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Educational Research:

*How to set up experiments in your classroom and write a publication about it*

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### Agenda

- Scholarship of teaching
- Mixed methods Research design
- Selection and operationalization of variables
- Qualitative Research methods

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### Time table

Approximate Time	Topic
9.00	Opening and Introduction:
10.15	Presentation: Scholarship of Teaching and Classroom Research
11.00	Break
11.15	Assignment: Formulating research questions
12.30	Lunch break
14.00	Assignment: Applied research in higher education
14.30	Presentations: Design of a classroom experiment
15.30	Discussion: Publishing educational research
16.00	Conclusion

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### The relationship between teaching and research

The first doctor  
Thomas Aquinas  
Bologna, Italy,  
thirteenth century

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### Teaching and Research

- Teachers at a University are researchers in their own discipline
- Their conception of research methodology is determined by their own discipline
- Research on Teaching and Learning is related to social sciences like Psychology and Pedagogy
- In order to do this kind of research the methodological rules from these branches of science must be understood

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### Scholarship of Teaching

Ernest Boyer, 1990

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graph TD
    A[discovery] --- B[integration]
    B --- C[teaching]
    C --- D[application]
    D --- A
    E((Scholarship of Teaching))
  
```

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**In Germany**

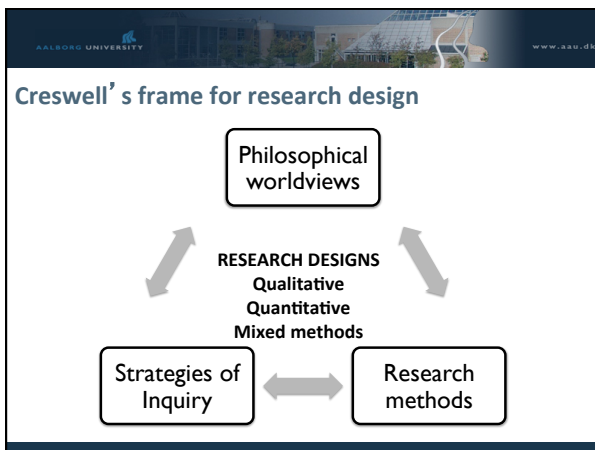
Hochschuldidaktik University of Stuttgart

<https://www.uni-stuttgart.de/hd/hochschuldidaktik/scholarship/index.html>

**Classroom research**

- Start with a research question
- Is there other research on this topic?
- What kind of data can you use to answer your question?

Comparatively small numbers, so qualitative or mixed-methods research is usually most appropriate



**Strategies of inquiry**

<b>Quantitative</b>	<b>Qualitative</b>	<b>Mixed methods</b>
<ul style="list-style-type: none"> <li>• Experimental design</li> <li>• Non-experimental designs               <ul style="list-style-type: none"> <li>• Questionnaires</li> <li>• Statistics</li> </ul> </li> </ul>	<ul style="list-style-type: none"> <li>• Discourse analysis</li> <li>• Ethnographic or naturalistic research</li> <li>• Phenomenography</li> <li>• Narratives</li> <li>• Case study</li> <li>• Action research</li> </ul>	<ul style="list-style-type: none"> <li>• Sequential</li> <li>• Concurrent</li> <li>• Transformative</li> </ul>

**Methods - examples**

Quantitative	Qualitative
Questionnaires	Interview
Test	Observation
	Document analysis
Interview	Questionnaires
Observation	Test
Document analysis	

**Research Design**

**Quantitative methods**

- Measurements aiming to confirm or reject hypothesis using statistics

**Qualitative methods**

- Descriptions of unique events or scales reflecting subjective impressions

**Mixed methods**

- The best of both worlds, but beware of... mixed up methods

**Phases in a research project**

Phase	Activity
1. Problem definition	research question & hypothesis
2. Research design	definition of the variables
3. Instrumentalisation	choice of instruments
4. Data gathering	experiment, fieldwork
5. Data processing	analysis
6. Interpretation	evaluation & report

**Qualitative Research methodologies**

Overview composed by Ron Ulseth, based on Case and Light (2011) and Crotty (1988), including all of the methods listed in the Sage Encyclopedia of Social Science Research Methods (Sandelowski, 2004).

**Qualitative Research methodologies**

Methodology	Description
Grounded theory	Data from the research study is used to establish new theory through identifying patterns and processes. Can be used to challenge preconceptions and allows for new developments.
Ethnography	Characterization of people and cultures through close observation, often through immersion in the culture. Data collected through observations, structured interviews, unstructured conversations, etc.
Action research	Dual focus on doing research while continuously improving the practice being studied. Defined by collaboration and community involvement.

**Qualitative Research methodologies**

Methodology	Description
Phenomenography	Characterization of the different ways in which people experience or think about a phenomenon. Outcomes include the distinct categories of the differing experiences.
Case study	Analysis of a single case of a phenomenon. Includes connecting that case to the specific, unique circumstances in which the case is set.
Discourse analysis	Analysis of the language used in the wide variety of communications (verbal, written, graphic, numeric) between people.
Narrative analysis	Study of how people make sense of a phenomenon by analysing the stories or narratives they use to describe it.

**Qualitative Research methodologies**

Methodology	Description
Phenomenological research	Study of how people experience a phenomenon without evaluating the experience or explaining why it happens. Contrasts with phenomenography in that phenomenography seeks differences between individuals.
Heuristic inquiry	Study in phenomenological approach that looks specifically at the individual experience of the researcher.
Design-based research	A methodology that integrates the dual purpose of design of new educational methods with research on the implementation. Mixed methods are often used in data collection.

**Any questions left unanswered ????**

