain largely hidden in research (Slife & Williams, 1995), they still influence the practice of research and need to be identified. This information will help to explain why the researcher chose qualitative, quantitative, or mixed methods approaches for conduct research.

A Framework for Research-the Interconnection of Worldviews, Design, and Research Methods



Worldviews are a general philosophical orientation about the world and the nature of research that a researcher brings to a study. Worldviews arise based on discipline orientations, students' advisors/mentors inclinations, and past research experiences. The types of beliefs held by individual researchers based on these factors will often lead to embracing a qualitative, quantitative, or mixed methods approach in their research. There are basically four types of worldviews used in social science research. They are:- postpositivism, constructivism, advocacy/participatory, and pragmatism (Creswell, 2003).

a. The Postpositivist Worldview

The postpositivist assumptions have represented the traditional form of research, and these assumptions hold true more for quantitative research than qualitative research. This worldview is sometimes called the scientific method, or doing science research. It is also called positivist/postpositivist research, empirical science, and postpositivism. This last term is called

post-positivism because it represents the thinking after positivism, challenging the traditional notion of the absolute truth of knowledge and recognizing that we cannot be positive about our claims of knowledge when studying the behavior and actions of humans. The postpositivist tradition comes from 19th-century writers, such as Comte, Mill, Durkheim, Newton, and Locke (Smith, 1983) and more recently from writers such as Phillips and Burbules (2000).

Postpositivists hold a deterministic philosophy in which causes (probably) determine effects or outcomes. Thus, the problems studied by postpositivists reflect the need to identify and assess the causes that influence outcomes, such as found in experiments. It is also reductionistic in that the intent is to reduce the ideas into a small, discrete set to test, such as the variables that comprise hypotheses and research questions. The knowledge that develops through a postpositivist lens is based on careful observation and measurement of the objective reality that exists “out there” in the world. Thus, developing numeric measures of observations and studying the behavior of individuals becomes paramount for a postpositivist. Finally, there are laws or theories that govern the world, and these need to be tested or verified and refined so that we can understand the world. Thus, in the scientific method—the accepted approach to research by postpositivists—a researcher begins with a theory, collects data that either supports or refutes the theory, and then makes necessary revisions and conducts additional tests.

Following are the assumptions given by Phillips and Burbules (2000):-

- Knowledge is conjectural (and antifoundational)—absolute truth can never be found. Thus, evidence established in research is always imperfect and fallible. It is for this reason that researchers state that they do not prove a hypothesis; instead, they indicate a failure to reject the hypothesis.
- Research is the process of making claims and then refining or abandoning some of them for other claims more strongly warranted. Most quantitative research, for example, starts with the test of a theory.
- Data, evidence, and rational considerations shape knowledge. In practice, the researcher collects information on instruments based on measures completed by the participants or by observations recorded by the researcher.
- Research seeks to develop relevant, true statements, ones that can serve to explain the situation of concern or that describe the causal relationships of interest. In quantitative studies, researchers advance the relationship among variables and pose this in terms of questions or hypotheses.
- Being objective is an essential aspect of competent inquiry; researchers must examine methods and conclusions for bias. For example, standard of validity and reliability are important in quantitative research.

b. The Constructivist Worldview

Constructivism or social constructivism (often combined with interpretivism) is such a perspective, and it is typically seen as an approach to qualitative research. The ideas came from Mannheim and from works such as Berger and Luekmann's (1967) *The Social Construction of Reality* and Lincoln and Guba's (1985) *Naturalistic Inquiry*. others.

Social constructivists believe that individuals seek understanding of the world in which they live and work. Individuals develop subjective meanings of their experiences— meanings directed toward certain objects or things. These meanings are varied and multiple, leading the researcher to look for the complexity of views rather than narrowing meanings into a few categories or ideas. The goal of the research is to rely as much as possible on the participants' views of the situation being studied. The questions become broad and general so that the participants can construct the meaning of a situation, typically forged in discussions or interactions with other persons. The more open-ended the questioning, the better, as the researcher listens carefully to what people say or do in their life settings. Often these subjective meanings are negotiated socially and historically. They are not simply imprinted on individuals but are formed through interaction with others (hence social constructivism) and through historical and cultural norms that operate in individuals' lives. Thus, constructivist researchers often address the processes of interaction among individuals. They also focus on the specific contexts in which people live and work in order to understand the historical and cultural settings of the participants. Researchers recognize that their own backgrounds shape their interpretation, and they position themselves in the research to acknowledge how their interpretation flows from their personal, cultural, and historical experiences. The researcher's intent is to make sense of (or interpret) the meanings others have about the world. Rather than starting with a theory (as in postpositivism), inquirers generate or inductively develop a theory or pattern of meaning.

Crotty (1998) identified several assumptions:

- Human beings construct meanings as they engage with the world they are interpreting. Qualitative researchers tend to use open-ended questions so that the participants can share their views.
- Humans engage with their world and make sense of it based on their historical and social perspectives—we are all born into a world of meaning bestowed upon us by our culture. Thus, qualitative researchers seek to understand the context or setting of the participants through visiting this context and gathering information personally. They also interpret what they find, an interpretation shaped by the researcher's own experiences and background.
- The basic generation of meaning is always social, arising in and out of interaction with a human community. The process of qualitative research is largely inductive; the inquirer generates meaning from the data collected in the field.

c. The Advocacy/Participatory/Transformative Worldview

Another group of researchers holds to the philosophical assumptions of the transformative approach. This position arose during the 1980s and 1990s from individuals who felt that the postpositivist assumptions imposed structural laws and theories that did not fit marginalized individuals in our society or issues of power and social justice, discrimination, and oppression that needed to be addressed. There is no uniform body of literature characterizing this worldview, but it includes groups of researchers that are critical theorists; participatory action researchers; Marxists; feminists; racial and ethnic minorities; persons with disabilities; indigenous and postcolonial peoples; and members of the lesbian, gay, bisexual, transsexual, and queer communities. Historically, the transformative writers have drawn on the works of Marx, Adorno, Marcuse, Habermas, and Freire etc.

These inquirers felt that the constructivist stance did not go far enough in advocating for an action agenda to help marginalized peoples. A transformative worldview holds that research inquiry needs to be intertwined with politics and a political change agenda to confront social oppression at whatever levels it occurs. Thus, the research contains an action agenda for reform that may change lives of the participants, the institutions in which individuals work or live, and the researcher's life. Moreover, specific issues need to be addressed that speak to important social issues of the day, issues such as empowerment, inequality, oppression, domination, suppression, and alienation. The researcher often begins with one of these issues as the focal point of the study. This research also assumes that the inquirer will proceed collaboratively so as to not further marginalize the participants as a result of the inquiry. In this sense, the participants may help design questions, collect data, analyze information, or reap the rewards of the research. Transformative research provides a voice for these participants, raising their consciousness or advancing an agenda for change to improve their lives. It becomes a united voice for reform and change. This philosophical worldview focuses on the needs of groups and individuals in our society that may be marginalized or disenfranchised. Therefore, theoretical perspectives may be integrated with the philosophical assumptions that construct a picture of the issues being examined, the people to be studied, and the changes that are needed, such as feminist perspectives, racialized discourses, critical theory, queer theory, disability theory etc.

key features of the transformative worldview or paradigm by Mertens (2010):-

It places central importance on the study of lives and experiences of diverse groups that have traditionally been marginalized. Of special interest for these diverse groups is how their lives have been constrained by oppressors and the strategies that they use to resist, challenge, and subvert these constraints.

- In studying these diverse groups, the research focuses on inequities based on gender, race, ethnicity, disability, sexual orientation, and socioeconomic class that result in asymmetric power relationships.

- The research in the transformative worldview links political and social action to these inequities.
- Transformative research uses a program theory of beliefs about how a program works and why the problems of oppression, domination, and power relationships exist.

d. The Pragmatic Worldview

Another position about worldviews comes from the pragmatists. Pragmatism derives from the work of Peirce, James, Mead, and Dewey (Cherryholmes, 1992). Other writers include Murphy (1990), Patton (1990), and Rorty (1990). There are many forms of this philosophy, but for many, pragmatism as a worldview arises out of actions, situations, and consequences rather than antecedent conditions (as in postpositivism). There is a concern with applications—what works—and solutions to problems (Patton, 1990). Instead of focusing on methods, researchers emphasize the research problem and use all approaches available to understand the problem (see Rossman & Wilson, 1985). As a philosophical underpinning for mixed methods studies, Morgan (2007), Patton (1990), and Tashakkori and Teddlie (2010) convey its importance for focusing attention on the research problem in social science research and then using pluralistic approaches to derive knowledge about the problem.

Using Cherryholmes (1992), Morgan (2007), and Creswell (2014), pragmatism provides a philosophical basis for research:

- Pragmatism is not committed to any one system of philosophy and reality. This applies to mixed methods research in that inquirers draw liberally from both quantitative and qualitative assumptions when they engage in their research.
- Individual researchers have a freedom of choice. In this way, researchers are free to choose the methods, techniques, and procedures of research that best meet their needs and purposes.
- Pragmatists do not see the world as an absolute unity. In a similar way, mixed methods researchers look to many approaches for collecting and analyzing data rather than subscribing to only one way (e.g., quantitative or qualitative).
- Truth is what works at the time. It is not based in a duality between reality independent of the mind or within the mind. Thus, in mixed methods research, investigators use both quantitative and qualitative data because they work to provide the best understanding of a research problem.
- The pragmatist researchers look to the what and how to research based on the intended consequences—where they want to go with it. Mixed methods researchers need to establish a purpose for their mixing, a rationale for the reasons why quantitative and qualitative data need to be mixed in the first place.

- Pragmatists agree that research always occurs in social, historical, political, and other contexts. In this way, mixed methods studies may include a postmodern turn, a theoretical lens that is reflective of social justice and political aims.
- Pragmatists have believed in an external world independent of the mind as well as that lodged in the mind.
- Thus, for the mixed methods researcher, pragmatism opens the door to multiple methods, different worldviews, and different assumptions, as well as different forms of data collection and analysis.

Table 1.1 Four Worldviews

Postpositivism	Constructivism
<ul style="list-style-type: none"> • Determination • Reductionism • Empirical observation and measurement • Theory verification 	<ul style="list-style-type: none"> • Understanding • Multiple participant meanings • Social and historical construction • Theory generation
Transformative	Pragmatism
<ul style="list-style-type: none"> • Political • Power and justice oriented • Collaborative • Change-oriented 	<ul style="list-style-type: none"> • Consequences of actions • Problem-centered • Pluralistic • Real-world practice oriented

2.5 Research Approaches as worldviews, Design, methods and characteristics

The researcher not only selects a qualitative, quantitative, or mixed methods study to conduct; the inquirer also decides on a type of study within these three choices. Research designs are types of inquiry within qualitative, quantitative, and mixed methods approaches that provide specific direction for procedures in a research design. Others have called them strategies of inquiry (Denzin & Lincoln, 2011). The worldviews, the designs, and the methods all contribute to a research approach that tends to be quantitative, qualitative, or mixed.

a. Quantitative Design

During the late 19th and throughout the 20th century, strategies of inquiry associated with quantitative research were those that invoked the postpositivist worldview and that originated mainly in psychology. These include true experiments and the less rigorous experiments called quasiexperiments. An additional experimental design is applied behavioral analysis or single-

subject experiments in which an experimental treatment is administered over time to a single individual or a small number of individuals. Non experimental quantitative research such as causal-comparative research design, cor-relational research design, survey research design are used in quantitative research design.

Characteristics:-

Postpositivist worldview, experimental design, and pretest and posttest measures of attitudes In this scenario, the researcher tests a theory by specifying narrow hypotheses and the collection of data to support or refute the hypotheses. An experimental design is used in which attitudes are assessed both before and after an experimental treatment. The data are collected on an instrument that measures attitudes, and the information is analyzed using statistical procedures and hypothesis testing.

 QuestionPro



b. Qualitative Design

In qualitative research, the numbers and types of approaches have also become more clearly visible during the 1990s and into the 21st century. The historic origin for qualitative research comes from anthropology, sociology, the humanities, and evaluation. The various types and complete procedures are now available on specific qualitative inquiry approaches such as:- narrative research, phenomenological research, grounded theory, ethnography research, case study research, discourse analysis, historical research etc.

Characteristics:-

Both Constructivist and Transformative worldview, ethnographic design, and observation of behavior in this situation, the researcher seeks to establish the meaning of a phenomenon from the views of participants. This means identifying a culture-sharing group and studying how it develops shared patterns of behavior over time (i.e., ethnography). One of the key elements of collecting data in this way is to observe participants' behaviors during their engagement in activities, narrative design, and open-ended interviewing for this study; the inquirer seeks to examine an issue related to oppression of individuals. To study this, stories are collected of individual oppression using a narrative approach. Individuals are interviewed at some length to determine how they have personally experienced oppression.



c. Mixed Method Design

Mixed methods involve combining or integration of qualitative and quantitative research and data in a research study. The field of mixed methods research is relatively new with major work

in developing it stemming from the middle to late 1980s. Early thoughts about the value of multiple methods—called mixed methods—resided in the idea that all methods had bias and weaknesses, and the collection of both quantitative and qualitative data neutralized the weaknesses of each form of data. Triangulating data sources—a means for seeking convergence across qualitative and quantitative methods—was born. By the early 1990s, mixed methods turned toward the systematic convergence of quantitative and qualitative databases, and the idea of integration in different types of research designs emerged, they are:- Convergent parallel mixed method, Explanatory sequential mixed method, Exploratory sequential mixed method, Transformative mixed method, Embedded mixed methods design, Multiphase mixed methods design etc.

Characteristics:-

Pragmatic worldview, collection of both quantitative and qualitative data sequentially in the design The researcher bases the inquiry on the assumption that collecting diverse types of data best provides a more complete understanding of a research problem than either quantitative or qualitative data alone. The study begins with a broad survey in order to generalize results to a population and then, in a second phase, focuses on qualitative, open-ended interviews to collect detailed views from participants to help explain the initial quantitative survey.

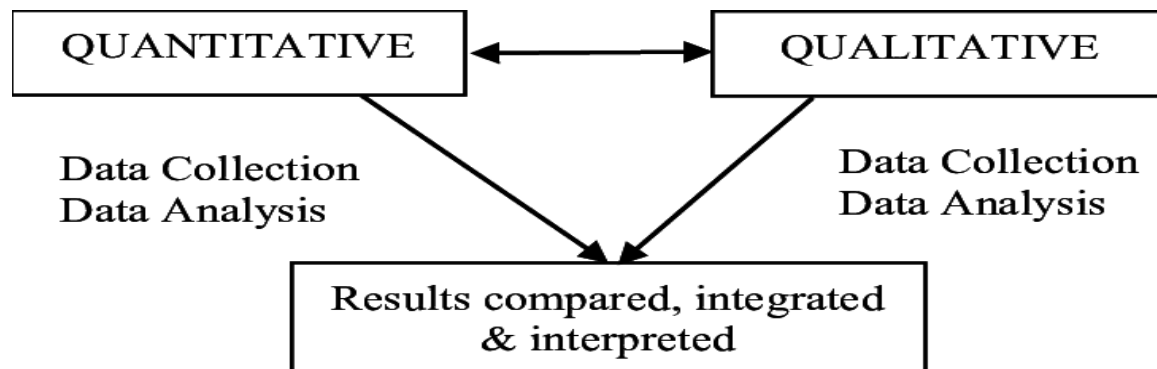


Table 1.3 Quantitative, Mixed, and Qualitative Methods

Quantitative Methods	Mixed Methods	Qualitative Methods
Pre-determined	Both predetermined and emerging methods	Emerging methods
Instrument based questions	Both open- and closed-ended questions	Open-ended questions
Performance data, attitude data, observational data, and census data	Multiple forms of data drawing on all possibilities	Interview data, observation data, document data, and audiovisual data
Statistical analysis	Statistical and text analysis	Text and image analysis
Statistical interpretation	Across databases interpretation	Themes, patterns interpretation

Difference between Quantitative and Qualitative Research

QUANTITATIVE RESEARCH VERSUS QUALITATIVE RESEARCH

Quantitative Research
uses statistics

Data can be measured
accurately

Considered to be
objective

Uncovers measurable
data to formulate
theories and facts and
uncover patterns

Mainly uses
hypotheses

Data collection methods
are highly structured

The sample population
is large

Qualitative Research
uses descriptions and
observations

Data can be observed
and not measured

Considered to
subjective

Helps to understand
the underlying
reasons, opinions, and
motivations

Uses either
hypotheses or
research questions

Data collection methods
are semi-structured or
unstructured

The sample population
is small

Suggested Reading

Ary, D., Jacobs, L. C., Sorensen, C., and Razavieh, A. (2010), Introduction to Research in Education, Wadsworth Cengage Learning, Canada.

Best, J. W. and Kahn, J. V. (1995), Research in Education, Prentice Hall, New Delhi.

Cohen, L., Manison, L., and Morrison, K. (2018), Research Methods in Education, Routledge, London and New York.

Creswell, J. W. (2012), Educational Research Planning, Conducting, and Evaluating Quantitative and Qualitative Research, Pearson, New York.

Gay, L. R., Mills, G.E., and Airasian, P. W. (2012), Educational Research Competencies for Analysis and Application, Pearson, New York.

Kerlinger, Fred. N. (1978), Foundations of Behavioral Research, New York University.

Kothari, R.C. (2004), Research Methodology, New Delhi, New Age International (P) Limited, Publishers.

Langenbach, M., Vaughn, C., and Aagaard, L. (1993), An Introduction to Educational Research, Allyn and Bacon, Boston.