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UniverCity Action Lab

Module 2: Research methods



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Module 2: Qualitative and Quantitative Techniques of Systematically Gathering and Analysing Data

The aim of this module is to equip students with the research project management methods and techniques for implementing their team projects. Well-planned and conducted research can provide insight into the real-life practices and needs of individuals and communities that these projects concern.

Upon completion of this module students will be able to:

- ✓ Choose the right research methods for the specific research questions related to urban challenges
- ✓ Design an interdisciplinary research plan
- ✓ Communicate research results in (an interdisciplinary) team
- ✓ Gain practical experience in using different research methods in an urban context
- ✓ Give feedback to peers
- ✓ Manage research projects
- ✓ Analyse, synthesise, and critically evaluate information



1. Framing Interdisciplinary Research Objectives

- Different research methods
- Qualitative and quantitative research techniques
- Guidelines in research ethics

2. Research Project Design and Management

- Relevance and potential of interdisciplinary research
- Guidelines for conducting research in a team
- Characteristics of good research

3. Data Analysis and Impact Assessment

- Interpret and analyse your data
- Role of the researcher in the research process



1. Framing Interdisciplinary Research Objectives



Different research methods



Qualitative and quantitative research techniques



Guidelines in research ethics



Research methods

“In much of society, research means to investigate something you do not know or understand.”
Neil Armstrong

Different research methods are appropriate for different studies.

Students need to decide what data they are collecting before deciding on the method.

Is it qualitative or quantitative data collection?

- Subjective or objective
- Case-specific or generalisable
- *In very simple terms:* words or numbers

Primary and secondary data collection:

- Using your own data or someone else's

Thinking points:

1. Sometimes what you may perceive as a problem is not considered a problem by others. How do you make sure your research is relevant and needed?



Research methods

Qualitative and quantitative data collection employ different methods.

Qualitative research methods may be:

- Interview/focus groups

Quantitative research methods may be:

- Surveys
- Experiments

Some methods collect both types of data:

- Observations
- Literature reviews
- Case studies



Thinking points:

1. What are some pros and cons of the different types of data collection?

Qualitative and quantitative research techniques



Method/technique	Used to determine
Qualitative	--
Interview/focus groups	in-depth understanding of a topic
Quantitative	--
Experiment	cause-and-effect
Survey	characteristics of a population
Both	--
Observation	how something occurs naturally
Literature review	Find trends, put your research in context
Case study	In-depth understanding of a certain place, group or other context



Guidelines in research ethics

Research ethics are important in order to protect the dignity, rights and safety of participants and also maintain research quality.

Good ethical practices include:

- Objectivity
- Honesty
- Being within the law
- Protection of participants' sensitive data
- Accurate representations
- Obtain consent from participants (!)



Thinking points:

1. Can you think of any more good/bad practices in scientific research?



Activity

Individually, students may brainstorm some answers to the following:

1. For what kind of research (in the urban context) would each of these methods be appropriate?
2. What ethical issues are important to consider when researching in the urban context?
3. How do you ensure that the problem you are researching is also considered a problem by other stakeholders? i.e. it's not only considered a problem by you alone.

Case study

- [Delft South-East](#) – How urban challenges are being addressed using participatory research methods
- [Sustainable Welfare in Sweden](#) – Using local stakeholder committees for research



Key Resources – Framing Interdisciplinary Research Objectives

Readings

- Szostak, R. (2007). How and why to teach interdisciplinary research practice. *Journal of Research Practice*, 3(2), Article M17.
- Stokols, D. (2013). Training the next generation of transdisciplinary researchers. In: *Enhancing Communication and Collaboration in Interdisciplinary Research*. O'Rourke, M., Crowley, S., Eigenbrode, S.D., and Wulfhorst, J.D., Eds. Thousand Oaks, CA: SAGE Publication. Pp. 56–81.
- Carra, G., Loucksb, D. P., Blöschla, G. (2018). Gaining insight into interdisciplinary research and education programmes: A framework for evaluation. *Research Policy*, 47(1), 35–48.
- Knowlton, J. L., Halvorsen, K. E., Handler, R. M., and O'Rourke, M. (2014). Teaching Interdisciplinary Sustainability Science Teamwork Skills to Graduate Students Using In-Person and Web-Based Interactions. *Sustainability*, 6: 9428-9440.
- Scheel, E.D. (2002). Using Active Learning Projects to Teach Research Skills Throughout the Sociology Curriculum. *Sociological Practice*, 4(2), 145–170.
- Ladner, S. (2014). *Practical ethnography: A guide to doing ethnography in the private sector*. Walnut Creek: Left Coast Press
- [Types of scientific research](#)

Videos

- [Qualitative and Quantitative Research](#)
- [Quantitative vs. Qualitative Research: The Differences Explained](#)
- [Data Collection methods](#)



2. Research Project Design and Management



Relevance and potential of interdisciplinary research



Guidelines for conducting research in a team



Characteristics of good research



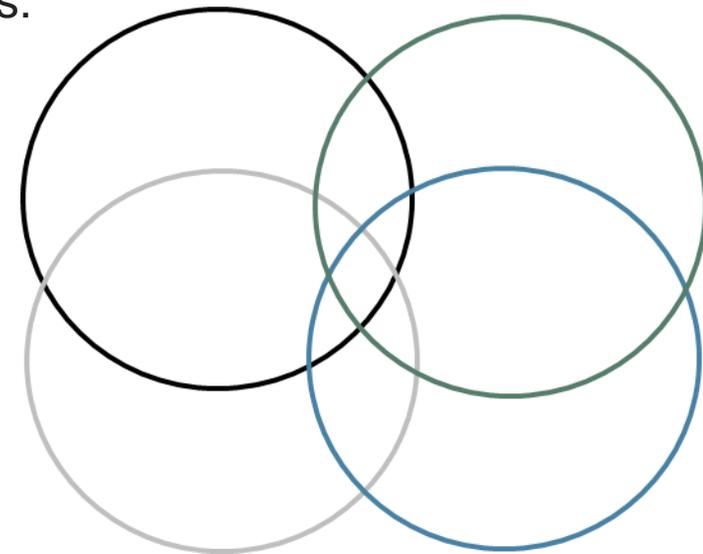
Relevance and potential of interdisciplinary research

Interdisciplinary research integrates data, techniques, viewpoints etc from two or more disciplines. It is relevant when addressing urban challenges.

Interdisciplinary viewpoint allows us to get a more in-depth, comprehensive understanding of what is happening.

These are just a few disciplines that overlap when considering urban challenges:

- Geography
- Human health
- Arts and culture
- Biology
- Sustainability
- Economics
- Psychology

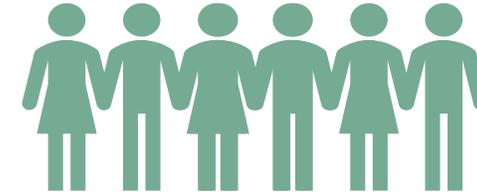


Guidelines for conducting research in a team

When teamwork is used effectively it can be a powerful tool.

Benefits of teamwork:

- Diverse viewpoints
- Mutual learning
- Division of labour
- Increased support



But to reap these benefits it's important to have:

- Defined goals and roles
- Fair task distribution
- Deadlines
- Regular communication
- Consensus on the plan and methods

Thinking points:

1. **What are the disadvantages of teamwork and how can we overcome these issues?**



Characteristics of good research

Good research gets published all the time, but what are the *characteristics* of this research?

- It answers a question/solves a problem
- Well-planned
- The methods for data collection are appropriate for the topic
- Has reliable data
- Is reproducible
- Follows ethical guidelines



Thinking points:

1. What are other characteristics that you can think of?

Activity

Using a ‘Problem-Reversal’ approach* find solutions to the following:

1. In your research team, how do you decide on efficient task distribution? i.e. who does what
2. What are some conflict resolution and avoidance strategies?

Case studies

- [Demola](#) – Teamwork and differing expertise to solve problems
- [DriveGreen](#) – Interdisciplinarity, combining anthropological approaches with mechanical engineering to address urban challenges

*A problem reversal asks how one could cause the problem i.e. “how can I ensure inefficient task distribution?” Use your reverse problem to find reverse solution ideas. Finally reverse your solutions so they fit the original question (ensuring efficient task distribution).



Key Resources – Research Project Design and Management

Readings

- [What constitutes good research?](#)
- [The advantages of doing research in teams](#)
- Tobi, H. and Kampen, J.K. (2018). Research design: the methodology for interdisciplinary research framework. *Quality & Quantity*, 52(3): 1209-1225.
- Brewer, G.D. (1999). The challenges of interdisciplinarity. *Policy Science*, 32, 327–337.
- Morse, W. C., M. Nielsen-Pincus, J. Force, and J. Wulfhorst. (2007). Bridges and barriers to developing and conducting interdisciplinary graduate-student team research. *Ecology and Society*, 12(2): 8.
- [Stakeholder engagement](#)

Videos

- [What is Interdisciplinary Research?](#) – an example
- [What is good research?](#)
- [Interdisciplinary Research: Definition, Process and Theory](#)



3. Data Analysis and Impact Assessment



Interpret and analyse your data



Role of the researcher in the research process



Interpret and analyse your data - Analysing Qualitative Data

Popular methods of qualitative data analysis when researching urban challenges

Content analysis:

- Looks for themes, words or concepts in texts and media
- i.e. responses from interviewees

Narrative analysis:

- used when there is content from a number of sources
- interprets stories and experiences to answer the research questions
- i.e. interviews of respondents, field observations, surveys

Discourse analysis:

- Tries to understand the meaning behind the language used
- analysing social context

Grounded theory:

- using qualitative data to explain a certain phenomenon
- studies similar cases in different settings



Interpret and analyse your data - Analysing Quantitative Data

Popular methods of qualitative data analysis

Descriptive Statistics allow us to summarise data and find patterns.

Examples are:

- Mean: average values
- Median: midpoint value of the dataset
- Mode: most frequently occurring value
- Percentage
- Frequency: how often a value occurs
- Range: highest and lowest values in the dataset

Statistics are only useful if one is able to interpret what they mean – what is the significance of statistical outcome?

Thinking points:

1. Are there different situations where different statistics would be appropriate?



Role of the researcher in the research process

What is the role of a researcher in all this?

Depending on the type of data that is being collected:

- extract and understand how participants feel about the topic
- reduce their own bias
- ensure they do not instil bias in their research participants when discussing/presenting the topic
- collection and analysis of data



Remember that these skills will be valuable in when undertaking group research in an attempt to tackle a specific urban challenge.

Thinking points:

1. What would different roles would a researcher need to play depending on the different



Activity

The questions can be discussed in small groups:

1. Come up with a research plan for a chosen urban challenge, it should have (among others):
 - Research question
 - Type of data to collected
 - Data collection method
 - Method of data analysis
 - Ethical considerations
 - Stakeholders involved
 - Experts to be consulted



Key Resources – Data Analysis and Impact Assessment

Readings

- Dey, I. (1993). Qualitative data analysis: A user-friendly guide for social scientists. London and New York: Routledge.
- [Qualitative data analysis](#) – simple introduction
- [Qualitative Data Analysis](#)
- [A Really Simple Guide to Quantitative Data Analysis](#)
- [Analysis of quantitative data](#)
- [A step-by-step guide to data collection](#)



Videos

- [The Data Analysis Process](#)
- [Analyzing and Interpreting Data](#)

