12-03-2022

8th March

1. What is Scientific Knowledge? What features seem specific for it?
2. What is a scientific method? Why do we need it?
3. What features should scientific results have to fit a notion of a method-based study?
4. What is methodology? What meaning does English word ‘methodology’ have?
5. What levels of methodological thought can you name?
6. Are all possible methodological approaches just the same?
7. What is a scientific approach? Is it just a system of belief? Is it a sort of a model?
8. What is Meta-Language? Why do we need it?
9. Are all methods equivalent in Research?
10. What are key stages of scientific research?
11. What is the difference between theory analytical review and empirical research?
12. What is the difference between qualitative and quantitative methods in English Research tradition?
13. Can you name various qualitative and quantitative methods in English Research tradition?
14. What role should an observer play in the research? Should one stay visible or invisible?
15. Can observer influence research results?
16. Can you tell the difference between linguistic scientific research methods and general research methods?

WHAT IS RESEARCH ?

- Research is "creative and systematic work undertaken to increase the stock of knowledge, including knowledge of humans, culture and society, and the use of this stock of knowledge to devise new applications."

WHAT IS RESEARCH ?

- Research [rɪ'sɜːtʃ]

is a systematic investigation to establish facts or principles (or to collect information on a subject).

WHAT IS RESEARCH ?

- Research [rɪˈsɜːtʃ]
- To research – исследовать.

- to carry out investigations into (a subject, problem, etc.)

- Syn: investigate , study , enquire into , look into , probe , explore , analyse , examine , scrutinize etc.

Criteria for Research Problems

- Good research problems must meet three criteria (Kerlinger, 1973):

  1) First, the research problem should describe the relationship between two or more variables.

  2) Second, the research problem should take the form of a question.

  3) Third, the research problem must be capable of being tested empirically (i.e., with data derived from direct observation and experimentation).

CHARACTERISTICS OF SCIENTIFIC METHOD

Most agree that it is characterized by the following elements:

1. Empirical approach
2. Observations
3. Questions
4. Hypotheses
5. Experiments
6. Analyses
7. Conclusions
8. Replication

IMRAD Стандартная структура научной статьи	
Title (Название статьи)	Указывается тема исследования, автор, аффилиация. В студенческих сборниках также научный руководитель.
Annotation (Аннотация)	Конкретизирует содержание статьи и кратко отражает структуру IMRAD
Key Words (Ключевые слова)	Указываются ключевые термины и понятия исследования
Introduction (Введение)	Проблема, актуальность, новизна, объект и предмет; цели и задачи; Аналитический обзор литературы; ключевые понятия исследования.
Methods (Методы)	Методы, материал анализа, условия эксперимента, методики и средства проведения исследования
Results (Результаты)	Анализ, интерпретация и первичное обобщение полученных в результате исследования новых данных.
Discussion (Обсуждение)	Полученные ответы, их достоверность, значение,
Conclusion (Заключение)	Обобщение полученных результатов и выводов по ним; перспективы дальнейших исследований.
References (Литература)	Библиографические данные статей оформляются по требованиям издания (e.g. ГОСТ). Указываются все процитированные и проанализированные источники.

IMRAD 28-02-2028 (learningapps.org)

Scientific research manuscript structure (learningapps.org)

Работа с источниками	
Контрольное количество проанализированных источников не соответствует установленному количеству по плану.	0 баллов
Контрольное количество проанализированных источников соответствует установленному количеству по плану.	1 балл
Обозначенные точки зрения на вопрос не подтверждаются ссылками на источники.	0 баллов
Обозначенные точки зрения на вопрос подтверждаются ссылками на источники.	1 балл
Ссылки на источники не приводятся.	0 баллов
Приводятся ссылки на источники.	1 балл
Приводятся постраничные ссылки на источники.	2 балла
Анализ источников не осуществляется.	0 баллов
Анализ источников осуществляется по авторам.	1 балл
Анализ источников осуществляется по концепциям.	2 балла
Невозможно судить о концепции, лежащей в основе исследования.	0 баллов
Автор принимает устоявшуюся концепцию (или одну из многих) за основу своего исследования.	1 балл
Автор уточняет (и в чем-то дорабатывает) устоявшуюся концепцию (или одну из многих) как основу своего исследования.	2 балла
Автор выступает с принципиально новой концепцией, ложащейся в основу исследования.	4 балла
Возможная оценка:	от 0 до 10 баллов

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RESEARCH

METHODS

OBSERV
ATION

EXPERI
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SURVEY

CASE
STUDY

MODEL
LING

TRIANGU
LATION

RESEARCH

METHODS

QUALITATIVE

QUANTI
TATIVE

QUALITATIVE
QUANTI
TATIVE
RESEARCH
METHODS

RESEARCH
METHODS
QUANTI
TATIVE

RESEARCH
METHODS
MIXED

MIXED

Classification of Types of Research

Research

exploratory [ɪk'splɔrət(ə)rɪ], [ek-], [-splɔː-]
explanatory [ɪk'splænət(ə)rɪ], [ek-]
descriptive [dɪ'skrɪptɪv]
Qualitative ['kwɔlɪtətɪv]
Quantitative ['kwɔntɪtətɪv]; [ˈkwɒntɪˌtətɪv, -ˌteɪtɪv]
experiment [ɪk'sperɪmənt],
quasi ['kweɪzaɪ], ['kwɑːzɪ]

METHODS

Type of scientific procedure	Example of the kind of scientific procedure
Empiric	Observation, measuring, experiment
Theoretical	Inductive, deductive
“Other”	e.g. heuristic

	Description	Example
THEORETICAL	• uses purely theoretical methods (analysis, synthesis, induction, deduction, modeling) • usually does not work with specific data • specific phenomena are viewed from a theoretical point of view	Pedagogical behavior of a teacher is clarified through models or constructions... It can be described verbally or with a scheme... It is treated only theoretically regardless of specific agents...
EMPIRIC	• always works with specific data • reaches specific pieces of knowledge via exact methods • its subjects are animate subjects (teachers, students) or inanimate objects (textbooks, essays written by students)	A novice teacher (Šimoník, 1994). Specific teachers, specific methods (questionnaire), arrives at specific results.

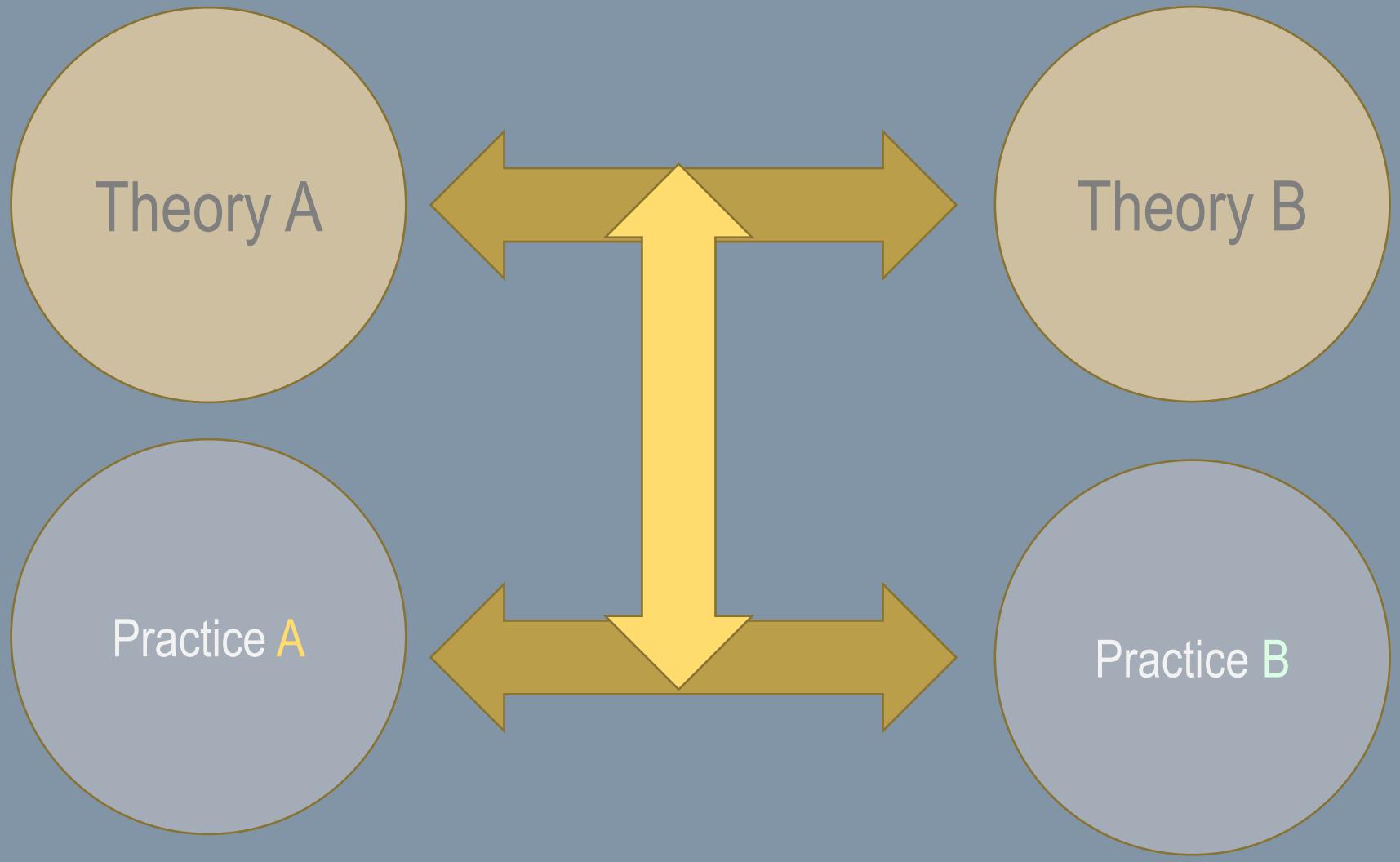
Differentiation of general scientific methods relative to explanation and interpretation

Types of methods	Kinds of methods	Example of individual kinds of methods
Explanation	Empiric	Observation
		Measuring
		Experiment
	General-theoretical	Analysis
		Synthesis
		Induction
		Deduction
		Analogy
		Comparing
		Specific
Interpretation	Narrative	Narration
	Hermeneutic	Understanding a text

Features of A Good Problem Statement

1. It should be clear and precise.
2. It should be able to identify the problem, examine the problem, its key fact and perimeter to be studied.
3. It deals with the gap in information.
4. The statement of problem should be short and snappy
5. It should be adequately important to add to the available body of the work.
6. It should lead to further research.
7. The problem statement should be for the audience.
8. The problem should submit itself for inquiry during the data collection.
9. It should be importance to the researcher and go well with his/her skills, time, and resources
10. The advance towards resolving the problem should be fair.
11. The writing style should be dignified.
12. Your terminologies should be well explained.
13. The range of the problem statement should be kept under control.
14. The problem statement should be compelling and researchable.
15. It should be able to address the five Ws (who, when, why, where, and what)

Research Problem highlights a contradiction



Classification of Types of Research

There are various types of research that are classified according to their objective, depth of study, analysed data, time required to study the phenomenon and other factors.

It's important to note that a research project will not be limited to one type of research, but will likely use several.

Classification of Types of Research

Theoretical

Applied

Classification of Types of Research

Theoretical

Classification of Types of Research

Theoretical

Theoretical research, also referred to as pure or basic research, focuses on generating knowledge, regardless of its practical application. Here, data collection is used to generate new general concepts for a better understanding of a particular field or to answer a theoretical research question.
Results of this kind are usually oriented towards the formulation of theories and are usually based on documentary analysis, the development of mathematical formulas and the reflection of high-level researchers.

Classification of Types of Research

Theoretical

For example, a philosophical dissertation, since the aim is to generate new approaches from existing data without considering how its findings can be applied or implemented in practice.

Classification of Types of Research

Theoretical

Basic research

Basic research is the research to find the basic knowledge or to refine the basic knowledge. Basic research is also called pure research and fundamental research.

For example, an airplane is already flying but now today we want to research how airplane can fly.

Classification of Types of Research

Applied

Here, the goal is to find strategies that can be used to address a specific research problem. Applied research draws on theory to generate practical scientific knowledge, and its use is very common in STEM fields such as engineering, computer science and medicine.

Classification of Types of Research

Applied

This type of research is subdivided into two types:

1. Technological applied research: looks towards improving efficiency in a particular productive sector through the improvement of processes or machinery related to said productive processes.

Classification of Types of Research

Applied

This type of research is subdivided into two types:

2. Scientific applied research: has predictive purposes. Through this type of research design, we can measure certain variables to predict behaviours useful to the goods and services sector, such as consumption patterns and viability of commercial projects.

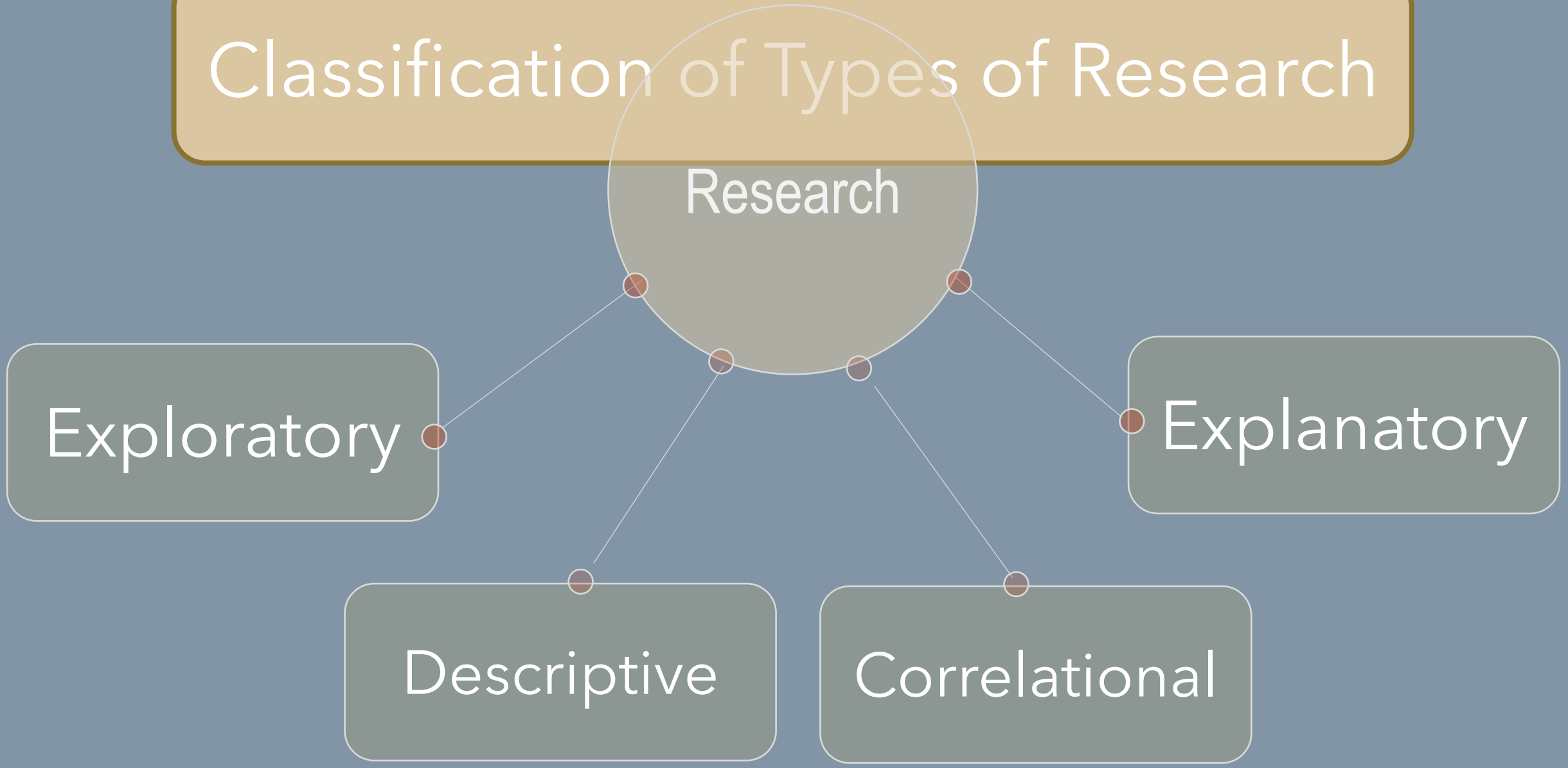
Classification of Types of Research

Applied

Note: In fact, it is common for research projects to first establish the theoretical framework both to define the field of study and to identify possible theories that could be tested or applied to solve the specific problem posed in the project.

Classification of Types of Research

Classification of Types of Research



Classification of Types of Research

Research

Exploratory

Exploratory
Space
explorers

NEWS
00:02:39:04
angel / flight record / remote 2

Exploratory

Exploratory

«Задач и вопросов было хоть отбавляй. Какова поверхность Луны? Вдруг космический аппарат утонет в тоннах пыли? Вдруг под тонкой поверхностью окажутся пустоты? Как управлять аппаратом с Земли? Успехи в проектировании сменялись поражениями, которых было много: три первых запуска аппаратов серии Е-1 закончились аварией ракеты-носителя. Во время четвёртого запуска в январе 1959 года удалось вывести в космос "Луну-1", но станция прошла мимо Луны: инженеры не учли время прохождения командного сигнала с Земли до Е-1 и обратно.»

Exploratory

"Луна-1" сделала несколько открытий: зарегистрировала наличие у Земли радиационного пояса, обнаружила отсутствие магнитного поля у Луны, нашла в космосе ионизированный газ и сумела измерить параметры "солнечного ветра". Американцы, узнав об этом, заявили, что Советы лгут, но вскоре лаборатория реактивного движения в Калифорнии приняла сигнал от "Луны-1" – и скептикам пришлось умыться.

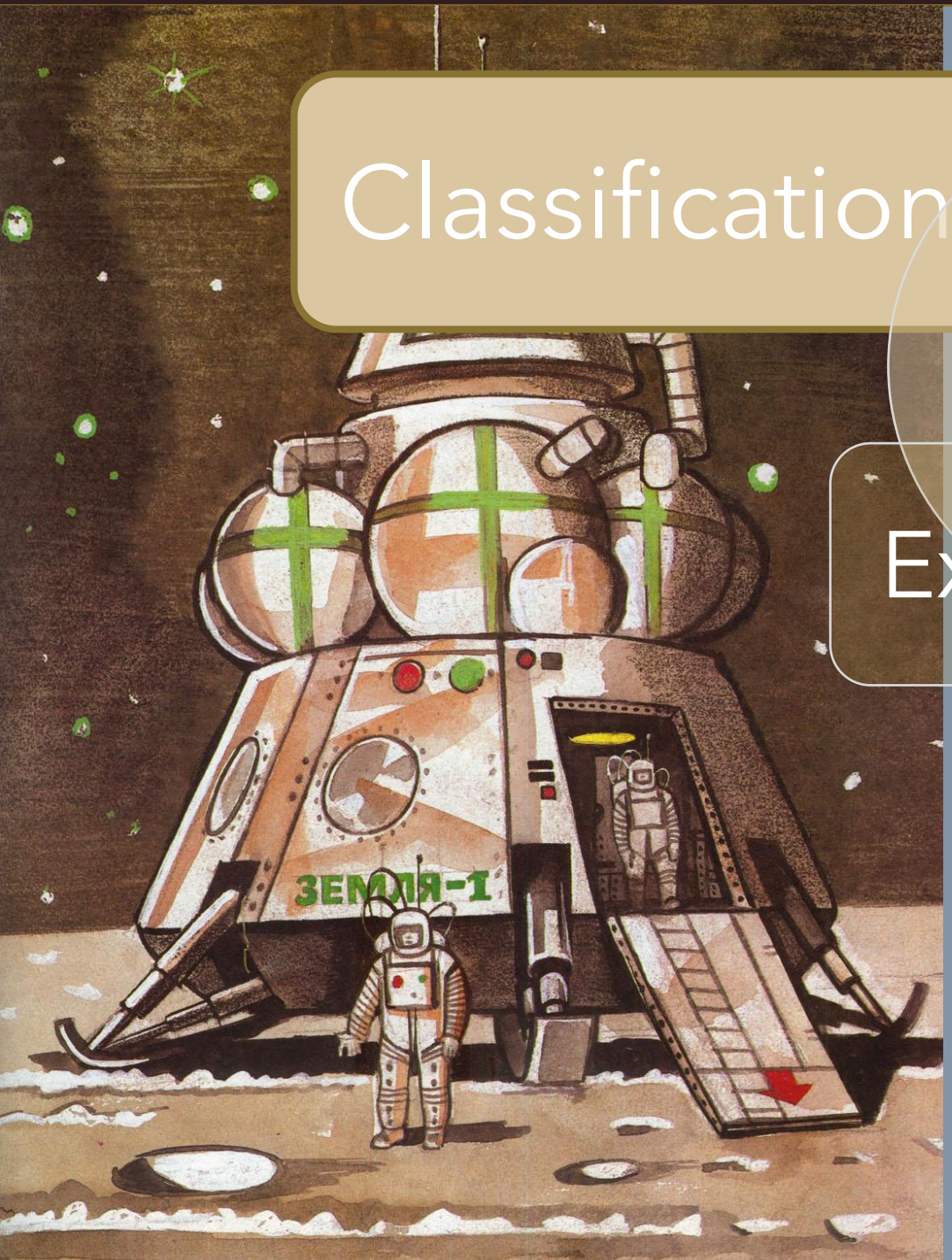
Exploratory

Следующие два запуска окончились авариями. 12 сентября 1959 года СССР запустил к Луне аппарат "Луна-2", который через двое суток врезался в поверхность спутника Земли на скорости 3,3 км/сек. Облако лунной пыли можно было видеть во все телескопы мира. Так в СССР выяснили, что поверхность луны твёрдая, и "пометили" территорию, доставив на спутник "вымпелы" – металлические шары из пластин с гравировкой (название страны, герб и пятиконечная звезда).

Exploratory

США были раздавлены. Запуск "Луны-1" и "Луны-2" доказывал, что у Хрущёва есть баллистические ракеты, способные долететь до Вашингтона, и что Америка проигрывает. А СССР, словно в издёвку, уже 10 октября запустил станцию "Луна-3", которая первой в мире выполнила гравитационный манёвр вокруг спутника и отсняла его обратную сторону двумя камерами, отправив на Землю 17 фотографий. Советы, как первооткрыватели, получили право именовать открытые объекты, и тут же на Луне появились море Мечты и море Москвы, кратеры Менделеев, Складовская-Кюри, Джордано Бруно и другие.

Classification of Types of Research



Research

Exploratory

Classification of Types of Research

Research

Exploratory

Exploratory research is used for the preliminary investigation of a subject that is not yet well understood or sufficiently researched. It serves to establish a frame of reference and a hypothesis from which an in-depth study can be developed that will enable conclusive results to be generated.

Classification of Types of Research

Research

Exploratory

Exploratory research is used for the preliminary investigation of a subject that is not yet well understood or sufficiently researched. It serves to establish a frame of reference and a hypothesis from which an in-depth study can be developed that will enable conclusive results to be generated.

Classification of Types of Research

Research

Exploratory

Because exploratory research is based on the study of little-studied phenomena, it relies less on theory and more on the collection of data to identify patterns that explain these phenomena.
For example, an investigation of the role social media in the perception of self-image.

Classification of Types of Research

Research

Descriptive

The primary objective of descriptive research is to define the characteristics of a particular phenomenon without necessarily investigating the causes that produce it.

Classification of Types of Research

Research

Descriptive

In this type of research, the researcher must take particular care not to intervene in the observed object or phenomenon, as its behaviour may change if an external factor is involved.
For example, investigating how the public census of influential government officials differs between urban and non-urban areas.

Classification of Types of Research

Research

Correlational

The purpose of this type of scientific research is to identify the relationship between two or more variables. A correlational study aims to determine whether a variable changes, how much the other elements of the observed system change.

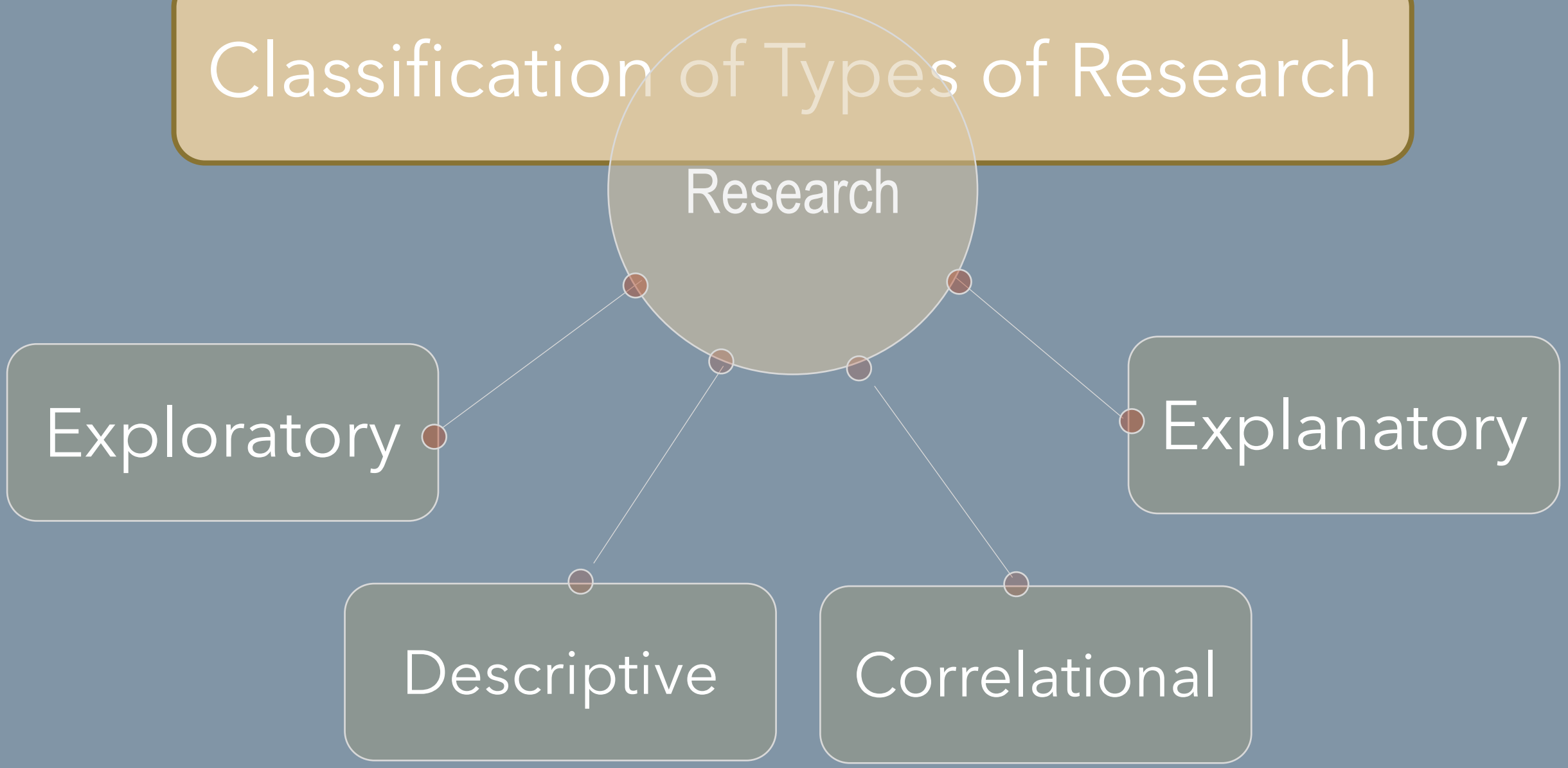
Classification of Types of Research

Research

Explanatory

Explanatory research is the most common type of research method and is responsible for establishing cause-and-effect relationships that allow generalisations to be extended to similar realities. It is closely related to descriptive research, although it provides additional information about the observed object and its interactions with the environment.

Classification of Types of Research



Научными методами эмпирического исследования являются:

наблюдения → целенаправленное восприятие явлений объективной действительности

описания → фиксация средствами естественного или искусственного языка сведений об объекте

измерения → сравнение объекта по каким-либо сходным свойствам или сторонам

эксперименты → наблюдение в специально создаваемых и контролируемых условиях, что позволяет восстановить ход явления при повторении условий

Comparing Research Methods

Table 2.3, p. 36

Comparing Research Methods

Research Method	Basic Purpose	How Conducted	What Is Manipulated	Strengths	Weaknesses
Descriptive	To observe and record behavior	Case studies, surveys, or naturalistic observations	Nothing	Case studies require only one participant; surveys may be done fairly quickly and inexpensively (compared to experiments); naturalistic observations may be done when it is not ethical to manipulate variables.	No control of variables; single cases may be misleading
Correlational	To detect naturally occurring relationships; to assess how well one variable predicts another	Compute statistical association, sometimes among survey responses	Nothing	Works with large groups of data, and may be used in situations where an experiment would not be ethical or possible	Does not specify cause and effect
Experimental	To explore cause and effect	Manipulate one or more factors; use random assignment	The independent variable(s)	Specifies cause and effect, and variables are controlled	Sometimes not feasible; results may not generalize to other contexts; not ethical to manipulate certain variables

	Phenomena	Issues	Methods
Structure	typography, orthography, morphology, syntax, discourse schemata	genre characteristics, orality, efficiency, expressivity, complexity	Structural/Descriptive Linguistics, Text Analysis
Meaning	meaning of words, utterances (speech acts), macrosegments	what the speaker intends, what is accomplished through language	Semantics, Pragmatics
Interaction	turns, sequences, exchanges, threads	interactivity, timing, coherence, interaction as co-constructed, topic development	Conversation Analysis, Ethnomethodology
Social Behavior	linguistic expressions of status, conflict, negotiation, face-management, play; discourse styles, etc.	social dynamics, power, influence, identity	Interactional Sociolinguistics, Critical Discourse Analysis

Fundamental Research	Applied Research
1. Tries to eliminate the theory by adding to the basics of a discipline 2. Problems are analysed from the point of one discipline 3. Generalisations are preferred; 4. Forecasting approach is implemented 5. Assumes that other variables do not change 6. Reports are compiled in a language of technical language of discipline	1 Aims to solve a problem by adding to the field of application of a discipline 2 Often several disciplines work together for solving the problem 3 Often researches individual cases without the aim to generalise 4 Aims to say how things can be hanged 5 Acknowledges that other variables are constant by changing 6 Reports are compiled in a common language

	Exploratory research	**Conclusive research**
Structure	Loosely structured in desing	Well structured and systematic in design
Methodology	Are flexible and investigative in methodology	Have a formal and definitive methodology that needs to be followed and tested
Hypotheses	Do not involve testing of hypotheses	Most conclusive researches are carried out to test the formulated hypotheses
Findings	Findings might be topic specific and might not have much relevance outside of researcher's domain	Findings are significant as they have a theoretical or applied implication

OBSERVATION

Process type	Example (Process + participants underlined; **Process** in Bold; *circumstances* in italics)
material	the negotiations go on forever
behavioural	everybody laughed
mental	you have to understand what he is trying to say to us
verbal	in this region we usually say that it takes a longer time to sell a project than it takes to build it
relational	the total contract figures is split up in a few different companies
existential	there is quite a large group of ethnic Chinese in Singapore

Classification of Types of Research according to the Type of Data Used

Classification of Types of Research according to the Type of Data Used

Qualitative

Quantitative

Classification of Types of Research according to the Type of Data Used

Qualitative

Classification of Types of Research according to the Type of Data Used

Qualitative

Qualitative methods are often used in the social sciences to collect, compare and interpret information, has a linguistic-semiotic basis and is used in techniques such as discourse analysis, interviews, surveys, records and participant observations.

Classification of Types of Research according to the Type of Data Used

Qualitative

In order to use statistical methods to validate their results, the observations collected must be evaluated numerically. Qualitative research, however, tends to be subjective, since not all data can be fully controlled. Therefore, this type of research design is better suited to extracting meaning from an event or phenomenon (the 'why') than its cause (the 'how').

Classification of Types of Research according to the Type of Data Used

Qualitative

For example, examining the effects of sleep deprivation on mood.

Classification of Types of Research according to the Type of Data Used

Quantitative

Classification of Types of Research according to the Type of Data Used

Quantitative

Quantitative research study delves into a phenomena through quantitative data collection and using mathematical, statistical and computer-aided tools to measure them. This allows generalised conclusions to be projected over time.

Classification of Types of Research according to the Type of Data Used

Quantitative

For example, conducting a computer simulation on vehicle strike impacts to collect quantitative data.

Classification of Types of Research according to the Type of Data Used

Qualitative

Quantitative

Classification of Types of Research according to the Type of Data Used

QUAN
TITATI
VE

QUANTITATIVE – **based on positivism, uses** deduction **(Theory – forming hypotheses – observation – testing hypotheses – interpretation and generalization). It is based on theory and presupposes a research project.**

QUALITATIVE – **based on phenomenology, ethnomethodology, symbolic interactionism (interpretative paradigm), uses** induction **(observation – revealing regularity – conclusions – theory). The aim is to reveal the meaning of information (narrative sociology).**

Classification of Types of Research according to the Type of Data Used

QUANTITATIVE – **Quantitative research means collecting and analyzing numerical data to describe characteristics, find correlations, or test hypotheses.**

QUAN
TITATI
VE

QUALITATIVE – **Qualitative research involves collecting and analyzing non-numerical data to understand concepts, opinions or experiences.**

Classification of Types of Research according to the Type of Data Used

QUALI
TATIVE

QUALITATIVE RESEARCH –

Qualitative research involves collecting and analyzing non-numerical data (e.g., text, video, or audio) to understand concepts, opinions, or experiences. It can be used to gather in-depth insights into a problem or generate new ideas for research.

Qualitative research is the opposite of quantitative research, which involves collecting and analyzing numerical data for statistical analysis.

Qualitative research is commonly used in the humanities and social sciences, in subjects such as anthropology, sociology, education, health sciences, history, etc.

Classification of Types of Research according to the Type of Data Used

QUALITATIVE RESEARCH –

Qualitative research question examples

QUALI TATIVE

- How does social media shape body image in teenagers?
- How do children and adults interpret healthy eating in the UK?
- What factors influence employee retention in a large organization?
- How is anxiety experienced around the world?
- How can teachers integrate social issues into science curriculums?

Classification of Types of Research according to the Type of Data Used

Qualitative VS Quantitative: Qualitative research methods focus on words and meanings, while quantitative research methods focus on numbers and statistics.

So ask yourself and answer the question first. Is your research more concerned with measuring something or interpreting something?

One can also create a mixed methods research design that has elements of both.

QUALI
TATIVE

QUANTITATIVE

Advantages of quantitative research	Disadvantages of quantitative research
A. Testing and validating theories. B. Can be generalized for population. C. The researcher can construct situations in such a way to eliminate interfering variables and prove the relation cause-consequence. D. Relatively fast and direct data collection. E. Provides precise, numeric data. F. Relatively fast data analysis (use of computers). G. Results are relatively independent from the researcher. H. It is useful while examining large groups.	A. Categories and theories used by the researcher do not need to reflect local specialties. B. The researcher may disregard phenomena because he/she is focused only on certain theory and its testing and not on developing the theory. C. Acquired knowledge may be too abstract and general to be applied in local conditions. D. In a reductive way, the researcher is restricted in data gathering.

Examples of quantitative research methods	Examples of qualitative research
experiment, (quasi-experiment) correlative examination more specialized normative examination longitudinal study time series analysis Q-methodology Cluster analysis One-dimensional and multi-dimensional scaling Operative research	Case study Ethnography (including observation and participation observation) Grounded theory Examining narrations based on language examination Ethnomethodology and conversation analysis Discourse analysis, semiotics Document and text analysis

QUANTITATIVE

	Quantitative research	Qualitative research
Philosophical source	positivism	Phenomenology, anthropology, hermeneutics
Aim	Gaining an objective proof, verifying theory / hypotheses	Understanding human behavior in natural environment
Character	objective	subjective
Relationship to a theory	Verifying or rejecting a theory	theory creation
Thought procedure	deduction	induction
Starting point/ the beginning of research	Draws on theory and hypotheses	Starts with entering the ground space
Planning research	Is thoroughly prepared at the beginning, written project following a given structure	The plan is formed during work, research questions and methods may be subject to change => more flexible
Course of research	Systematically tests hypotheses for being correct, finds causal relationships	Gathers a large number of data on specific human behavior and its context, it is recorded and interpreted; hypotheses spring up along the way
Number of examined persons	Representative Hample, large number (usually)	Student, class, school
Techniques, methods	experiment (manipulating with variables), questionnaire, testing, standardized observation etc.	Long-term practical research, observation with different levels of participation, the researcher communicates with informants during gathering data without interfering in events

	Quantitative research	**Qualitative research**
Data processing	Quantitative, computer, statistical, data interpretation	Qualitative encoding, analysis, interpretation
Reliability of results	Done with standard procedures, found statistically (validity, reliability); the research can be repeated	Problematic – the results are subjective; secured via a triangle of data, methods, researchers, theory (data are interpreted by more researchers, comparing with similar results, similar individuals in similar context, using more methods, participants' approving of final report)
Results Form of final report	Generalization of results for population, finding rules; Brief, apposite research report following widely accepted structure: 1/ research topic 2/ methodology 3/ data analysis 4/ results discussion	Explaining human behavior in a certain context; detailed, ether interpretation or only descriptive report, deep narration
Validity of results	Attempt to arrive at results valid for the whole population	Validity for a given class, student or school
Meaning	Prediction, rules	Description, understanding, meaning

QUALITATIVE

Advantages of qualitative research	Disadvantages of qualitative research
I. It provides detailed description and form during examining an individual, group, event or phenomenon. II. It treats a phenomenon in natural environment. III. It makes it possible to study processes. IV. It makes it possible to propose theories. V. It reacts well to local situations and conditions. VI. It looks for local (idiographic) causative relationships. VII. It assists in initial exploration of phenomena.	I. It may not be possible to generalize the acquired knowledge for population and in different environment. II. It is difficult to make quantitative predictions. III. It is more difficult to test hypotheses and theories. IV. Data analysis and collection are often time consuming stages. V. Results are easily influenced by the researcher and his/her personal preferences.

Have a nice day!
Yours sincerely