

Observation and Research question

Specifying the stages of research

Choice of material

Choice of measurable variables

Choice of methods

Setting the attainable key objectives

Doing exploratory research

Specifying the research gap

Formulating the hypothesis

Setting the range of tasks

Prof Andrei Bogatyrev



Testing the

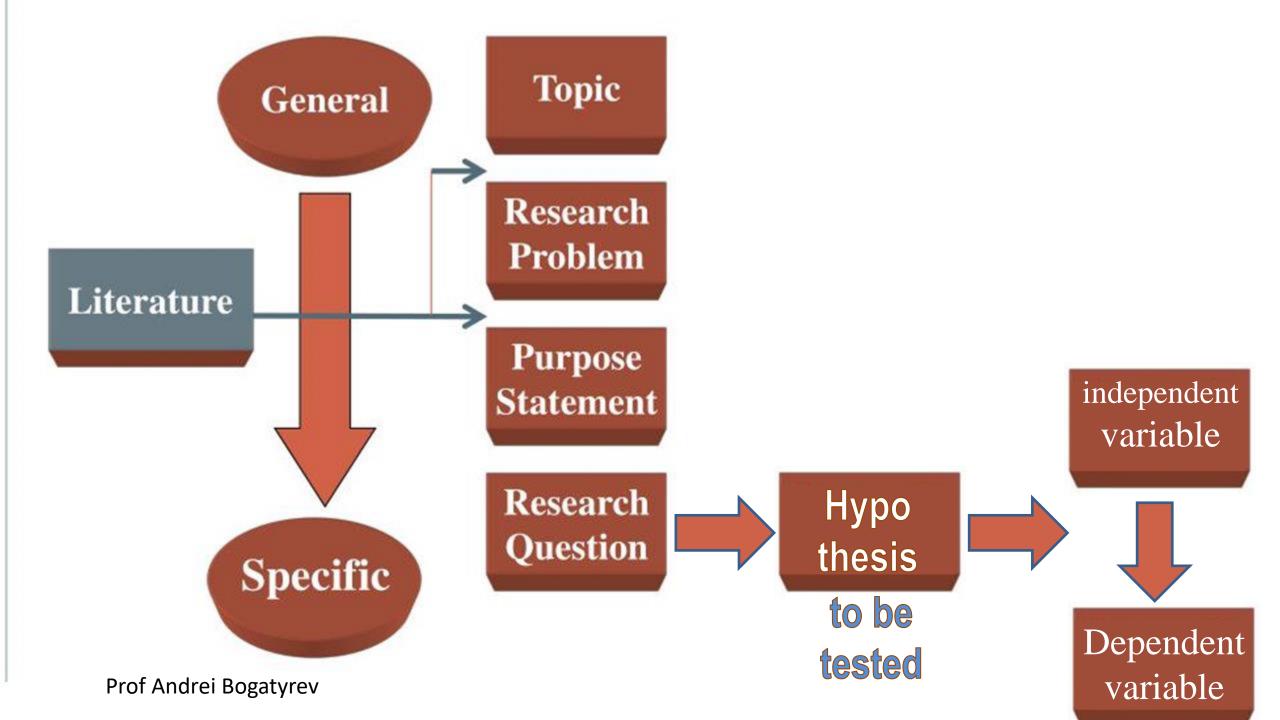
Data collection

Collected Data Analysis

hypothesis

Making a discovery

Description & Analysis of Results



#### 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?

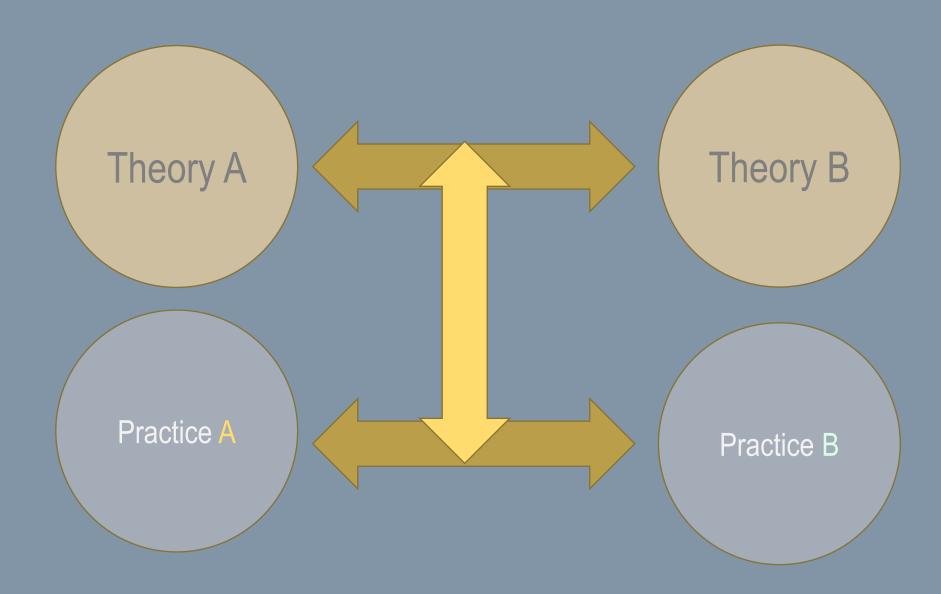
Research [rɪ'sɜːtʃ]

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

#### WHAT IS RESEARCH?

- Research [rɪ'sɜːtʃ]
- 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.

#### Research Problem highlights a contradiction



#### **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

Prof Andrei Bogatyrev

IMRAD			
Стандартная структура научной статьи			
Title	Указывается тема исследования, автор, аффилиация.		
(Название статьи)	В студенческих сборниках также научный руководитель.		
Annotation	Конкретизирует содержание статьи и кратко отражает		
(Аннотация)	структуру IMRAD		
Key Words	Указываются ключевые термины и понятия исследования		
(Ключевые слова) Introduction	Profesive auticati Hobiano off aut is epoemat: Hobia is account		
(Введение)	Проблема, актуальность, новизна, объект и предмет; цели и задачи;		
(введение)	Аналитический обзор литературы; ключевые понятия исследования.		
Methods	Методы, материал анализа, условия эксперимента, методики и		
(Методы)	средства проведения исследования		
Results	Анализ, интерпретация и первичное обобщение полученных в		
(Результаты)	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.		
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Работа с источниками			
Контрольное количество проанализированных источников не	0 баллов		
соответствует установленному количеству по плану.			
Контрольное количество проанализированных источников соответствует	1 балл		
установленному количеству по плану.			
Обозначенные точки зрения на вопрос не подтверждаются ссылками на	0 баллов		
источники.			
Обозначенные точки зрения на вопрос подтверждаются ссылками на	1 балл		
источники.			
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	1 балл		
основу своего исследования.			
Автор уточняет (и в чем-то дорабатывает) устоявшуюся концепцию (или	2 балла		
одну из многих) как основу своего исследования.			
Автор выступает с принципиально новой концепцией, ложащейся в	4 балла		
основу исследования.			
Prof Andrei Bogatyrev			
Возможная оценка:	от 0 до 10 баллов		

#### The research methods



Qualitative

- Classroom observation
- Introspective method



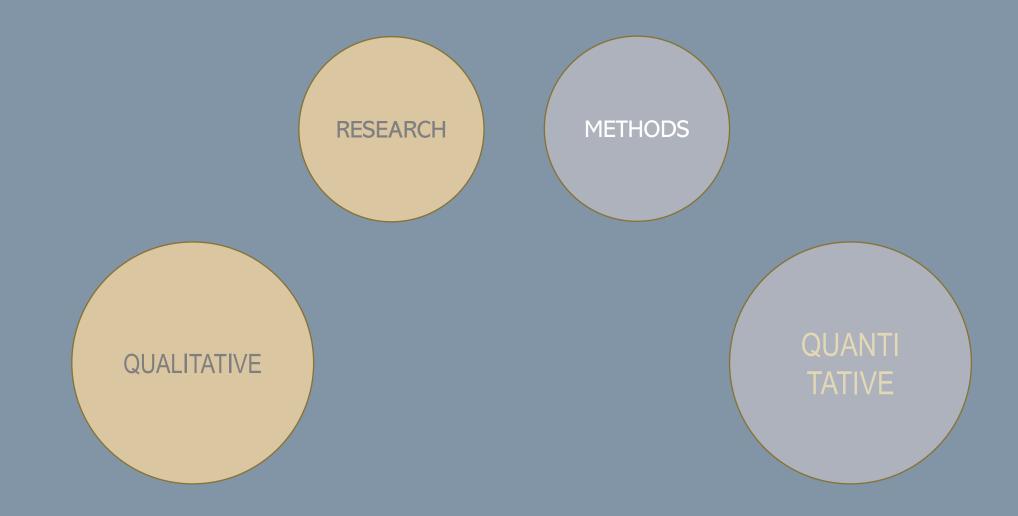
Survey

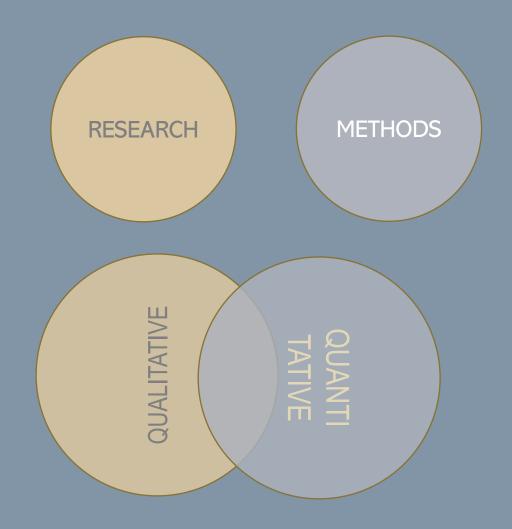
- Questionnaires
- Feedback

Quantitative

- Experiment
- Description
- Quasi-experiment

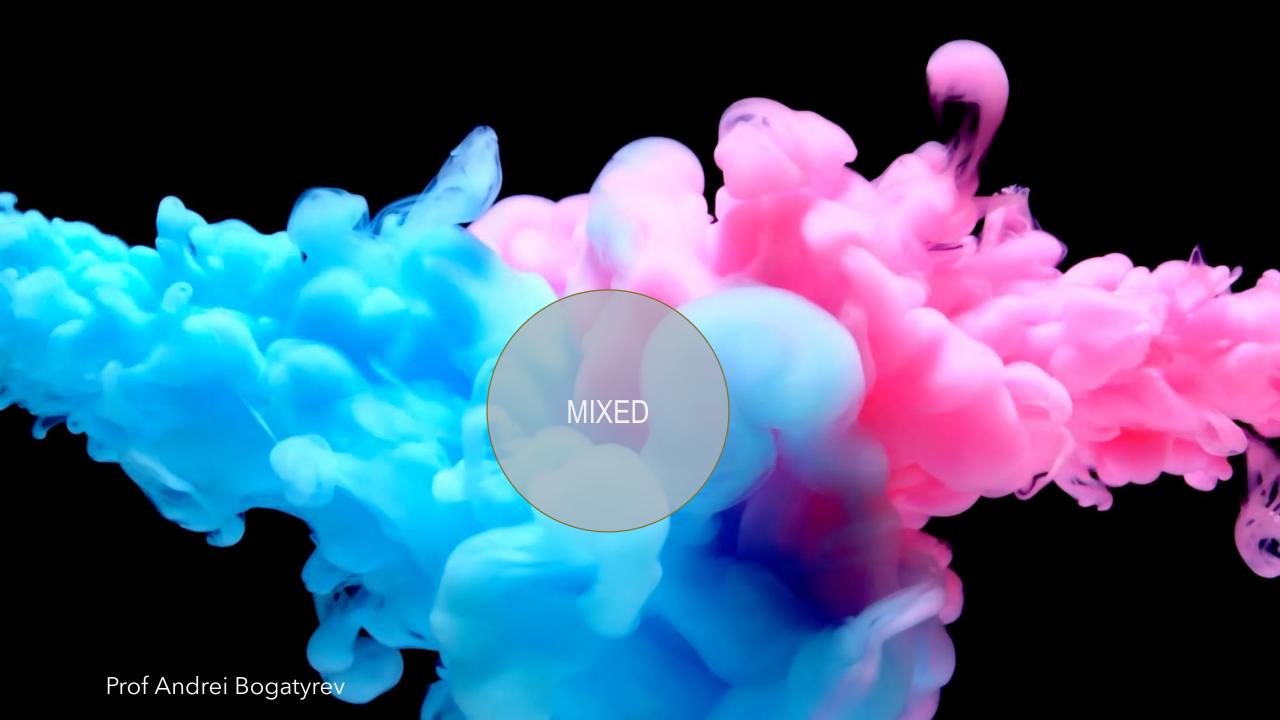
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#### Research

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exploratory [Ik'sploret(e)rI], [ek-], [-splo:-]
explanatory [Ik'splænet(e)rI], [ek-]
descriptive [dI'skrIptIv]
Qualitative ['kwolItetIv]
Quantitative ['kwontItetIv]; ['kwontI, tetIv, -, tetItIv]
experiment [Ik'sperIment],
quasi ['kweIzaI], ['kwo:zI]
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#### METHODS

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

	Description	Example
THEORETICAL	<ul> <li>uses purely theoretical methods (analysis, synthesis, induction, deduction, modeling)</li> <li>usually does not work with specific data</li> <li>specific phenomena are viewed from a theoretical point of view</li> </ul>	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	<ul> <li>always works with specific data</li> <li>reaches specific pieces of knowledge via exact methods</li> <li>its subjects are animate subjects (teachers, students) or inanimate objects (textbooks, essays written by students)</li> </ul>	A novice teacher (Šimoník, 1994). Specific teachers, specific methods (questionnaire), arrives at specific results.

#### DIFFER ENTIATION OF GENER AL SCIENTIFIC METHODS R FLATIVE TO EXPLANATION AND INTER PRETATION

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

Prof Andrei Bogatyrev

#### 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)

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.

Theoretical





#### 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.

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.

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.

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.

#### **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.

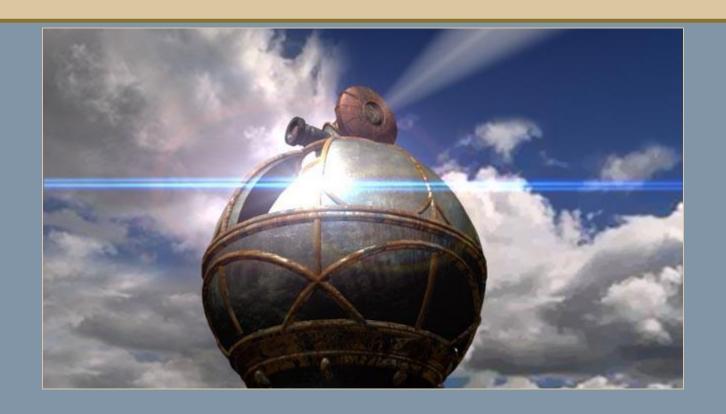
#### **Applied**

#### 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.

[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.



Research

**Exploratory** •

• Explanatory

Descriptive

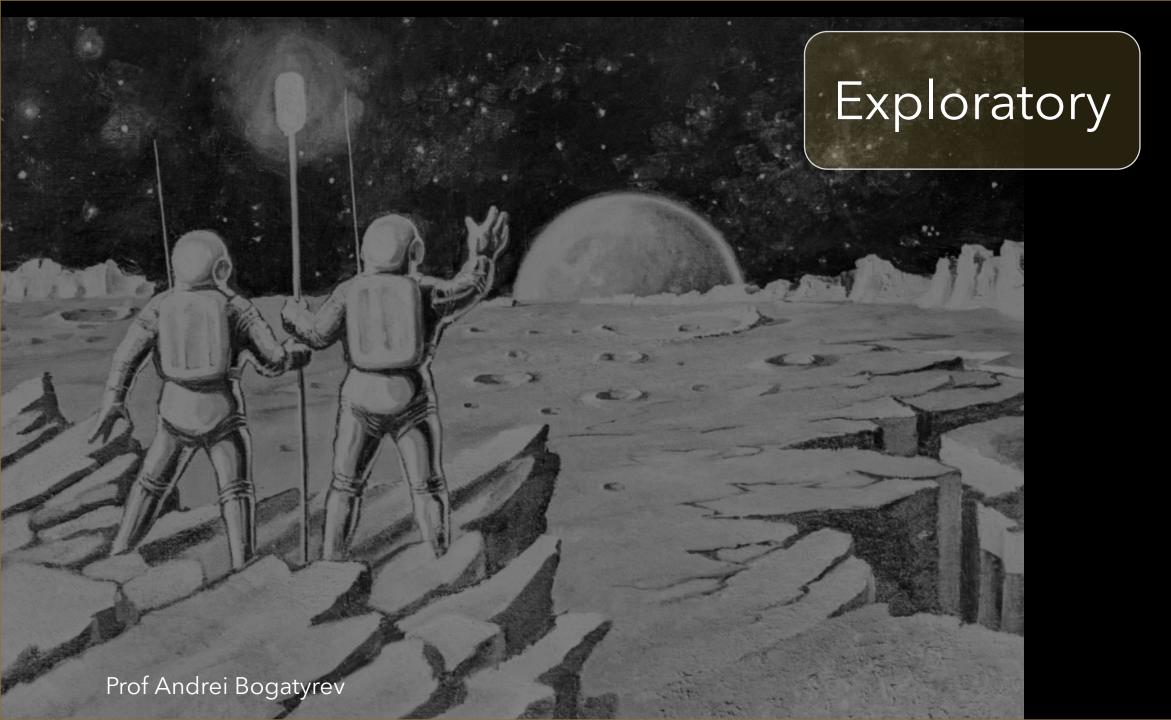
Correlational

Research

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.»

"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.

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).

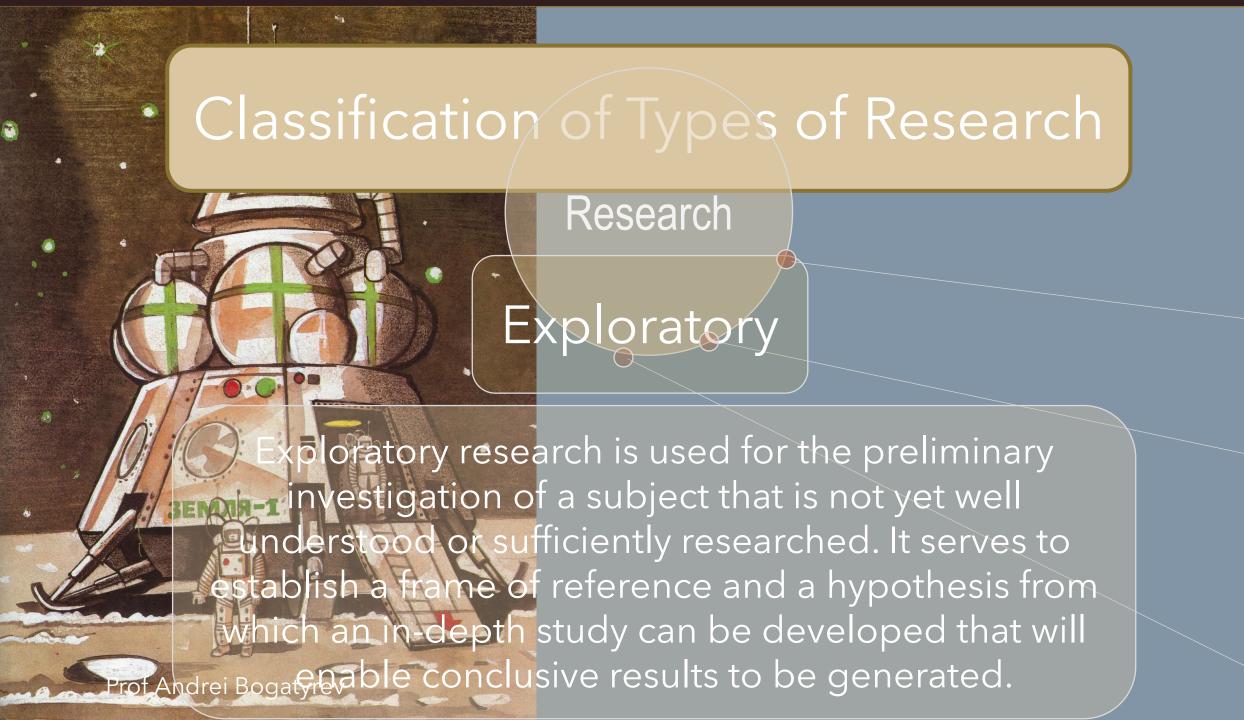
США были раздавлены. Запуск "Луны-1" и "Луны-2" доказывал, что у Хрущёва есть баллистические ракеты, способные долететь до Вашингтона, и что Америка проигрывает. А СССР, словно в издёвку, уже 10 октября запустил станцию "Луна-3", которая первой в мире выполнила гравитационный манёвр вокруг спутника и 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.





Research

Exploratory



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 Prof Andrei Bogaterable conclusive results to be generated.

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 Prof Andrei Bogatyrev in the perception of self-image.

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.

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.

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.

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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 Prof Andrei Booth Ext and its interactions with the environment.

Research

Exploratory •

• Explanatory

Descriptive

Correlational

Prof Andrei Bogatyrev



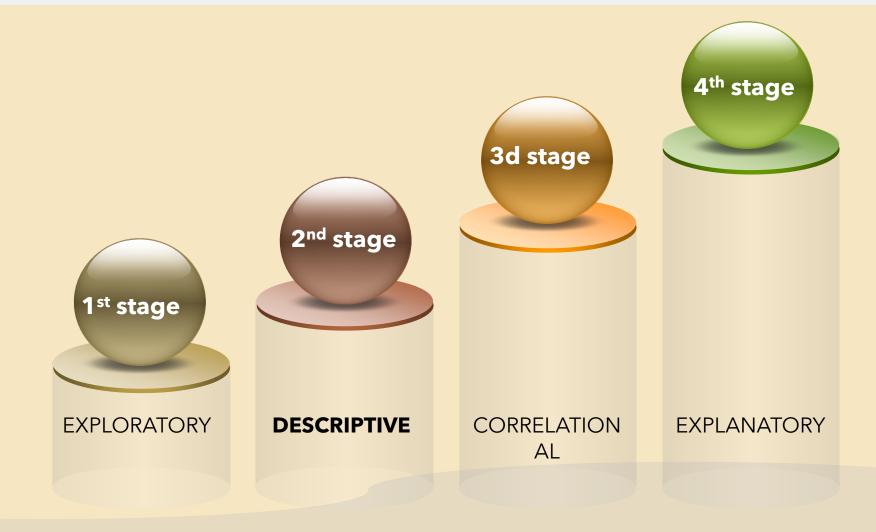
### "Methodology" yersus "Research Design"

Methodology refers to the principles, procedures, and practices that govern research, whereas research design refers to the plan used to examine the question of interest.

"Methodology" should be thought of as encompassing the entire process of conducting research (i.e., planning and conducting the research study, drawing conclusions, and disseminating the findings).

By contrast, "research design" refers to the many ways in which research can be conducted to answer the question being asked.

#### KEY STAGES AND DIALECTICS OF RESEARCH PROGRAMME



#### RELATIONSHIP BETWEEN HYPOTHESES AND RESEARCH DESIGN



### 1. It is standardly expected that dependent variable dynamics is measured

The variation should be explained in detail

Требуется детальное описание показателей и критериев

# 2. It is standardly expected that the dynamics is associated with variation of some sort of independent variable

Требуется детальное описание изменений в воздействии независимой переменной на зависимую

#### KEY STAGES AND DIALECTICS OF MEASURED VARIABLES

Hypotheses can take many different forms depending on the type of research design being used.

Some hypotheses may simply describe how two things may be related. For example, in correlational research, a researcher might hypothesize that alcohol intoxication is related to poor decision making. In other words, the researcher is hypothesizing that there is a relationship between using alcohol and decision making ability (but not necessarily a causal relationship).

#### KEY STAGES AND DIALECTICS OF MEASURED VARIABLES

Hypotheses can take many different forms depending on the type of research design being used.

However, in a study using a randomized controlled design, the researcher might hypothesize that using alcohol causes poor decision making.

Therefore, as may be evident, the hypothesis being tested by a researcher is largely dependent on the type of research design being used.

#### FALSIFIABILITY OF HYPOTHESES

According to the 20th-century philosopher Karl Popper, hypotheses must be falsifiable (Popper, 1963). In other words, the researcher must be able to demonstrate that the hypothesis is wrong. If a hypothesis is not falsifiable, then science cannot be used to test the hypothesis. For example, hypotheses based on religious beliefs are not falsifiable.

Therefore, because we can never prove that faith-based hypotheses are wrong, there would be no point in conducting research to test them. Another way of saying this is that the researcher must be able to reject the proposed explanation (i.e., hypothesis) of the phenomenon being studied.

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#### THE NULL HYPOTHESIS

#### The null hypothesis

always predicts that there will be no differences between the groups being studied.

By contrast, the alternate hypothesis predicts that there will be a difference between the groups.

In our example, the null hypothesis would predict that the exercise group and the no-exercise group will not differ significantly in the level of performance.

#### THE RESEARCH STUDY

After articulating the hypothesis, the next step involves actually conducting the experiment (or research study).

For example, if the study involves investigating the effects of exercise on levels of cholesterol, the researcher would design and conduct a study that would attempt to address that question. A key aspect of conducting a research study is measuring the phenomenon of interest in an accurate and reliable manner. In this example, the researcher would collect data on the performance levels of the study participants by using an accurate and reliable measurement device.

Then, the researcher would compare the levels of the two groups to see if exercise had any effects.

#### ANALYSES

After conducting the study and gathering the data, the next step involves analyzing the data, which generally calls for the use of statistical techniques.

The type of statistical techniques used by a researcher depends on the design of the study, the type of data being gathered, and the questions being asked.

It is important to be aware of the role of statistics in conducting a research study. In short, statistics help researchers minimize the likelihood of reaching an erroneous conclusion about the relationship between the variables being studied.

#### \*\*\*ACCURACY VS. RELIABILITY

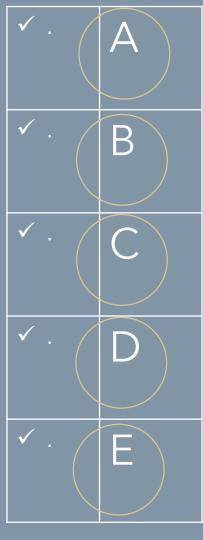
When talking about measurement in the context of research, there is an important distinction between being accurate and being reliable.

Accuracy refers to whether the measurement is correct, whereas reliability refers to whether the measurement is consistent.

An example may help to clarify the distinction. When throwing darts at a dart board, "accuracy" refers to whether the darts are hitting the bull's eye (an accurate dart thrower will throw darts that hit the bull's eye).

#### \*\*\*ACCURACY VS. RELIABILITY

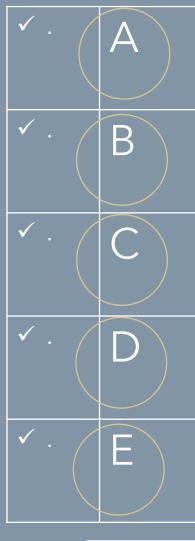
"Reliability," on the other hand, refers to whether the darts are hitting the same spot (a reliable dart thrower will throw darts that hit the same spot). Therefore, an accurate and reliable dart thrower will consistently throw the darts in the bull's eye. As may be evident, however, it is possible for the dart thrower to be reliable, but not accurate. For example, the dart thrower may throw all of the darts in the same spot (which demonstrates high reliability), but that spot may not be the bull's eye (which demonstrates low accuracy). In the context of measurement, both accuracy and reliability are equally important.



Complete the text. Fill in the blanks based on proper research terms choice. Translate.

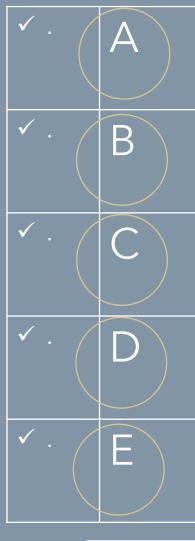
**Experimental research:** In its simplest form, *experimental research* involves comparing two groups on one outcome measure to test some \_\_\_\_\_ regarding causation.

А	В	С	D	E
Methods	Potential	Technology	Hypothesis	Tools



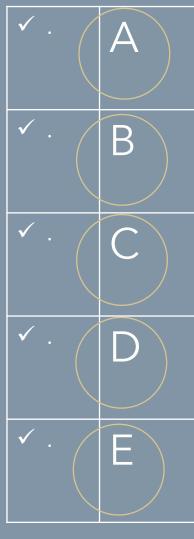
Complete the text. Fill in the blanks based on proper research terms choice. Translate.

А	В	С	D	Е
Data	Prediction	Variables	Hypotheses	Phenomena



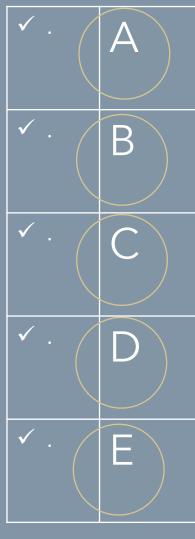
Complete the text. Fill in the blanks based on proper research terms choice. Translate.

А	В	С	D	Е
Data	Prediction	Variables	Hypotheses	Phenomena



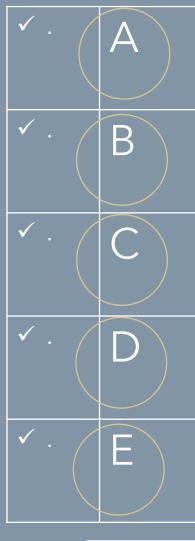
Complete the text. Fill in the blanks based on proper research terms choice. Translate.

А	В	С	D	E
Data	Prediction	Variables	Hypotheses	Phenomena



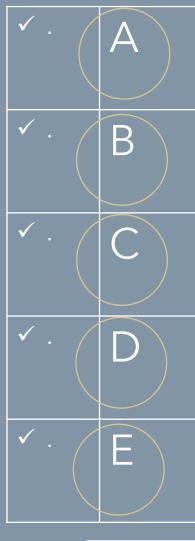
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A	В	С	D	E
Data	Prediction	Variables	Hypotheses	Phenomena



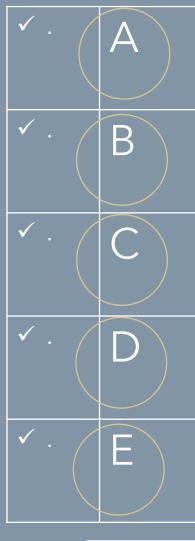
Complete the text. Fill in the blanks based on proper research terms choice. Translate.

А	В	С	D	E
Data	Prediction	Variables	Hypotheses	Phenomena



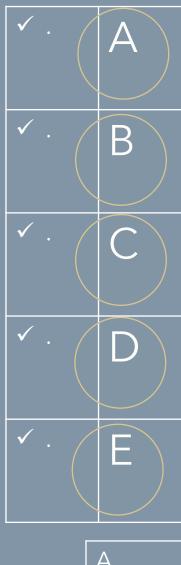
Complete the text. Fill in the blanks based on proper research terms choice. Translate.

А	В	С	D	E
Data	Prediction	Variables	Hypotheses	Phenomena



Complete the text. Fill in the blanks based on proper research terms choice. Translate.

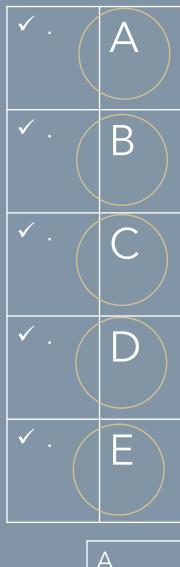
А	В	С	D	E
Data	Prediction	Variables	Hypotheses	Phenomena



Complete the text. Fill in the blanks based on proper research terms choice. Translate.

- (1) .... is most simply and comfortably defined as an array of (2) .... that might prove helpful in advancing student learning and may be measured in how and why individuals behave.
- (3) ... can refer to material objects of use to humanity, such as machines or hardware, but it can also encompass broader themes, including systems, (4) ... of organization, and techniques.

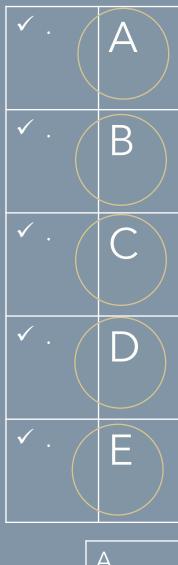
A	В	С	D	Е
Methods  Prof Andrei Bogatyre	Potential	Technology	Technology of Education / Educational Technology	Tools



Complete the text. Fill in the blanks based on proper research terms choice. Translate.

- (1) ... is most simply and comfortably defined as an array of (2) .... that might prove helpful in advancing student learning and may be measured in how and why individuals behave.
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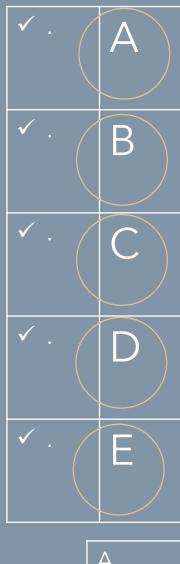
А		В	С	D	Е
Metho		Potential		Technology Of Education / Educational	Tools
Prof A	Andrei Bogaty	rev		Technology	



Complete the text. Fill in the blanks based on proper research terms choice. Translate.

- (1) ... is most simply and comfortably defined as an array of (2) .... that might prove helpful in advancing student learning and may be measured in how and why individuals behave.
- (3) ... can refer to material objects of use to humanity, such as machines or hardware, but it can also encompass broader themes, including systems, (4) ... of organization, and techniques.

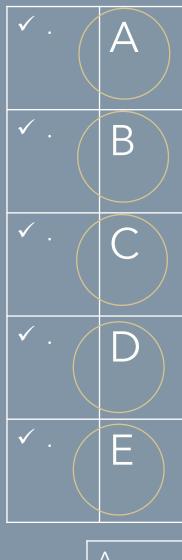
А		В	С	D	Е
Metho		Potential		Technology Of Education / Educational	Tools
Prof A	Andrei Bogaty	rev		Technology	



Complete the text. Fill in the blanks based on proper research terms choice. Translate.

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Sample question 2.1.

Sample question 2.2.

Sample question 2.3.

Sample question 2.4.

Sample question 2.5.

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Sample question 1.1.

Sample question 1.2.

Sample question 1.3.

Sample question 1.4.

Sample question 1.5.

Sample question 1.6.

Sample question 1.7.

Sample question 2.1.

Sample question 2.2.

Sample question 2.3.

Sample question 2.4.

Sample question 2.5.

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Sample question 1.1.

Sample question 1.2.

Sample question 1.3.

Sample question 1.4.

Sample question 1.5.

Sample question 1.6.

Sample question 1.7.

### 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 vari- ables; single cases may be misleading
Correlational	To detect naturally occurring relationships; to assess how well one variable predicts another	Compute statistical association, some- times 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 Andrei B	To explore cause and effect ogatyrev	Manipulate one or more factors; use random assignment	The independent variable(s)	Specifies cause and effect, and variables are controlled	Sometimes not fea- sible; results may not generalize to other contexts; not ethical to manipu- late certain variable

	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 2 Often several disciplines work of one discipline
- 3. Generalisations are preferred;
- 4. Forecasting approach is implemented 4 Aims to say how things can be hanged
- 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
- together for solving the problem
- 3 Often researches individual cases without the aim to generalise
- 5 Acknowledges that other variables are constant by changing
- 6 Reports are compiled in a common language

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	Exploratory research	Conclusive research
Structure	Loosely structured in design	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

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### OBSERVATION

Drocos type	Example (Process + participants underlined;
Process type	Process in Bold; <i>circumstances</i> 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 Prof Andrei Boga	there is quite a large group of ethnic Chinese in Singapore







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.

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').

Qualitative

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

Quantitative

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.

Quantitative

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





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).

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



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

#### 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.

#### QUALITATIVE RESEARCH -

#### Qualitative research question examples

- . 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?



**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.

#### QUAN TITATI VE

### Advantages 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.
- 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.

### Disadvantages of quantitative research

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

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	AN \	
TITA	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 samples, large number (usually)	Student, class, school
Techniques, methods  Prof Andrei Bogatyrev	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	Generalization of results for population,	Explaining human behavior in a
Form of final report	finding rules; Brief, apposite research report following widely accepted structure: 1/ research topic 2/ methodology 3/ data analysis 4/ results discussion	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 Andrei Bogatyr		Description, understanding, meaning

### Advantages of qualitative research

- I. It provides detailed description and form during examining an individual, group, event or phenomenon.
- It treats a phenomenon in natural environment.
  - 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.

### Disadvantages of qualitative research

- 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.

Prof<sup>'</sup>Andrei Bogatyrev

QUALIII

quantitative	mixed .	qualitative
research	research	research
methods	methods	methods
Descriptive; Exploratory; Quasi- experimental; Experimental;	Interview; Questionnaire;	Classroom observations; Interactional analysis; Discourse analysis; Case studies;

### MIXED METHODS

Mixed methods research combines elements of quantitative research and qualitative research in order to answer your research question. Mixed methods can help you gain a more complete picture than a standalone quantitative or qualitative study, as it integrates benefits of both methods.

Mixed methods research is often used in the behavioral, health, and social sciences, especially in multidisciplinary settings and complex situational or societal research.

### MIXED METHODS

Mixed methods research question examples

- To what extent does the frequency of traffic accidents (quantitative) reflect cyclist perceptions of road safety (qualitative) in Amsterdam?
- How do student perceptions of their school environment (qualitative) relate to differences in test scores (quantitative)?

### MIXED METHODS

Mixed methods research question examples

- How can voter and non-voter beliefs about democracy (qualitative) help explain election turnout patterns (quantitative) in Town X?
- How do average hospital salary measurements over time (quantitative) help to explain nurse testimonials about job satisfaction (qualitative)?

MIXED METHOD

Mixed methods research choice

Mixed methods research may be the right choice if your research process suggests that quantitative or qualitative data alone will not sufficiently answer your research question. There are several common reasons for using mixed methods research:

MIXED METHOD

#### Mixed methods research efficiency examples

• Generalizability: Qualitative research usually has a smaller sample size, and thus is not generalizable. In mixed methods research, this comparative weakness is mitigated by the comparative strength of "large N," externally valid quantitative research.



#### Mixed methods research efficiency examples

• Contextualization: Mixing methods allows you to put findings in context and add richer detail to your conclusions. Using qualitative data to illustrate quantitative findings can help "put meat on the bones" of your analysis.



#### Mixed methods research efficiency examples

• Credibility: Using different methods to collect data on the same subject can make your results more credible. If the qualitative and quantitative data converge, this strengthens the validity of your conclusions. This process is called triangulation.

MIXED METHOD

#### Mixed methods research

- As you formulate your research question, try to directly address how qualitative and quantitative methods will be combined in your study.
- ☐ If your research question can be sufficiently answered via standalone quantitative or qualitative analysis, a mixed methods approach may not be the right fit.

MIXED MFTHOD

#### Mixed methods research EXAMPLE

- ☐ You want to research cycling safety in high-traffic areas of Amsterdam. If you're interested in the frequency of accidents and where they occur, this could be a straightforward quantitative analysis.
- ☐ If you're interested in the nature of complaints submitted by cyclists, or their perceptions about cycling in particular areas, then a qualitative approach may fit best.

MIXED METHOD

Mixed methods research EXAMPLE

☐ But mixed methods might be a good choice if you want to meaningfully integrate both of these questions in one research study.

MIXED METHOD Prof Andrei Bogatyrev

#### Mixed methods research EXAMPLE

- ☐ But mixed methods might be a good choice if you want to meaningfully integrate both of these questions in one research study.
- ☐ For example, you could use a mixed methods design to investigate whether areas perceived as dangerous have high accident rates, or to explore why specific areas are more dangerous for cyclists than others.

MIXED METHOD

#### Mixed methods research EXAMPLE

□ Keep in mind that mixed methods research doesn't just mean collecting both types of data; you need to carefully consider the relationship between the two and how you'll integrate them into coherent conclusions. Mixed methods can be very challenging to put into practice, so it's a less common choice than standalone qualitative or qualitative research.

MIXED METHOD

## MIXED METHOD RESEARCH DESIGNS

☐ There are different types of mixed methods research designs. The differences between them relate to the aim of the research, the timing of the data collection, and the importance given to each data type.

As you design your mixed methods study, also keep in mind:

- Your research approach (inductive vs deductive)
- Your research questions
  - What kind of data is already available for you to use
  - What kind of data you're able to collect yourself.

**MIXED** 

## MIXED METHOD RESEARCH DESIGNS

☐ Here are a few of the most common mixed methods designs:



## MIXED METHOD RESEARCH DESIGNS

- In a convergent parallel design, you collect quantitative and qualitative data at the same time and analyze them separately. After both analyses are complete, compare your results to draw overall conclusions.
- □ Example: Convergent parallel design in your research on cycling safety in Amsterdam, you undertake both sides of your research simultaneously:

# ENT PARALL

## MIXED METHOD RESEARCH DESIGNS

- On the qualitative side, you analyze cyclist complaints via the city's database and on social media to find out which areas are perceived as dangerous and why.
- On the quantitative side, you analyze accident reports in the city's database to find out how frequently accidents occur in different areas of the city.
- ☐ When you finish your data collection and analysis, you then compare results and tie your findings together.

## MIXED METHOD RESEARCH DESIGNS

- ☐ In an embedded design, you collect and analyze both types of data at the same time, but within a larger quantitative or qualitative design. One type of data is secondary to the other.
- ☐ This is a good approach to take if you have limited time or resources. You can use an embedded design to strengthen or supplement your conclusions from the primary type of research design.

## MIXED METHOD RESEARCH DESIGNS

Example: Embedded design as part of a quantitative study testing whether the number of cyclist complaints about an area correlates with the number of accidents, you could "embed" a series of qualitative interviews with cyclists who submitted complaints to further strengthen your argument. The bulk of your research remains quantitative.

## ESIG

## MIXED METHOD RESEARCH DESIGNS

- ☐ In an explanatory sequential design, your quantitative data collection and analysis occurs first, followed by qualitative data collection and analysis.
- ☐ You should use this design if you think your qualitative data will explain and contextualize your quantitative findings.

## ESIG

## MIXED METHOD RESEARCH DESIGNS

- ☐ Example: Explanatory sequential
- □ You analyze the accident statistics first and draw preliminary conclusions about which areas are most dangerous. Based on these findings, you conduct interviews with cyclists in high-accident areas and analyze complaints qualitatively.
- ☐ You can utilize the qualitative data to explain why accidents occur on specific roads, and take a deep dive into particular problem areas.

## ESIG

## MIXED METHOD RESEARCH DESIGNS

- In an exploratory sequential design, qualitative data collection and analysis occurs first, followed by quantitative data collection and analysis.
- ☐ You can use this design to first explore initial questions and develop hypotheses. Then you can use the quantitative data to test or confirm your qualitative findings.
- Example: Exploratory sequential design. You first interview cyclists to develop an initial understanding of problem areas, and draw preliminary conclusions. Then you analyze accident statistics to test whether cyclist perceptions line up with

Prof Andre Bagayraccidents occur.

#### a convergent parallel design

The researcher collects quantitative and qualitative data at the same time and analyzes them separately. After both analyses are complete, the researcher compares the results to draw overall conclusions.

#### an embedded design

The researcher collects and analyzes both types of data at the same time, but within a larger quantitative or qualitative design.

#### an explanatory sequential design

•Quantitative data collection and analysis occurs first, followed by qualitative data collection and analysis.

MIXED

#### an exploratory sequential design

• Qualitative data collection and analysis occurs first, followed by quantitative data collection and analysis.

## 

## MIXED METHOD RESEARCH DESIGNS ADVANTAGES

#### ☐"Best of both worlds" analysis

□ Combining the two types of data means you benefit from both the detailed, contextualized insights of qualitative data and the generalizable, externally valid insights of quantitative data. The strengths of one type of data often mitigate the weaknesses of the other.



## 

## MIXED METHOD RESEARCH DESIGNS ADVANTAGES

### ☐ Method flexibility

- ☐ For example, solely quantitative studies often struggle to incorporate the lived experiences of your participants, so adding qualitative data deepens and enriches your quantitative results.
- ☐ Solely qualitative studies are often not very generalizable, only reflecting the experiences of your participants, so adding quantitative data can validate your qualitative findings.

### MIXED METHOD RESEARCH DESIGNS DISADVANTAGES

### ☐ Heavy Workload

☐ Mixed methods research is very labor-intensive. Collecting, analyzing, and synthesizing two types of data into one research product takes a lot of time and effort, and often involves interdisciplinary teams of researchers rather than individuals. For this reason, mixed methods research has the potential to cost much more than standalone studies.

### MIXED METHOD RESEARCH DESIGNS DISADVANTAGES

### □Different or conflicting results

- If your analysis yields conflicting results, it can be very challenging to know how to interpret them in a mixed methods study. If the quantitative and qualitative results do not agree or you are concerned you may have confounding variables, it can be unclear how to proceed.
- Due to the fact that quantitative and qualitative data take two vastly different forms, it can also be difficult to find ways to systematically compare the results.

