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Research Design in Qualitative and Case Research

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The Relationship Between Cell Phone Use and Academic Performance in a Sample of U.S. College Students

Andrew Lepp, Jacob E. Barkley, Aryn C. Karpinski
DOI: 10.1177/15244015573189 Published 19 February 2015

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Abstract

The cell phone is ever-present on college campuses and is frequently used in settings where learning occurs. This study assessed the relationship between cell phone use and actual college grade point average (GPA) after controlling for known predictors. As such, 536 undergraduate students from 82 self-reported majors at a large, public university were sampled. A hierarchical regression ($R^2 = .445$) demonstrated that cell phone use was significantly ($p < .001$) and negatively ($\beta = -.164$) related to actual college GPA after controlling for demographic variables, self-efficacy for self-regulated learning, self-efficacy for academic achievement, and actual high school GPA, which were all significant predictors ($p < .05$). Thus, after controlling for other established predictors, increased cell phone use was associated with decreased academic performance. Although more research is needed to identify the underlying mechanisms, findings suggest a need to sensitize students and educators about the potential academic risks associated with cell phone use.

“Increased cell phone use was associated with decreased academic performance”

Cell phones are an integral part of college life and culture. Even a casual observation of today's college students will reveal cell phones being used, both overtly and covertly, in every possible

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The Toulmin framework describes the scientific answer.

*Research design is about
planning a study that generates
such answers.*

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Science

= follows a
method(odology)

**Systematic activity that seeks
knowledge and
understanding about nature,
human being and society**

- *Industrial engineering and management can be seen as **mixture** of social and applied sciences.*

- **Scientific research aims to:**

- Increase **understanding** of different phenomena
- **Describe** different phenomena (Facts: WHAT, HOW)
- **Explain** and **interpret** different phenomena (e.g. WHY phenomena are (are not) interrelated, WHY causality exists between variables)
- **Predict** nature, human being and society
- **Apply** scientifically produced knowledge (e.g. in decision making)

Science: scientia (lat.): knowledge, "state of knowing"

Did you know...

...that about **70%** of DIEM students use qualitative methods in their master's theses

...that about **33 %** of HUT students use qualitative methods in their master's theses

- Primary data collected by qualitative surveys and interviews (and sometimes by observations)
- Secondary data including e.g. company documents

Source: Sipponen J. (2005) DIPLOMITYÖN MUOTOKUVA: SELVITYS TEKILLISEN KORKEAKOULUN V. 2005 DIPLOMITÖIDEN METODOLOGIASTA

What is qualitative research?

- **Cross-sectional, longitudinal or case research based on (mostly) qualitative data**
→ what it is, more specifically, depends on the **research design** and the chosen **philosophical positionings and methodological approach***

*i.e., the research *paradigm*





What is case research?

- Research based on a single case or multiple case design using any kind of data providing evidence of a limited number of studied objects/subjects (i.e. cases) → what it is, more specifically, depends on the **research paradigm, research design, data, chosen unit of analysis, time horizon, and methods**



Single-case study
in-depth



comparative
Multi-case study

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Not all qualitative research is case based.

Qualitative survey



Not all case research is qualitative.

Quantitative case



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Examples of qualitative research questions /topics /problems

“Why and under what circumstances are embedded elites enabled and motivated to act as institutional entrepreneurs in highly institutionalized contexts?”

Greenwood, R., & Suddaby, R.. (2006). Institutional Entrepreneurship in Mature Fields: The Big Five Accounting Firms. *The Academy of Management Journal*, 49(1), 27–48. <http://doi.org/10.2307/20159744>

“How do executives create high- (versus low-) performing cross-business-unit collaborations in multibusiness organizations?”

Martin, J. A., & Eisenhardt, K. M.. (2010). Rewiring: Cross-Business-Unit Collaborations in Multibusiness Organizations. *The Academy of Management Journal*, 53(2), 265–301. Retrieved from <http://www.jstor.org/stable/25684321>

“This article describes the **attributes** and **functions** of a **set of ceremonies** that we observed in an investigation of **dying organizations**.”

Harris, S. G., & Sutton, R. I.. (1986). Functions of Parting Ceremonies in Dying Organizations. *The Academy of Management Journal*, 29(1), 5–30. Retrieved from <http://www.jstor.org/stable/255857>

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What qualitative / case research is NOT:

“Find a problem, gather some interviews and documents, and figure out the solution...”

=not research.



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Paradigms

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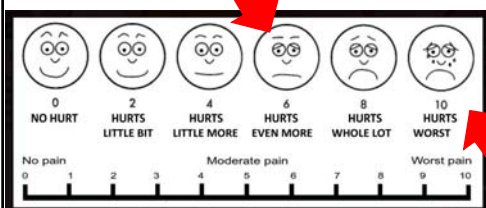
To grasp qualitative-, case- or **any** research in general, we need to understand three things:
1) what are paradigms,
2) what are research designs, and
3) how paradigms influence research designs.

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This will be painful, so why do you need to understand this?



1. Different fields of inquiry follow different paradigms – what works with your interests?
2. Methodological manuals will be highly different based on their paradigmatic background – can you recognize what you read?
3. Goals of research can be very different – to verify, predict, design, criticize existing order?
4. Research deliverables will be very different too – what style should you follow as you report your research?
5. Concepts like validity and reliability have different meanings depending on the paradigm – which criteria should you follow?

= to avoid greater confusion

Wong-Baker FACES rating scale (Wong et al., 2001, Wong's essential of pediatric nursing, Mosby: St. Louis, p. 1301)



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Research design choices are governed by the research paradigm

definition:

"a basic belief system or worldview that guides the investigator, not only choices in method but in ontologically and epistemologically fundamental ways."

Guba, E. S., & Lincoln, Y. S. (1994). Competing paradigms in qualitative research. In N. K. Denzin & Y. S. Lincoln (Eds.), *Handbook of qualitative research* (pp. 105-117). Thousand Oaks, Ca: Sage, p.105

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“**Ontology** is a branch of philosophy that is concerned with the nature of what exists. It is the study of theories of being, theories about what makes up reality.”

material reality vs. social reality

Blaikie, N. (2004). Ontology, Ontological. In M. S. Lewis-Beck, A. Bryman, & T. F. Liao (Eds.), *The SAGE Encyclopedia of Social Science Research Methods*. (p. 768). Thousand Oaks, CA: Sage Publications, Inc.

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Basically, as I put it, **ontology is concerned about the question of reality in the sense of “**what, in truth, exists**”... the difference between something that “*really exists*” vs. “*is considered to exist*”.**

Source: Dr. Brax

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knowing & acquiring knowledge

Epistemology: “Theory of knowledge, a theory of how human beings come to have knowledge of the world around them—of how we know what we know. . . .provides a philosophical grounding for establishing what kinds of knowledge are possible and for deciding how knowledge can be judged as being both adequate and legitimate. In the social sciences, the term is used in the context of deciding which scientific procedures produce reliable social scientific knowledge.”

Blaikie, N. (2004). Epistemology. In M. S. Lewis-Beck, A. Bryman, & T. F. Liao (Eds.), *The SAGE Encyclopedia of Social Science Research Methods*. (pp. 310-311). Thousand Oaks, CA: Sage Publications, Inc. doi: <http://dx.doi.org/10.4135/9781412950589.n281>



Basically, as I put it, epistemology is concerned about the question of reality in the sense of “how do we know what, in truth, exists”... how do we know the difference between something that “know that exists” vs. “consider to exist”.

Source: Dr. Brax

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Our ontological epistemological conceptions influence our considerations about which research methods are appropriate.

*What can we study?
How can we obtain information about it?
How can we verify our discovery?*

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		ONTOLOGY	
		Materialism	Idealism
EPISTEMOLOGY	Nominalism	<p>Empiricism: “reality is viewed as being constituted of material things that can be observed by the use of the human senses. Concepts and generalizations are shorthand summaries based on many observations.”</p> <ul style="list-style-type: none"> • Positivism • Falsificationism 	<p>Subjectivism: “rejects the notion of a material world and views reality as being socially constructed and interpreted, knowledge of this reality is available only from the accounts that social actors can give of it.”</p> <ul style="list-style-type: none"> • Interpretivism
	Realism	<p>Substantialism: “adopts a materialist view of reality but accepts that people in different times and places can interpret reality differently. Nevertheless, the material world is seen to constrain human actions and social relations.”</p> <ul style="list-style-type: none"> • Critical Realism 	<p>Rationalism: “views reality as both real and general; it exists independently of people, their consciousness, and their circumstances. Because this reality is made up of ideas, knowledge of it can be obtained only by examining thought process, the innate ideas shared by human beings—in short, the structure of mind itself”</p> <ul style="list-style-type: none"> • Uncommon in social sciences



Blaikie, N. (2004). Epistemology. In M. S. Lewis-Beck, A. Bryman, & T. F. Liao (Eds.), *The SAGE Encyclopedia of Social Science Research Methods*. (pp. 310-311). Thousand Oaks, CA: Sage Publications, Inc. doi: <http://dx.doi.org/10.4135/9781412950589.n281>, partially based on Johnson, T., Dandeker, C., & Ashworth, C. (1984). *The structure of social theory*. London: Macmillan.

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Positivism

- A set of philosophical ideas/claims guiding research:
 1. “a **distrust of abstraction**”
 2. “a preference for **observation unencumbered by too much theory**”
 3. “a commitment to the idea of a **social science that is not vastly different from natural science**”
 4. “a profound respect for **quantification**” (Paley 2008, 3; *inc. mat.*)
- Closely related and overlapping with empiricism
 - *Natural science as the ideal model for social sciences*
→ ‘naturalistic’ inquiry in qualitative research
 - *Very vulnerable to critique and difficult to accept in its entirety, yet cherished by academics in our research fields*
 - *“neopositivism” – see quantitative research in North-American toptier journals*

Interpretivism / constructivism

- Denies "the existence of an external objective reality independent of an individual from which knowledge may be collected or gained" (Constantino 2008, 3; **included material**)
- Knowledge is constructed by each individual based on her/his experience – through social interaction
 - **Explaining phenomena** (natural sciences)
 - **understanding phenomena** (social sciences)
 - *interpretive turn*
- **Critique: not scientific, not generalizable, soft, etc.**

e.g. Weick & organizational sensemaking theory

- Weick, K. E., Sutcliffe, K. M., & Obstfeld, D. (2005). Organizing and the Process of Sensemaking. *Organization Science*, 16(4), 409-421.



Constantino, T. E. (2008). Constructivism. In L. M. Given (Ed.), *The Sage Encyclopedia of Qualitative Research Methods* (pp. 116-121). Thousand Oaks, CA: SAGE Publications, Inc.

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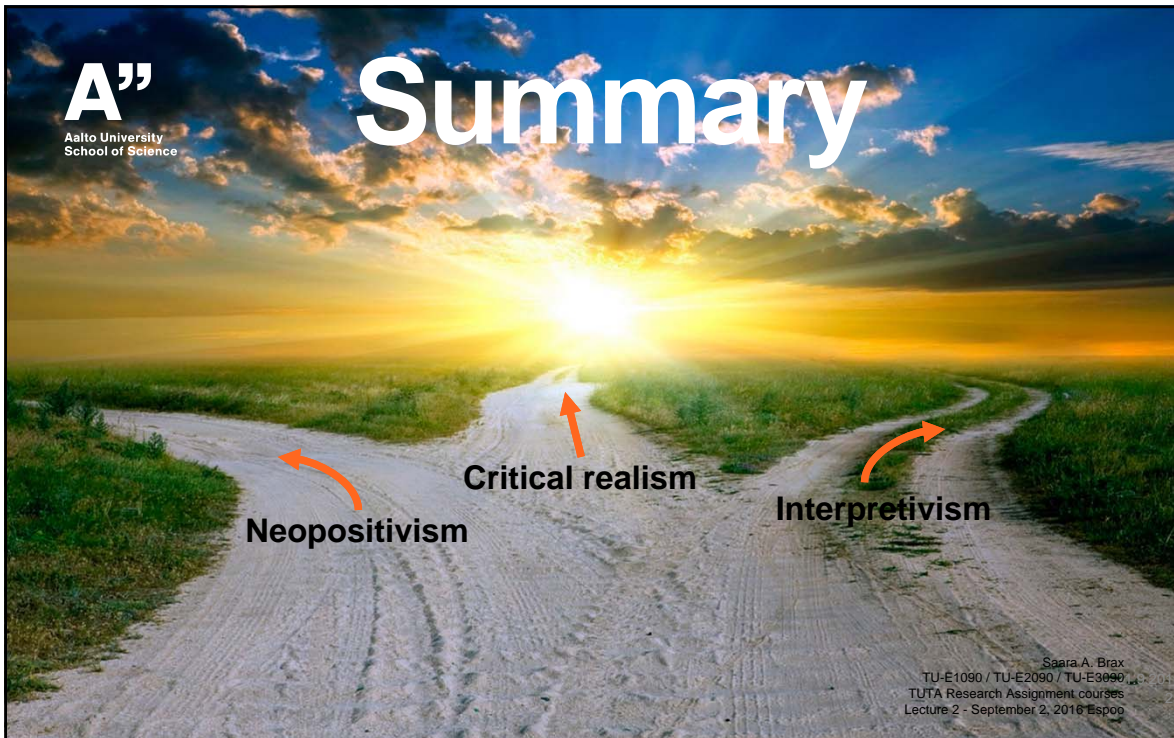
Critical realism

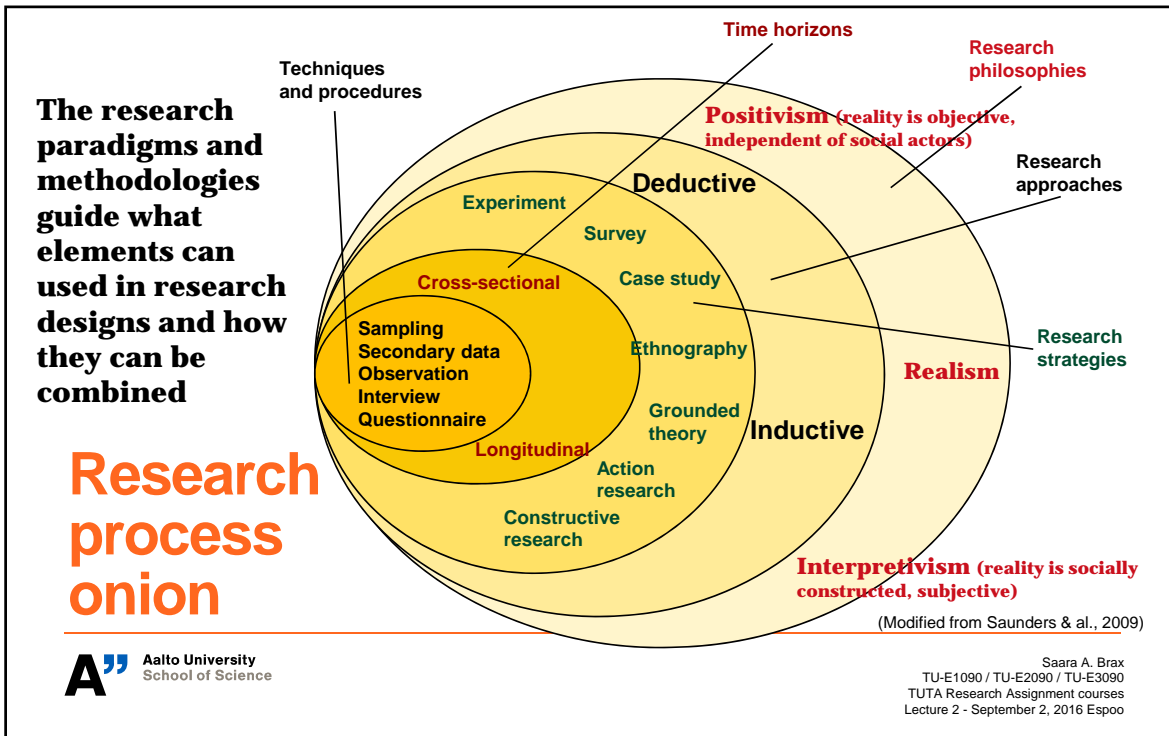
- "Critical realism offers an ontology that can conceptualize reality, support theorizing, and guide empirical work in the natural and human sciences" (Clark 2008, 3; **inc. mat.**)
 - **Reality viewed as complex** (Bhaskar's three realms of reality)
 - **Both structural aspects and agency recognized as influencing human behavior and social systems**
- **Can be used with quantitative and qualitative methods – or mixed methods; hypothetico-deductive, explorative, experimental, interpretive, inductive designs**
- **Stems from the critique against positivism and constructionism**
- **→ a defensible and sustainable view**
- *Links with complexity theory, social emergence, and systems theory*



Clark, A. M. (2008). Critical Realism. In L. M. Given (Ed.), *The Sage Encyclopedia of Qualitative Research Methods* (pp. 168-171). Thousand Oaks, CA: Sage.

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So, let's talk about research design!

Research design

- The "preliminary strategy or outline... that consist of a clear statement of the **research question** as well as **plans for gathering, processing and interpreting the observations** intended to answer the question. To formulate a research design is to **anticipate the entire research process, from beginning to end.**" (Singleton & Straits, 2010, 108)
- The **logic that links the data** to be collected and the **conclusions** to be drawn to the initial **questions** of a study (modified from Yin, 1994)
- **Every empirical study has an implicit, if not explicit, research design**
- **Note:** In research methods literature and in discussions terms such "research design", "research approach", "research strategy" often mean the same or almost same

Elements of research design

Research design is the configuration of the designed characteristics and decisions made on research problem formulation, theory selection and use, method to collect and analyze data, and the data itself.

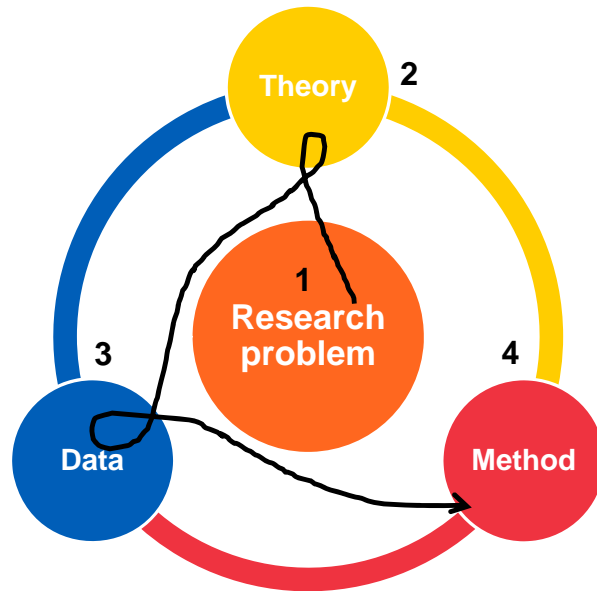
- Different archetypical configurations represent alternative research traditions and tend to have different traditions and norms concerning reporting of the findings.



Deductive reasoning

1. Research problem/focus
2. Inspect theory and generate hypothesis
3. Sample and gather data
4. Process data and support or reject theory

- Problem is tightly defined
- Results are focused

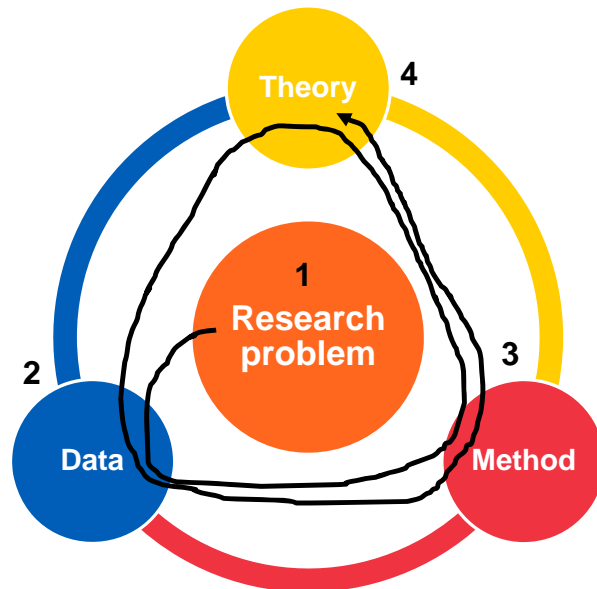


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Inductive reasoning

1. Research problem
2. Sample and gather data
3. Process data
4. Generate theory

- Problem is loosely defined, as findings may re-define the problem
- Thus can be iterative



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Typical features of qualitative research

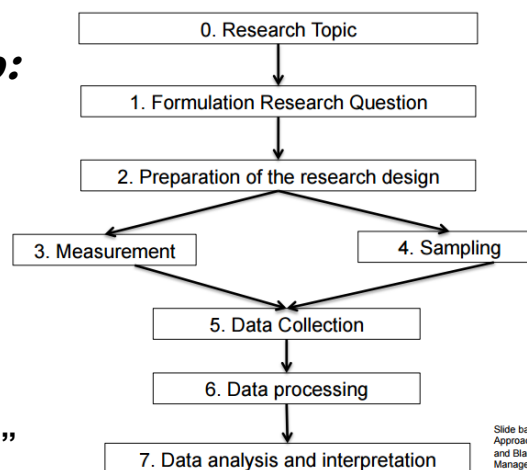
- **Purposive samples** instead of representative or random samples (Stat Rep is not aim – but **still must reduce any bias**)
- **The phases of research process (data collection, data analysis) are fundamentally interconnected > evolve/change**
- **Usually no hypotheses**
 - Better to have no hypotheses because they may limit researcher's *perception* and *misguide* data selection
- **Analysis is often based on *data* instead of theory**
- **The approach is often *inductive***
- **The role of researcher is active and participative**
- **The objectivity in qualitative research is *acknowledging* that the researcher is the subject (e.g. be aware of own bias)**

Research Process

Lecture 1 recap:

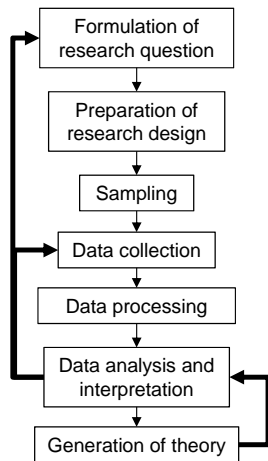
**Generic
research
process for
quantitative
survey
research**

Remove "measurement"
Add "generation of theory"

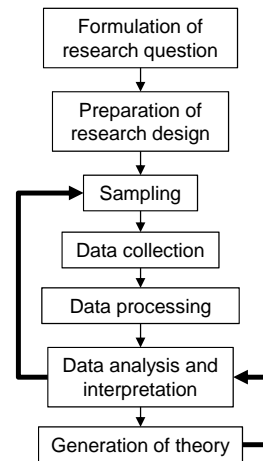


Comparison of research processes

QUALITATIVE RESEARCH PROCESS



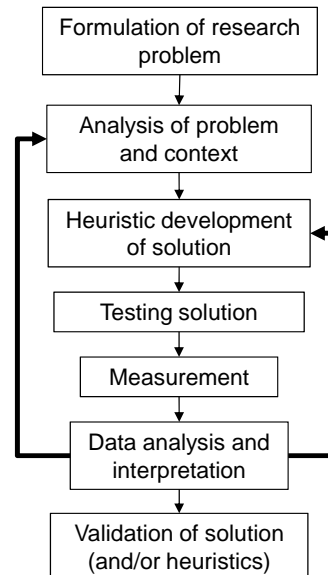
CASE RESEARCH PROCESS




CONSTRUCTIVE RESEARCH PROCESS / DESIGN SCIENCE

NOTE:

- Given a topic by a company, and working on it independently, engineering students typically identify it as a practical and company-specific problem and produce a solution on it
- The above is typically implementation of techniques, not research



	Type of Selection	Purpose	
 <p data-bbox="245 457 428 646">Strategies for the selection of samples and cases</p> <p data-bbox="245 674 428 905">Flyvbjerg, B. (2006). Five Misunderstandings About Case-Study Research. <i>Qualitative Inquiry</i>, 12(2), 219-245.</p>	A. Random selection	To avoid systematic biases in the sample. The sample's size is decisive for generalization.	
	1. Random sample	To achieve a representative sample that allows for generalization for the entire population.	
	2. Stratified sample	To generalize for specially selected subgroups within the population.	
	B. Information-oriented selection	To maximize the utility of information from small samples and single cases. Cases are selected on the basis of expectations about their information content.	
	1. Extreme/deviant cases	To obtain information on unusual cases, which can be especially problematic or especially good in a more closely defined sense.	
	2. Maximum variation cases	To obtain information about the significance of various circumstances for case process and outcome (e.g., three to four cases that are very different on one dimension: size, form of organization, location, budget).	
	3. Critical cases	To achieve information that permits logical deductions of the type, "If this is (not) valid for this case, then it applies to all (no) cases."	
	4. Paradigmatic cases	To develop a metaphor or establish a school for the domain that the case concerns.	



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Discussion

1. What sampling strategy options do you have if you have access to only one case?

What sampling strategy options do you have if you have access to only one case?



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Strategies for the selection of samples and cases

Flyvbjerg, B. (2006). Five Misunderstandings About Case-Study Research. *Qualitative Inquiry*, 12(2), 219-245.

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Discussion

2. You are doing your Master's thesis for one company... what are your sampling options for a case study?

(This is a trick question! You need to think about the research design beyond sampling.)

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You are doing your Master's thesis for one company... what are your sampling options for a case study?



Strategies for the selection of samples and cases

Flyvbjerg, B. (2006). Five Misunderstandings About Case-Study Research. *Qualitative Inquiry*, 12(2), 219-245.

- | | |
|-----------------------------------|--|
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Validity, reliability and trustworthiness in qualitative research

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EVALUATING QUALITATIVE RESEARCH - Reliability and validity

- The concepts of validity and reliability are somewhat difficult to apply in evaluation of credibility of qualitative research.
- **Reliability** = extent to which your data collection techniques or analysis procedures will yield consistent findings:
 - When analyzed by someone else
 - When analyzed at a different time
 - Is the process of making sense from the raw data transparent?
 - Conflict free interpretation
- **Validity** = are findings really about what they appear to be about and/or does the data collection method measure what it is intended to measure?
 - Internal validity: concordance between philosophical background, theory, concepts and methods
 - External validity: relationship between data and interpretations

Traditional criteria...

- ” **1 Truth value:** How can one establish confidence in the ‘truth’ of the findings of a particular inquiry for the subjects (respondents) with which and the context in which the inquiry was carried out?
- 2 Applicability:** How can one determine the extent to which the findings of a particular inquiry have applicability in other contexts or with other subjects (respondents)?
- 3 Consistency:** How can one determine whether the findings of an inquiry would be repeated if the inquiry were replicated with the same (or similar) subjects (respondents) in the same (or similar) context?
- 4 Neutrality:** How can one establish the degree to which the findings of an inquiry are determined by the subjects (respondents) and conditions of the inquiry and not by the biases, motivations, interests, or perspectives of the inquirer? (Lincoln and Guba, 1985: 290) ”

Revised criteria to evaluate the trustworthiness of qualitative content analysis (Lincoln & Guba 1985)

Trustworthiness: Does the analysis support the argument that the findings are relevant or worthy of attention?

1) Credibility

- “those participating in research are identified and described accurately.”

2) Dependability

- “the stability of data over time and under different conditions.”

3) Conformability

- “objectivity, that is, the potential for congruence between two or more independent people about the data’s accuracy, relevance, or meaning.”

4) Transferability

- “the potential for extrapolation.”
- “relies on the reasoning that findings can be generalized or transferred to other settings or groups.”



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Elo, S., Kääriäinen, M., Kanste, O., Pölkki, T., Utriainen, K., & Kyngäs, H. (2014). Qualitative Content Analysis. *SAGE Open*, 4(1). (page 2)

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Transparency

A common feature of the criteria to assess the quality of qualitative research is the requirement for transparency by accurate and detailed reporting of the process of content analysis

- analytical steps
- procedural principles of analysis
- samples of original data



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TUTA Research Assignment courses
Lecture 2 - September 2, 2016 Espoo

From research design to research plan

Research plan / proposal

- Working plan for the researcher
 - What I am going to do
 - Scientific goals, (Practical goals)
 - What I need to do
 - Scientific goals
 - (Practical goals)
 - Tool for discussions with the advisor / other interest groups
 - Mean for applying research funding
- Most of the text of the research plan can be used in the research report

Typical problems in research plans

- Typical problems in previous years' research plans include:
 - Research is not focused enough
 - Research questions are too complex or too simple
 - Data does not help at reaching the objectives or answering the research questions
 - Key concepts are not defined or they are defined inaccurately
 - Data:
 - Not described clearly enough
 - Not stated why the particular data set was chosen
 - Not described clearly enough how data will be collected
 - Not enough data
 - Population and sample are not described or defined
 - Data collecting methods (e.g. survey) does not provide accurate data
 - Data collecting instruments (e.g. survey, or interview skeleton are not included into research plan)
 - Reader does not understand how the research will be carried out

Discussion

"A company wants you to study agility in its offering development teams. There is a lot of variance in how quickly the 20+ teams finish relatively similar projects and they ask you to identify the best practices to make the laggards really agile. You have access to all teams and unlimited resources. How do you translate this wish into an inductive case research design? Which sampling strategy would you choose and how would you implement it? Also explain briefly what kind of data you would obtain and describe your approach to analyze it."