



Prifysgol Cymru
Y Drindod Dewi Sant
University of Wales
Trinity Saint David

ECDE 7012

Research Design and Management in Education

Session 2: 3rd February 2026

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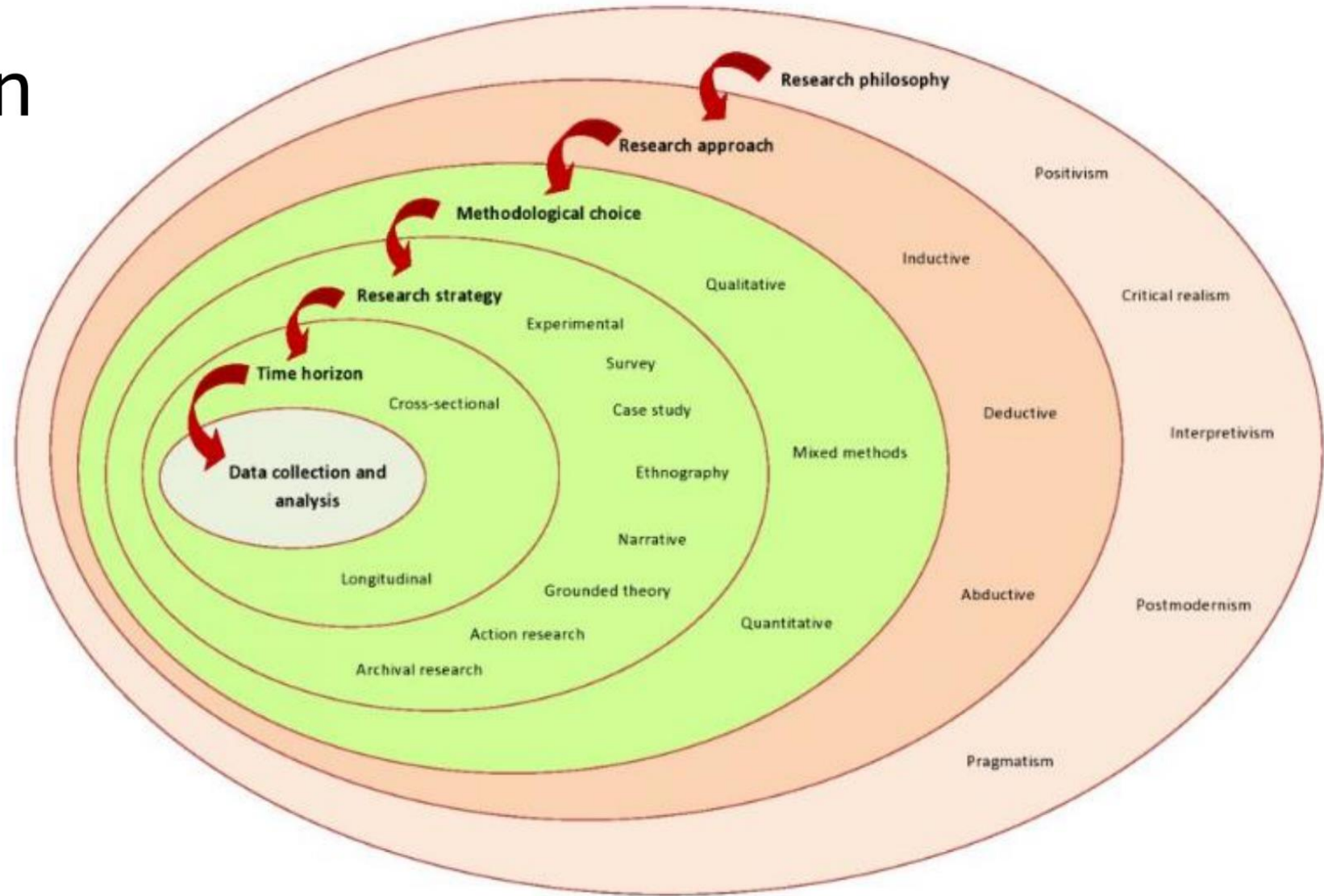
Trawsnewid Addysg, Trawsnewid Bywydau
Transforming Education, Transforming Lives

The Research Onion

Start from the outside and peel each layer away until you reach the core.

These layers are broken up into six main areas:

- research philosophy;
- research approach;
- research methodology choices;
- research strategy;
- time horizons;
- data collection techniques and analysis.



(Saunders et al., 2007)

Present your thinking around:



RESEARCH PROBLEM
STATEMENT



RESEARCH QUESTION



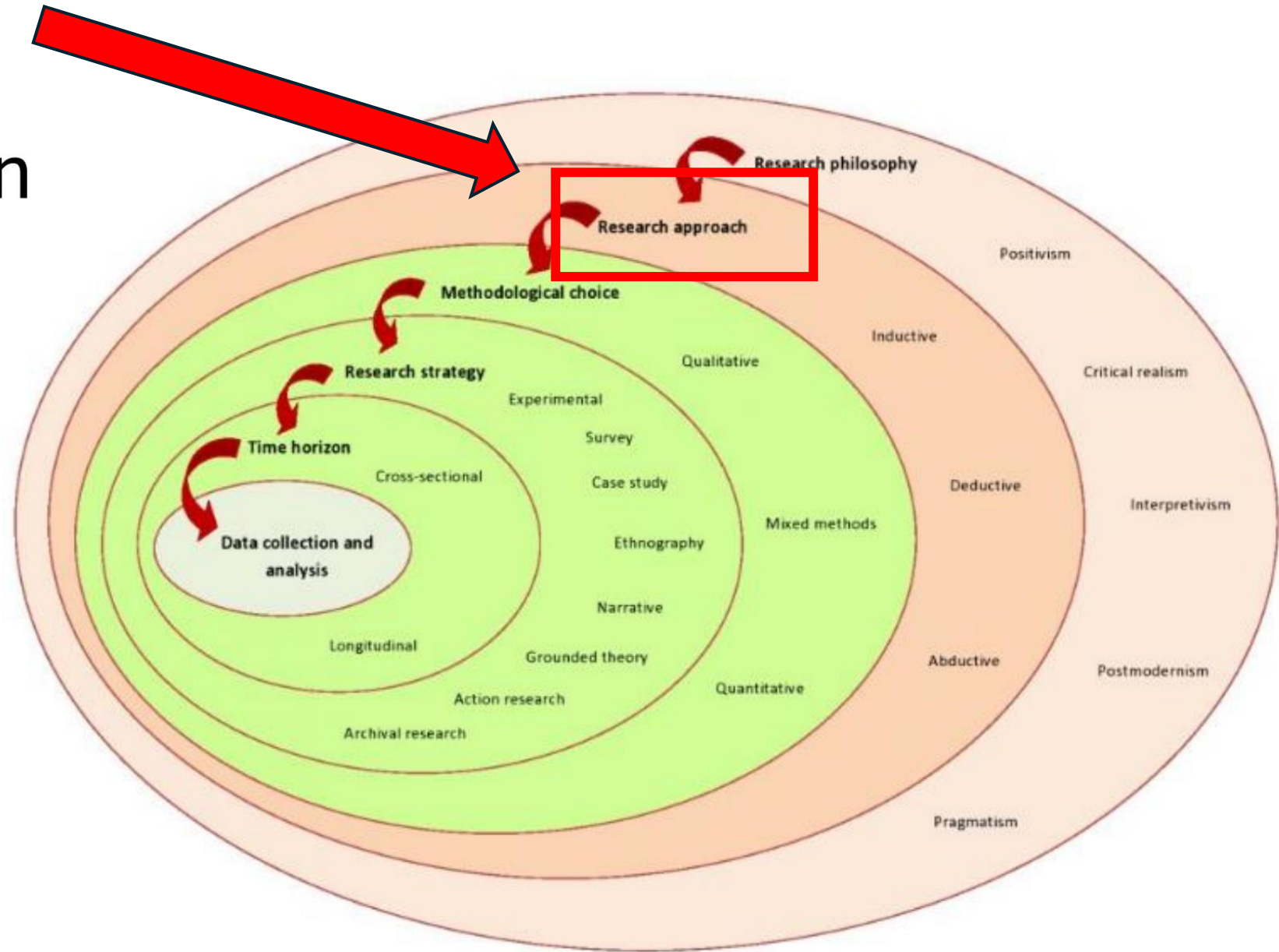
RESEARCH
WORLDVIEW

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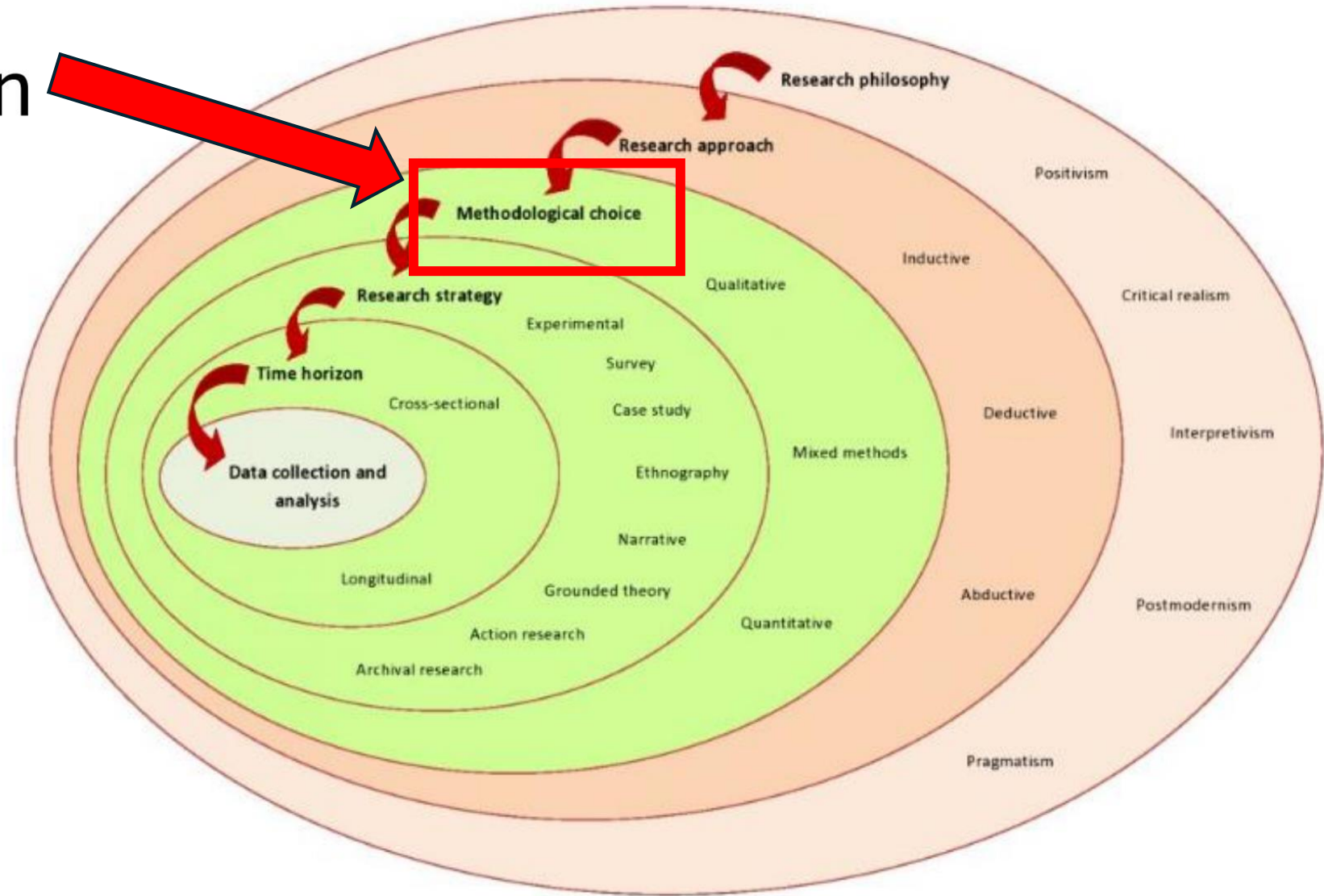
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Group task:



Share your knowledge and understanding around research approaches and methodological approaches (qual/quant/mixed methods)



Decide on which is most appropriate for your scenario



Include justification/rationale



Include relevant literature

Aspect	Inductive Approach 	Deductive Approach 	Abductive Approach 
Definition	Develops theories based on observations and patterns.	Tests existing theories through hypothesis-driven research.	Develops the most plausible explanation by inferring the best possible hypothesis.
Reasoning	Specific to general	General to specific	Incomplete observations to best explanation
Process	Observation → Pattern → Hypothesis → Theory	Theory → Hypothesis → Observation → Confirmation/Rejection	Observation → Explanation (best guess) → Theory Refinement
Objective	Discover new patterns or theories.	Test existing theories and validate hypotheses.	Find the most reasonable explanation for incomplete data.
Data Collection	Starts with data collection, then builds a theory.	Begins with an existing theory, then collects data to test it.	Uses incomplete or surprising observations and seeks the most likely explanation.
Common in	Qualitative research, exploratory studies	Quantitative research, confirmatory studies	Mixed-methods, problem-solving scenarios

Inductive Approach (exploratory and data driven)

Aspect	Inductive Approach
Definition:	Develops theories about the education system based on real-world observations and trends.
Reasoning:	Specific to general
Process:	Gather Data on Schools → Identify Patterns → Develop New Theories on Education Policy
Objective:	Discover new trends, challenges, or innovations in the education system.
Data Collection:	Starts with qualitative or quantitative data from schools, teachers, and students, then forms a theory.
Common in:	Policy research, educational reform studies, curriculum innovation.
Example:	A government agency observes that students in rural areas consistently underperform and develops a new theory about the impact of digital access on learning outcomes.

Deductive Approach (theory-driven and logical)

Aspect	Deductive Approach
Definition:	Tests existing educational policies, models, or frameworks using data-driven research.
Reasoning:	General to specific
Process:	Apply an Existing Education Theory → Form Hypothesis → Collect & Analyse Data → Confirm or Reject Hypothesis
Objective:	Test and validate existing educational policies or frameworks.
Data collection:	Uses existing educational theories and collects data to test predefined hypotheses.
Common in:	Large-scale educational assessments, standardised testing analysis, policy evaluation.
Example:	The Department of Education tests the hypothesis that reducing class sizes improves student performance, based on existing theories on personalised learning.

Abductive Approach (best guess and inference based)

Aspect	Abductive Approach
Definition	Infers the best explanation for unexpected educational trends or challenges.
Reasoning	Incomplete observations to best explanation
Process	Observe an Unusual Trend (e.g., declining literacy rates) → Identify Potential Causes → Test the Most Likely Explanation
Objective	Find the most reasonable explanation for unexpected educational issues.
Data collection:	Uses incomplete or surprising educational data to generate the most likely cause.
Common in:	Educational problem-solving, government and institutional decision-making.
Example:	A school district sees a sudden drop in student attendance and investigates multiple possible causes (e.g., transportation, socioeconomic factors, curriculum engagement) before identifying the most likely factor.

For next time...



Research your allocated
research strategy



Be prepared to share your
knowledge and understanding



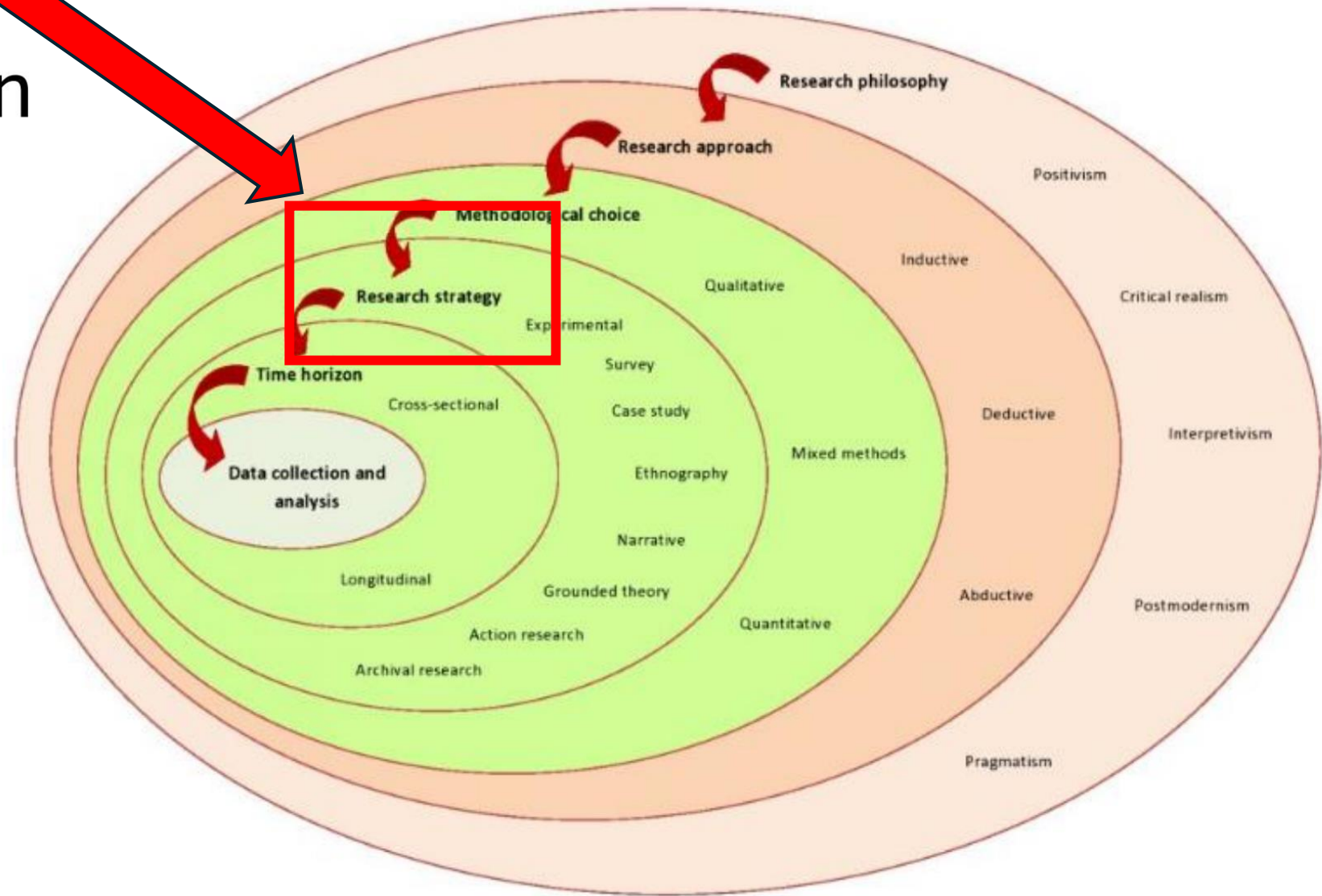
Refer to relevant literature

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Next session:

Tuesday 10th March 2026

5pm



