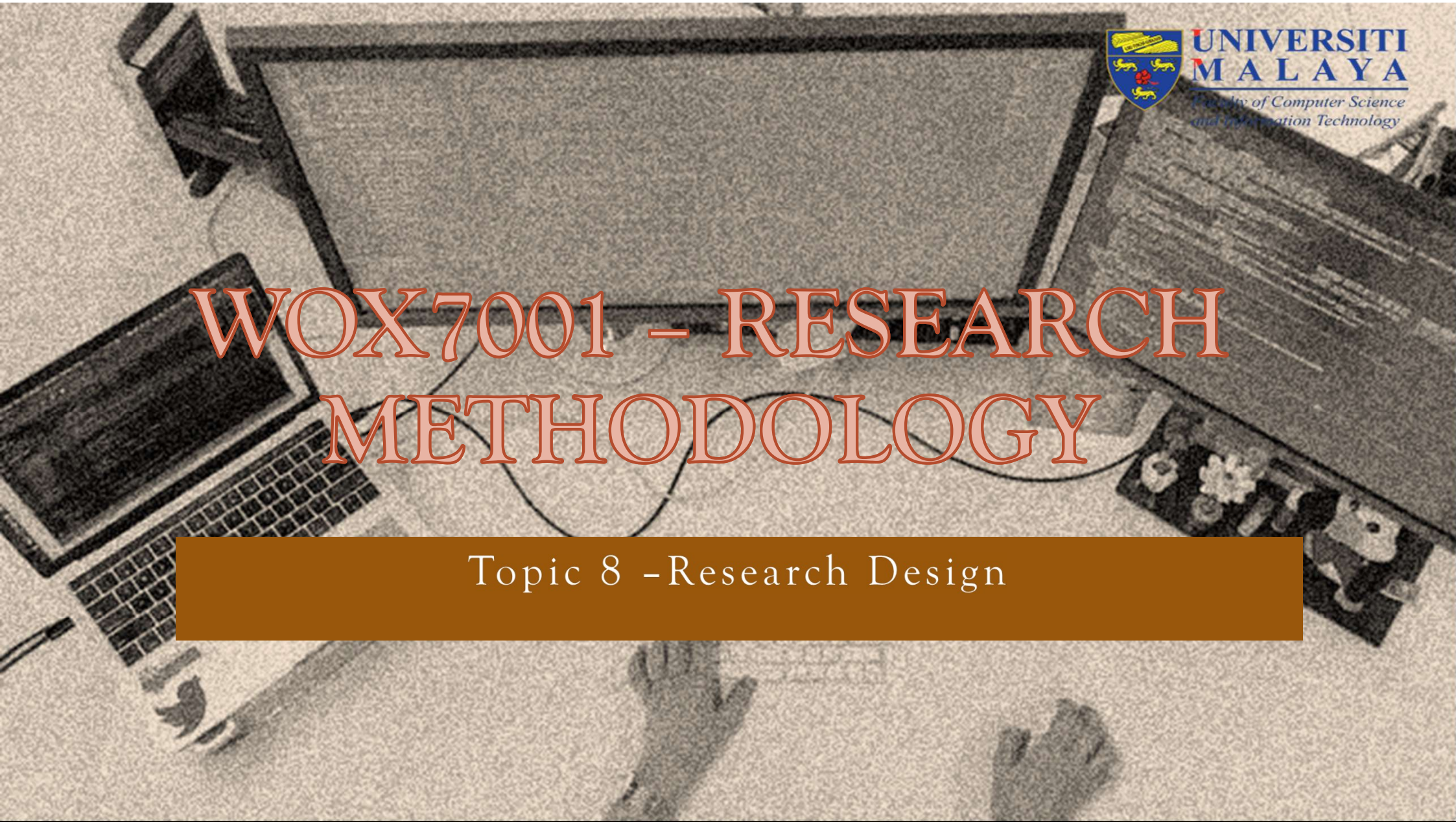


WOX7001 – RESEARCH METHODOLOGY

Topic 8 –Research Design

UNIVERSITI MALAYA
Faculty of Computer Science and Information Technology

Agenda

01

GOOD VS BAD DESIGN

02

DEVELOPING THE STUDY DESIGN

03

DESIGNING THE RIGHT INSTRUMENT

04

IMPLEMENTING THE DESIGN

Prepared by: HSM, NAG and SUH

Poor design vs. Good design

- Well-designed study
  - Hit on an idea, do background research
  - Formulate relevant, specific, practical RQs
  - Consider participants, context, data analysis in advance
  - Decde/develop instrument; pilot and revise it
  - Decide on appropriate pre/post-test instruments
  - Plan stages and structure of data collection
  - Prepare participants adequately
  - …Then carry out the study

The importance of good design

A well-designed study provides many benefits:

- Demonstrates researcher knowledge
- Ties the study to an underlying philosophy
- Provides a clear path for the researcher(s)
- Helps avoid mishaps of previous studies

Approaching the study

- Step 1: Hitting upon research ideas
- Step 2: Review of the literature
- Step 3: Formulating research questions

Step 1: Hitting upon research ideas

- Identify the topic in a few words
- Reflect on “doability” of research
  - Can I research this?
  - Should I research this?
  - Am I interested in researching this?
- Review of the literature can help redefine and revise ideas

Step 1: Hitting upon research ideas

- Pose a short question using “what” or “how”
- Write a short title that consists of one sentence under 12 words
- Ask a friend or colleague to read your topic and gauge their reactions
- Draft research questions to see if the topic can be adequately explored

Step 1: Hitting upon research ideas
A "researchable" topic

- "Can I do this in my current situation?"
- "Does this concern people at other institutions?"
- "Does this add to the current body of research related to this topic?"
- "Does this study contribute something from a unique perspective?"

Step 1: Hitting upon research ideas
Filtering ideas: A few hints

- Review research designs and statistical techniques
- Review teaching methods and overall SLA research results
- Evaluate access to potential study participants
- Plan time for material creation, study design, and implementation

Step 2: Reviewing the literature

- Relate the study to continuing “dialogue” in current research
- Finding a “gap” in the literature
- Provide a framework for the importance of the study

Step 2: Reviewing the literature
Finding a "gap" in knowledge

- "We do not enough about X…"
- "This way of looking at X has never been done…"
- "This way of learning about X has not been duplicated in my context"
- "Previous research has inadequately explored X…"

Step 3: Research Questions
A few useful guidelines

- Naturally flow from the literature review
- Strongly connected to the topic
- At least two or three (not one)…
- …but not five or six or more
- As specific as possible
- Directly concern variables in the study
- Do not contain yes/no question words

Step 3: Research Questions
RQs: What not to ask

- "Is X true/false?"
- "Will X happen if…?"
- "Does X cause Y?"
- "What do participants think of X?"
- "Why does X happen?"

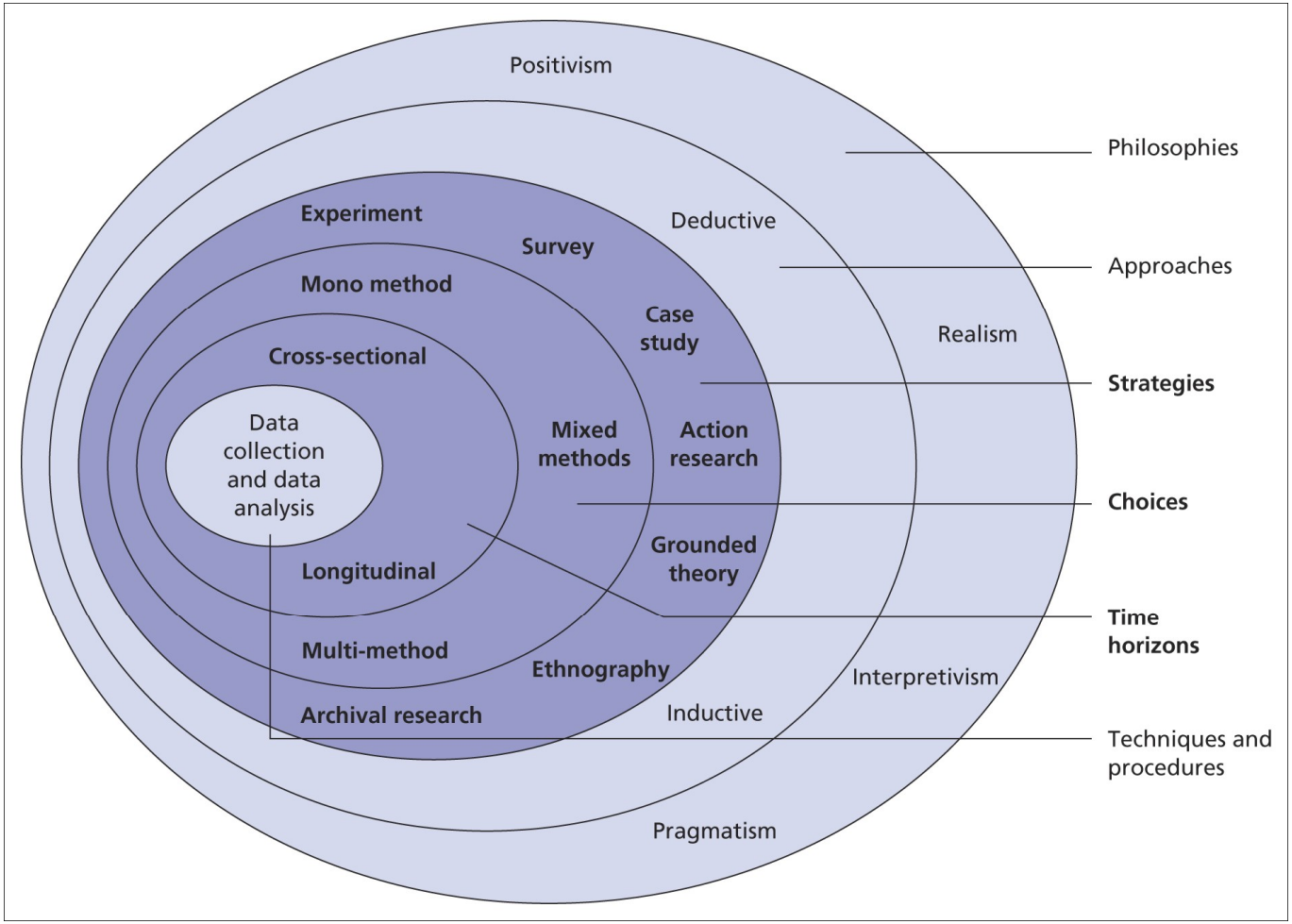
Step 3: Research Questions
RQs: What to ask

- “What differences exist between…”
- “Compared to X, how does Y…?”
- “To what degree do X and Y differ…?”
- “When X is controlled for Y…, how does Z…?”
- “What are underlying patterns among…?”
- “To what degree does X predict Y?”

Developing the Study Design

UNIVERSITI MALAYA
Faculty of Computer Science and Information Technology

Research Design and Tactics



Research design

- Cross-sectional design: A design in which data are collected from a sample at only one point in time.

- Longitudinal design: A design in which data are collected at more than one point in time.

Randomized Control-Group Pretest-Posttest Design

Experimental Group 1	T1	Xa (Method a)	T2
Experimental Group 2	T1	Xb (Method b)	T2
Control Group	T1		T2

Randomized Control-Group Pretest-Posttest Design

- Reasonably strong conclusions can be reached about the effects of the treatments.
- Problem 1: Within session variation (e.g., different teachers or room conditions) may intervene.
- The solution? Randomly assigning participants, times, and places to the experimental and control conditions.
- Problem 2: The pretest may interact with the treatment. This potential problem is dealt with in the next design.

Randomized Solomon Six-Group Design

Pretested (Random assignment)	T1	Xa (Method a)	T2
Pretested (Random assignment)	T1	Xb (Method b)	T2
Pretested (Random assignment)	T1		T2
Unpretested (Random assignment)		Xa (Method a)	T2
Unpretested (Random assignment)		Xb (Method b)	T2
Unpretested (Random assignment)			T2

Randomized Solomon Six-Group Design

- This design amounts to doing the experiment twice –once with and once without pretesting.
- It is possible to know what effects, if any, are associated with pretesting.
- If the results of the “two experiments” are consistent, greater confidence can be placed in the findings.

Counterbalanced Design

- This design is useful when randomization is not possible and intact groups must be used.

Counterbalanced design

- The counterbalanced design rotates out the participants' differences (e.g., one group has more aptitude or motivation than the other groups) by exposing each group to all variations of the treatment.
- Order-of-presentation effects are controlled.
- Primary weakness: The possibility of carryover effects from one treatment to the next exists. Allowing time between treatments can alleviate this problem.

Control-Group Time-Series Design

- This design allows the researcher to determine growth over time, and the effect of an intervention.

- The presence of a control group increases the trustworthiness of the results because the possibility of a contemporary event causing any gains can be determined.

Control-Group Time-Series Design

- This design can be extended by exposing the participants to the intervention on multiple occasions.
- This approach is more sensitive to partial gains in knowledge and tests the strength of the intervention more than once, thus giving the researcher a more accurate understanding of the effectiveness of the intervention.

- Experimental Group 1 T1 T2 Xa T3 T4 Xa T5 T6
- Experimental Group 2 T1 T2 Xb T3 T4 Xb T5 T6
- Control Group T1 T2 T3 T4 T5 T6

Designing the Right Instrument

Instrument Design

- Scored tests
- Rater scores
- Surveys
- Interviews

Instruments - Scored tests

Pluses

- Quantitative items (M/C, Cloze/C-tests)
  - Simple to score large # of participants
  - Easier to analyze
- Qualitative items (short answer, timed essays)
  - Good complement to quantitative scores
  - Can provide more in-depth assessment of participants' abilities

Minuses

Quantitative items

Limited to one type of data

Qualitative items

Take more time/effort to score

Rater bias

Instruments – Performance ratings

- An assessment of participants' performance in an assigned task
- Tasks may include presentations, interviews, written essays
- Performances can be scored using a Likert-scale, a rubric, or holistically
- Usually scored by at least two "expert" raters; sometimes also by peers

Instruments - Surveys

- Often used for:
  - Collecting learner history data (L2 study experience, other background info)
  - Assessing participants' attitudes towards a predetermined construct (language learning motivation, anxiety using the L2)
  - Determining reactions to an experimental treatment (teaching methods, innovative learning tasks)

Instruments - Interviews

- Interviews can provide an excellent qualitative component to a larger study
- It is not necessary to interview all participants
  - a subsample as small as 10-20% can be acceptable
- Use your best judgment on participants' language ability
  - For intermediate-and-above learners, L2 interviews are often fine

Instrument Validity

- The construct = The heart of the matter
- What construct do you wish to measure?
- How do you define the construct?
- What are its component parts? Do they form a unified whole?

IMPLEMENTING THE DESIGN

Including other researchers in the study

- The nature of the researchers involved
  - Main researcher plus “helpers”
  - One researcher plus “other participants”
- The nature of the instructors involved
  - Teaching methods
  - Students taught
  - Course goals
  - University program goals

Heading off potential problems

- Explain study commitments prior to starting the study
- Agree on “ownership” prior to data collection and data entry
  - Who will keep the data?
  - Whose name comes first, second, etc.?
- Keep everyone aware of deadlines
- Include everyone in decision-making processed and data analysis

Practical Issues

- Timing of implementation
- Learning and research context
- Participant consent
- Financial considerations

Timing of the implementation

- Beginning, middle, or end of semester
- Day of the week
- Time of day
- Exams and exam preparation periods
- “Culture Festivals” or other club-related events
- “Open classes” or “parents’ day”

Learning and research context

- Differing course goals (I.e., listening class vs. reading class)
- Different major field of study
- Gender, age, year in school
- Number of class meetings
- Perception of the value of research by institution heads

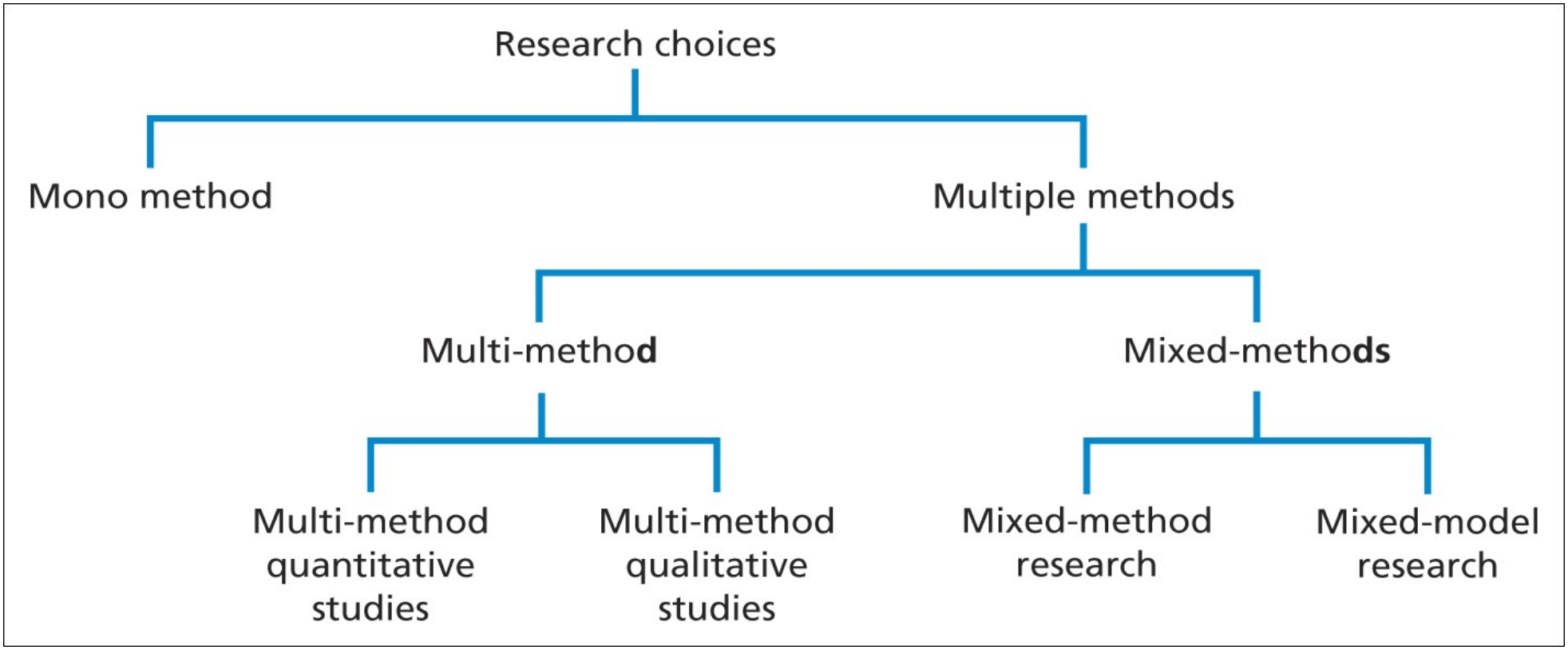
Participant consent

- Always allow for “non-participation” choice from potential participants
- Write clear instructions for participants asking for their cooperation
- Ask co-researchers or helpers to briefly inform participants about their choice

Financial considerations

- Copies for questionnaires, exams, etc.
- Computer analysis software
- Mailing costs
- Interview travel costs
- Recording equipment
- Reference books
- Journal article costs

Research choices



THANK YOU

Prepared by: HSM, NAG and SUH