Research in Education

1. lecture: Basic approaches to investigating education

Mgr. Oksana Stupak, PhD, DrS

The **aim** of the course is to make students familiar with the specific form of research and its realization which is related to pedagogical staff (teachers, teachers' assistants) and to acquire basic methodological knowledge and skills.

Topics:

- Basic approaches to investigating education
- Research Project
- Structure of research study
- Data Collection Methods
- Observation
- (Quasi)experiments
- Data Collection Methods
- Tests
- Qualitative Data Analysis
- Descriptive Statistical Analysis

Schedule of lessons

lectures

Fr. 8.00-8.50

22.09, 29.09, 6.10,
13.10, 20.10, 27.10,
3.11, 10.11, 24.11,
1.12, 8.12, 15.12

Seminars

Fr. 22. 9. 9:00–11:50,
Fr. 6. 10. 9:00–11:50
Fr. 3. 11. 9:00–11:50,
Fr 1. 12. 9:00–11:50

Conditions for completing the course

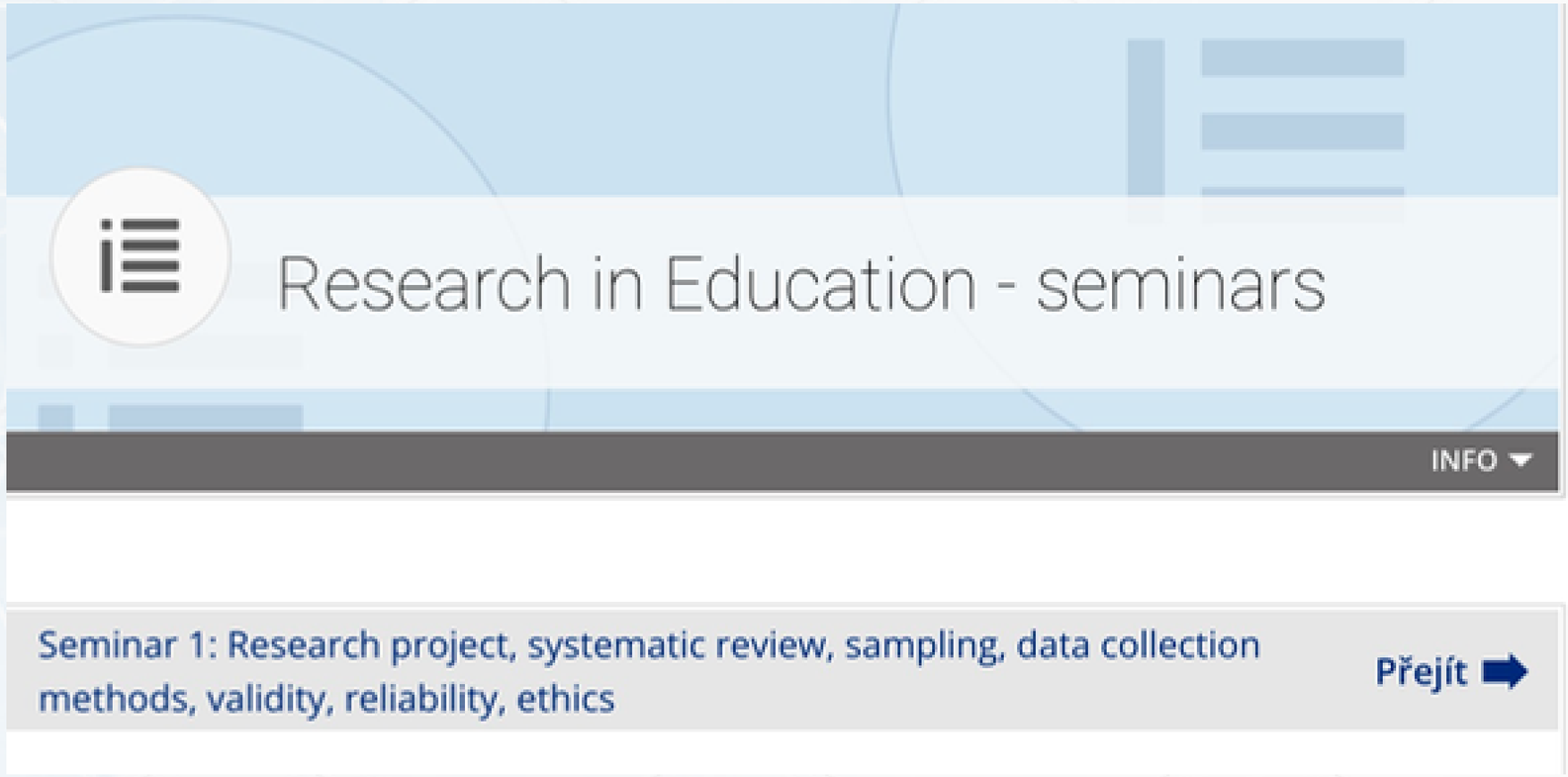
1. **Active participation in the seminar, preparation for the seminar**

2. **Successful completion of the final test (9-15 p.)**

3. **Task 1 - Qualitative analysis of reflective journals (10 p.)**

4. **Task 2 - poster with results of QN analysis (10 p.)** (due at the latest 2 days before the 4th seminar). You will present the poster in groups at the last seminar.

IS: interactive basis



seminars

- Seminar 1: Research project, systematic review, sampling, data collection methods, validity, reliability, ethics
- Seminar 2: Interview, observation, qualitative data analysis
- Seminar 3: Questionnaire, knowledge test, descriptive statistical data analysis
- Seminar 4: Research report, presentation of findings

Recommended literature for the course:

- **Creswell**, J. W. (2014). **Educational Research**: Planning, Conducting, and Evaluating Quantitative and Qualitative Research. Pearson.
- **Gay,** L. R. Mills, G.E., Airasian, P. (2012). **Educational research** : competencies for analysis and applications. Pearson
- **Cohen L.**, Manion, L., Morrison, K. (2007). **Research Methods in Education.** Taylor & Francis.
- **Citační a publikační norma APA7:** https://pedagogika.phil.muni.cz/studium/citacni-norma-apa
- **Strauss,** A., & Corbin, J. (2007). **Basics of Qualitative Research**:Techniques and Procedures for Developing Grounded Theory. Thousand Oaks: Sage.

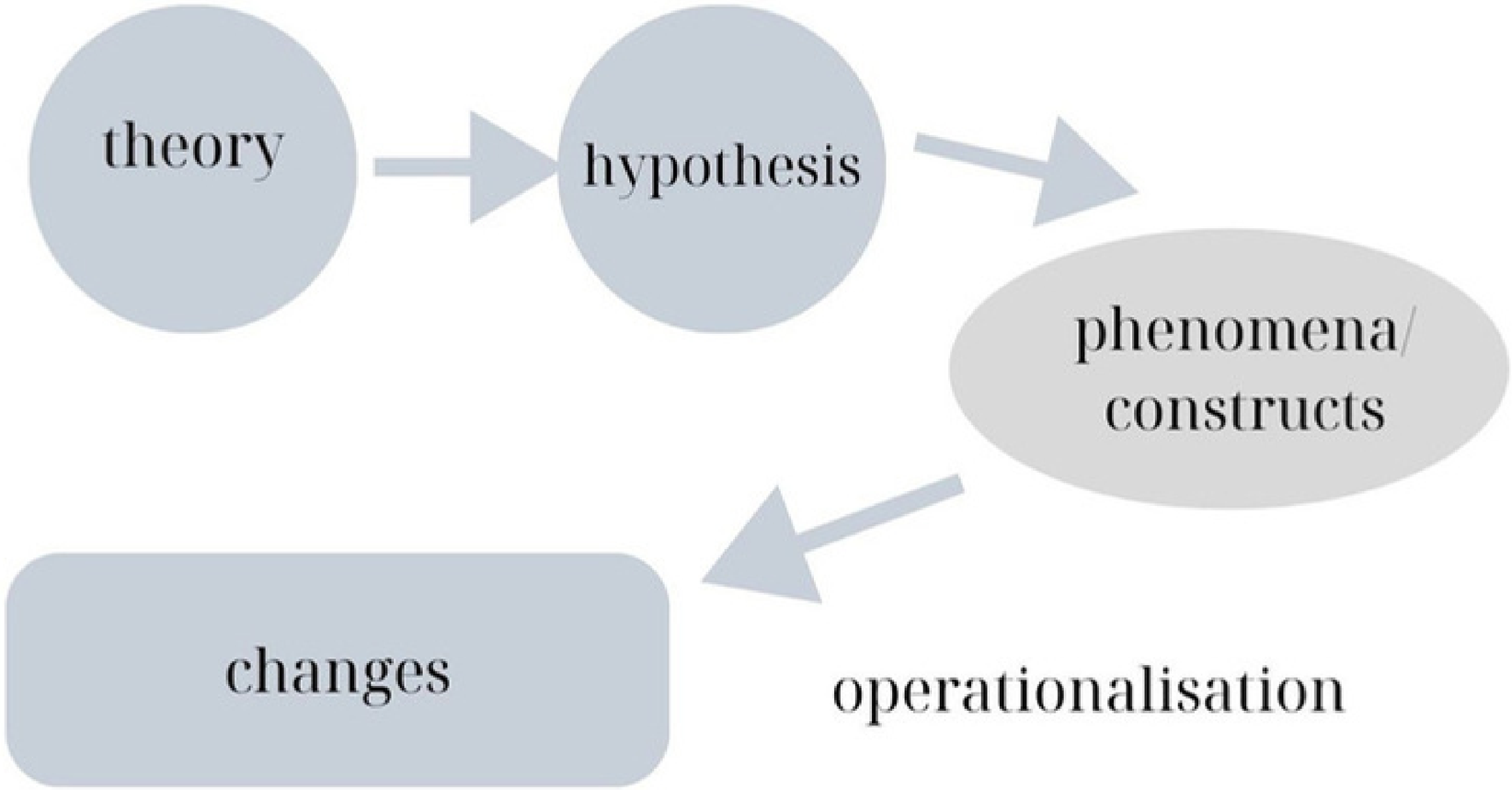
Educational research at school

S Strengths	W Weaknesses
O Opportunities	T Threats

What is educational research?

- **Educational research** ia systematic way of solving a problem that expands knowledge in the field of pedagogy
    - systematically describes, analyses and explains various phenomena of educational reality
    - therefore, there are also different types of research and functions of educational research

The procedure of scientific work



The model of empirical science

Research: a) theoretical b) **empirical** - works with real data

The basis of **empirical research** is the model of empirical science in 2 basic forms:

1/ Theory formation (construction)

- **Basic procedure:** induction
- Typical for **qualitative research**
- **Procedure:**

data collection =>
search for regularities, patterns =>
preliminary conclusions =>
verification of conclusions =>
new theory

2/ Testing/verification of theory

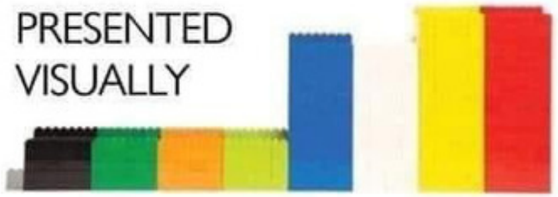
- **Verification/falsification** (confirmation, refutation) of a theory
- **Basic thought process** = deduction
- Typical for **quantitative research**
- **Procedure:** theory => hypothesis => data collection => statistical processing => refutation, acceptance of hypothesis => legitimacy of theory confirmed or questioned

DATA

SORTED

ARRANGED

PRESENTED
VISUALLY



EXPLAINED
WITH A STORY

How research helps improve pedagogical work?

Education research can:

- help you find solutions to particular problems arising in your classroom or school;
- underpin professional learning of knowledge, skills and understanding;
- connect you with sources of information and networks of professional support;
- clarify purposes, processes and priorities when introducing change – for example, to curriculum, pedagogy or assessment;
- improve understanding of your professional and policy context, organisationally, locally and nationally, enabling you to teach and lead more strategically and effectively;
- develop your agency, influence, self-efficacy and voice within your own school and more widely within the profession.

Austin, R. (2016). Researching Primary Educatition

Basic features of educational research

- Existing knowledge is confirmed or refuted, new knowledge is gained.
- It is a way of thinking; a scientific, standardized procedure,

- **striving for objectivity**, everything is documented, working with facts that are recorded, processed and interpreted;

- long-term, concentrated, **systematic**, repeated, organised activity,

- is **based on theory**, is practical = **based on practice** and results oriented to practice, has its own ethics.

- Confirmation of already known knowledge is necessary as **reality changes.**
- **More people** are involved.

- It is not usually the work of one person, it builds on someone etc.

- The results are **published**

- research is subject to public scrutiny (peer reviewers, etc.), which ensures the professional standard of the research.

What is most often investigated?

- **subjects of education**

- teacher, pupil, students

- **process**

- learning, teaching, climate, communication, textbooks
- curriculum (comparison of educational programmes)
- educational outcomes (TIMSS, PISA)

In Western Europe it is **often examined** (summarized by J. Průcha)

- **the relationship between education and the world of work** (unemployment, economic problems of education)
- **socially oriented research on educational processes** (the education of minorities, the disabled, the elderly)
- **the development and improvement of learning processes** (new media, learning in out-of-school settings)
- **evaluation and monitoring research is frequent** (results, effects of education)

Recipients of pedagogical research

- Educational research produces knowledge about educational reality for different types of addressees
  - elaboration of topics according to social need,
  - but also the treatment of topics that develop science itself
- It also develops activities to function and improve itself (methodological research).

- Public
- Teachers
- School management
- Politicians
- Researchers
- Students of teaching and education sciences
- Teachers

Where did you come across the research?

Association of Educational Research

- **Czech Association of Educational Research** (CAPV) https://capv.cz/
- **European Association for Research on Learning and Instruction** (EARLI) http://www.earli.org/
- **European Educational Research Association** (EERA) http://www.eera.ac.uk/web/eng/all/home/index.html
- **American Educational Research Association** (AERA) https://www.aera.net/

Konference CAPV-2023

1. Students motives for communication in English language teaching.
2. Emotional intelligence of student teachers for kindergarten and first grade elementary school.
3. Linking theory and practice from the perspectives of Primary 1 student teachers.
4. Perceptions of self-evaluation in prospective teachers and their educators: congruence or contradictions?
5. Climate of education: the relationship of pupil self-assessment, knowledge, attitudes and behaviour.
6. Digital technology as part of family dynamics.
7. The school special educator and his/her perspective
8. on inclusive education
9. Teaching in differentiated groups in primary schools from an equity perspective.
10. How pupils estimate the meaning of new words in the classroom German?

Research Designs and Approaches

Creswell, J. W. (2014). Educational Research: Planning, Conducting, and Evaluating Quantitative and Qualitative Research. Pearson.

Quantitative Research Characteristics

◆ Describing a research problem through a description of trends or a need for an explanation of the relationship among variables;
◆ Providing a major role for the literature through suggesting the research questions to be asked and justifying the research problem and creating a need for the direction;
◆ Creating purpose statements, research questions, and hypotheses that are specific, narrow, measurable, and observable;
◆ Collecting numeric data from a large number of people using instruments with preset questions and responses;
◆ Analyzing trends, comparing groups, or relating variables using statistical analysis, and interpreting results by comparing them with prior predictions and past research;
◆ Writing the research report using standard, fixed structures and evaluation criteria, and taking an objective, unbiased approach.

Qualitative Research Characteristics

◆ Exploring a problem and developing a detailed understanding of a central phenomenon.
◆ Having the literature review play a minor role but justify the problem.
◆ Stating the purpose and research questions in a general and broad way so as to the participants' experiences.
◆ Collecting data based on words from a small number of individuals so that the participants' views are obtained.
◆ Analyzing the data for description and themes using text analysis and interpreting the larger meaning of the findings.
◆ Writing the report using flexible, emerging structures and evaluative criteria, and including the researchers' subjective reflexivity and bias.

TABLE 1.1 • Overview of qualitative and quantitative research characteristics

	Quantitative Research	Qualitative Research
Type of data collected	Numerical data	Nonnumerical narrative and visual data
Research problem	Hypothesis and research procedures stated before beginning the study	Research problems and methods evolve as understanding of topic deepens
Manipulation of context	Yes	No
Sample size	Larger	Smaller
Research procedures	Relies on statistical procedures	Relies on categorizing and organizing data into patterns to produce a descriptive, narrative synthesis
Participant interaction	Little interaction	Extensive interaction
Underlying belief	We live in a stable and predictable world that we can measure, understand, and generalize about.	Meaning is situated in a particular perspective or context that is different for people and groups; therefore, the world has many meanings.

Gay, L. R. Mills, G.E., Airasian, P. (2012). Educational research : competencies for analysis and applications. Pearson

Examples of data collection methodologies

Quantitative Research

- Performance Tests
- Personality Measures
- Questionnaires (with closed-ended questions or openended but transferred to quan data)
- Content Analysis

Qualitative Research

- Interviews
- Open-ended questionnaires
- Observations
- Content analysis
- Focus Groups

A **mixed methods** research design is a procedure for collecting, analyzing, and “mixing” both quantitative and qualitative research and methods in a single study to understand a research problem.

Pedagogical (quasi)experiment

A pedagogical quasi-experiment is a research method used in education to study the impact of educational interventions or strategies in real-world settings, typically classrooms. Unlike a true experiment, it lacks random assignment, using pre-existing groups, and compares outcomes before and after implementing the intervention.

This approach assesses the effectiveness of educational methods but can't establish causation as definitively as true experiments.

Evaluation (e.g., TIMSS, PISA).

Trends in International Mathematics and Science Study (TIMSS) is conducted by the International Association for the Evaluation of Educational Achievement (IEA). It assesses the mathematics and science knowledge and skills of students in grades 4 and 8 in participating countries.

Programme for International Student Assessment (PISA) is conducted by the Organisation for Economic Co-operation and Development (OECD) and assesses the reading, mathematics, and science literacy of 15-year-old students in participating countries. PISA also includes an assessment of students' problem-solving abilities.

Action research

Characteristics

1. **Educational Focus**: Action education research is centered on addressing problems or challenges within educational settings, such as schools, classrooms, or educational programs.
2. **Collaboration:** Collaboration is a key feature, involving teachers, administrators, students, parents, and other stakeholders. They work together to identify, analyze, and solve educational problems.
3. **Practical Orientation:** It is aimed at improving teaching and learning practices, curriculum development, educational policies, or school management in a practical and context-specific manner.
4. **Cyclic Process:** Similar to general action research, action education research follows a cyclic process involving planning, acting, observing, and reflecting. The process is repeated until the desired improvements are achieved.
5. **Data-Driven:** Researchers collect data using various methods such as surveys, classroom observations, interviews, and assessments to inform their decision-making and measure the impact of interventions.
6. **Student-Centered:** Many action education research projects focus on enhancing student learning experiences and outcomes, making it student-centered in its orientation.

Phases of Action Education Research:

Action research

1. **Identification of Educational Problem:** The first phase involves identifying a specific issue or problem within an educational context. This could be related to student performance, teaching methods, curriculum design, classroom management, or any other aspect of education.
2. **Planning:** Researchers, often in collaboration with educators and stakeholders, create a plan for addressing the identified problem. This plan outlines the interventions, data collection methods, and the timeline for implementation.
3. **Action:** In this phase, the planned interventions are put into action. Teachers may adjust their teaching methods, curriculum designers may modify course materials, or administrators may implement changes in school policies.
4. **Observation and Data Collection:** Researchers collect data during and after the action phase to monitor the effects of the interventions. Data may include student performance, classroom behavior, survey responses, or any other relevant information.
5. **Reflection:** Data collected during the observation phase are analyzed, and researchers reflect on the outcomes. They consider whether the interventions had the desired impact, what worked well, and what might need further adjustment.
6. **Replanning and Iteration:** Based on the reflection and analysis, researchers may revise their plan and make further adjustments to the interventions. The cycle continues with repeated planning, action, observation, and reflection until the educational problem is adequately addressed.

Examples of Conducted Action Education Research

1. Improving Literacy Instruction: A group of teachers collaborates on an action education research project to enhance literacy instruction in a primary school. They experiment with various teaching strategies and assess their impact on students' reading comprehension and writing skills.

2. Inclusive Education: Educators work together to improve inclusion practices for students with disabilities in a mainstream classroom. They implement modifications in curriculum, teaching methods, and classroom arrangements to better support these students.

3.Assessment and Feedback: Teachers conduct action research to refine their assessment and feedback practices. They explore the effectiveness of different assessment methods, such as formative assessments and peer feedback, on student learning outcomes.

4. Professional Development: A school district initiates action research to enhance professional development programs for teachers. They assess the effectiveness of different training methods and materials, with the goal of improving teacher performance and student achievement.

5. Curriculum Development: Curriculum designers collaborate with teachers to revise and refine the curriculum for a specific subject or grade level. They gather feedback from teachers and students to make adjustments that align with learning objectives.

Examples of conducted research

Life Story in Education:

Educational Autobiography: A teacher's narrative of their own educational experiences, reflecting on how these experiences shape their teaching philosophy and practices.

Case Studies in Education

- **Inclusive Education Case Stud**y: Investigating the experiences and outcomes of students with disabilities in an inclusive classroom setting.
- **Technology Integration Case Stud**y: Analyzing how a specific school or teacher successfully integrated technology into their teaching methods and curriculum.
- L**anguage Acquisition Case Study**: Examining the language acquisition process of bilingual students in a particular school district.

Multiple School Case Studies in Education

- **STEM Education Program Evaluation**: Studying the effectiveness of STEM (Science, Technology, Engineering, and Mathematics) programs across several schools in improving students' interest and performance in these subjects.
- **School Choice and Student Achievement:** Comparing academic outcomes in schools with different forms of governance, such as public, charter, and private schools.

School Ethnography in Education

- Cultural Analysis of School Climate: Conducting ethnographic research to understand the cultural dynamics and social interactions within a school, which can influence student well-being and learning.

The steps of the scientific method

1. Selection and definition of a problem

A problem is a question of interest that can be tested or answered through the collection and analysis of data.

2. Execution of research procedures

The procedures reflect all the activities involved in collecting data related to the problem

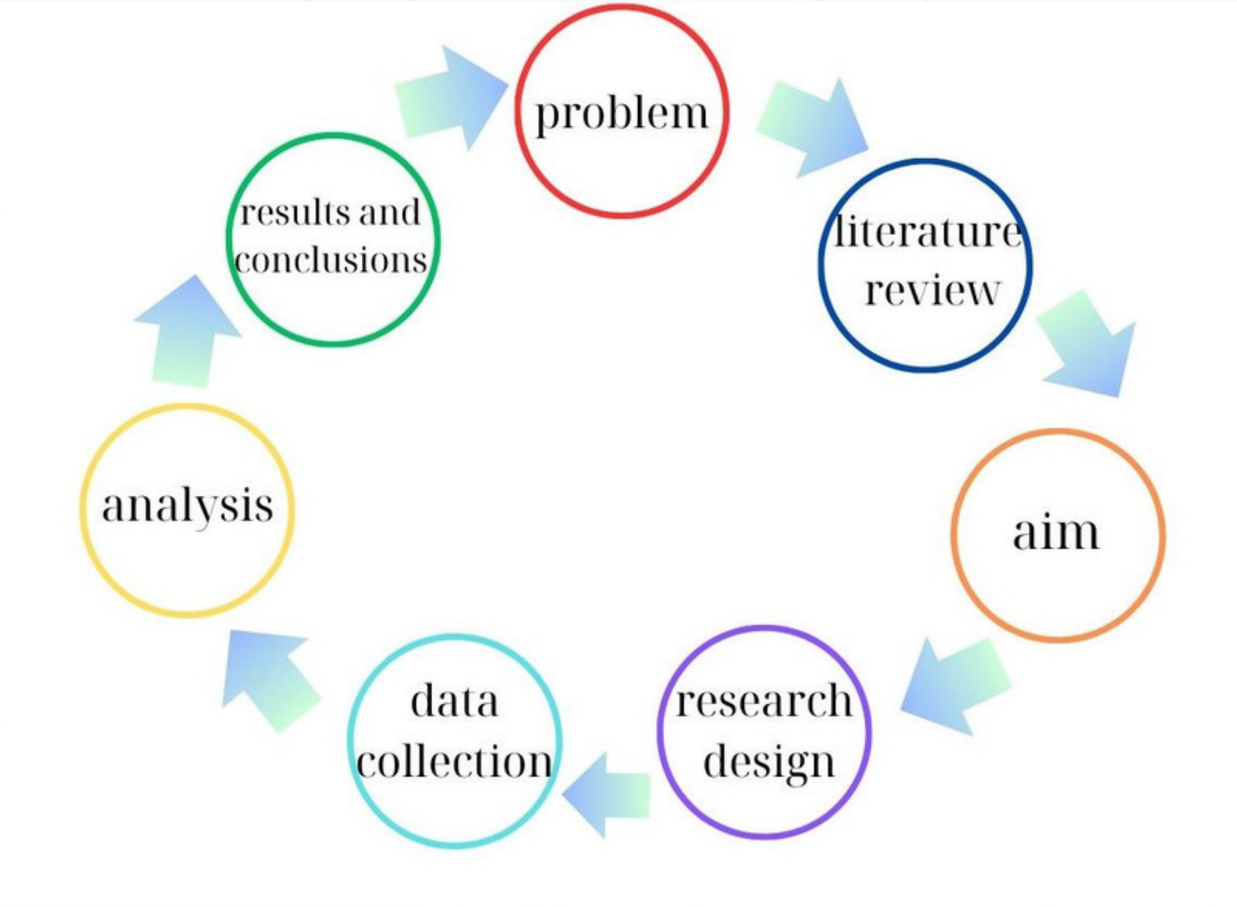
3. Analysis of data

Data are analyzed in a way that permits the researcher to test the research hypothesis or answer the research question.

4. Drawing and stating conclusions

The conclusions, which should advance our general knowledge of the topic in question, are based on the results of data analysis.

Research in social science disciplines



Procedure of scientific work

1. **Topic**, preliminary definition of the research problem
2. Systematic **literature search** on the topic
3. Formulation of **research objectives** and **research question**, operationalization of measured variables
4. Choice of **research design**
5. Choice of **data collection methods**, design/adaptation of data collection instrument, choice of data analysis methods
6. Choice of **sampling method** and sample size
7. **Piloting** the data collection instrument and research design
8. **Data collection**
9. Data processing, data transcription, **data analysis**
10. **Interpretation of results**, discussion of results, conclusions. Research report, bachelor thesis, technical paper, presentation

Examples:

Research topic: Teaching profession in contemporary society

Research questions:

- Characteristic elements of teaching as a profession
- Satisfaction with the profession among young teachers
- Public view of the teaching profession

Inappropriate research questions:

Do kindergarten teachers have enough experience to be able to diagnose a child's home problems?

The question can be changed:

What experience (or skills) do teachers have in diagnosing a child's home problems?

Aktivita:

try to formulate a **topic**, an **aim** and a **research question** on the chosen topic

Research topic review

- **Identify keywords in the topic**
- **use a scientific database of studies**
  - **WoS, SCOPUS, Proquest, ERIC**
  - **Katalog MU Aleph:** https://aleph.muni.cz/F?RN=738379108
  - **Katalog Moravské zemské knihovny (MZK):** https://www.mzk.cz/
  - **Katalog Národní knihovny ČR:** http://aleph.nkp.cz/F/?func=file&file_name=find-b&local_base=skc
  - **Google Scholar, Research Gate**

SCISPACE

My Library

Hi Oksana Stupak! Welcome back 👋

Search the largest scientific corpus in the world

Discover and study research papers better with SciSpace copilot

Get insights from top papers directly

Czech educational journals

- **Studia paedagogica:** http://www.phil.muni.cz/journals/studia-paedagogica
- **Orbis scholae:** http://www.orbisscholae.cz/
- **Pedagogika:** http://pages.pedf.cuni.cz/pedagogika/?lang=cs
- **Pedagogická orientace:** https://journals.muni.cz/pedor
- **Sociální pedagogika:** https://soced.cz/cs/uvod/
- **ue-Pedagogium:** uhttps://e-pedagogium.upol.cz/

Sample tables for a systematic search

- **Citace APA (American Psychological Association)**
https://is.muni.cz/do/sukb/kuk/materialy/cze/citace/pages/APA.html

Citation by APA	Pavelková, I. (2015). Pupil unmotivation. In Pedagogical research: reflecting on social needs and expectations? *Sborník příspěvků z 13. konference ČAPV* (s. 217-221). Olomouc: UP.
Aim of the research	Zmapovat četnost a závažnost základních příčin žákovské nemotivovanosti.
Research sample (size, type of sample)	236 teachers, 428 pupils (of whom 279 pupils from the eighth and ninth grades of primary schools and 149 students from third and fourth grades of eight-year grammar schools. Available sample.
Data collection methods, data analysis methods	A set of five possible reasons for pupil unmotivation was constructed. Both pupils and teachers rated on a five-point scale the frequency of occurrence and severity of a particular type of unmotivation in terms of its impact on learning success. Respondents were also given the opportunity to add other causes of unmotivation.
Research results	"...students consider the most common reason for being unmotivated to be that they are attracted to other activities. The second and third reasons were 'I am lazy', 'learning is tiring'. ...For the reason "I am lazy", there is a very interesting increase in the number of pupils in grammar schools and 9th graders. For the reason "I feel I am not up to it", t-tests showed a statistically highly significant higher frequency for primary school pupils. ...the most common reason for being unmotivated is also considered by teachers to be the attraction of other activities" (p. 218-219).
My notes	Důkladně zpracovaná teoretická východiska. Dobrá operacionalizace problému nemotivovanosti. Cíl výzkumu není v textu explicitně formulován. Slušný výzkumný vzorek. Jednoduchá, smysluplná statištika.

Task: for you **education reseach** describe the topic, propose, literature search, reseach quesion and design

reflection

Thanks for your attention