Health Systems Science II
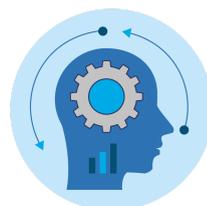
Module 5: Week 16 - Session 2

Activity 5.16.2: Unpacking the Categories of Quantitative Research Designs

This activity is an opportunity for you to contribute to your Portfolio of Learning by developing the following competencies:

 Scholarship	 **Systems Thinking**

Complete the worksheet and upload the completed worksheet to Ulwazi.

Step 1: Categorising Quantitative Research Designs according to their Experimental Nature

Construct a tool to aid your understanding of the different categories and subcategories of quantitative research designs according to their experimental nature. You can choose to use a mind-map, flow-chart, Venn-diagram, table or even a mixture of these tools. Use the information from the session to highlight the differences and similarities between the different categories of research design. Pay special attention to whether the independent variable is **manipulated**, the type of **control** applied, and whether there is **randomisation.** You are free to construct your tool digitally or physically on paper. If you choose to do the latter, you will have to take a photo and upload the photo of your work. Additionally, try to provide **an example** for each subcategory of research design to further aid your understanding.

To aid your creation of the drawing, here are the categories of quantitative research designs listed, according to their experimental nature:

- Non-experimental

  - Descriptive research designs

  - Correlational research designs

  - Ex-post facto ('after the fact') research designs

- Pre-experimental

  - Single group posttest only research design

  - Single group pretest-posttest research design

- Quasi-experimental

  - Posttest only non-equivalent control group research design

  - Pretest-posttest non-equivalent control group research design

  - Time-series design

- True-experimental

  - Posttest only control group research design

  - Pretest-posttest control group research design

🌕 Solomon four-group research design

1. Insert your tool to aid your understanding of the categories and subcategories of quantitative research designs according to their experimental nature in the block below. It is recommended that you provide an example for each subcategory.

Non-Experimental (No manipulation of IV, no control, no randomisation)
Descriptive → tells us about a situation
Example: Survey of prevalence of hypertension in Tshwane
Correlational → investigates relationships between variables
Example: Relationship between smoking and lung capacity
Ex-post facto ("after the fact") → compares two groups after events have taken place
Example: Academic performance of students who attended/didn't attend extra classes

Pre-Experimental (Some manipulation, weak control, no randomisation)
Single-group Posttest Only
Example: Assessing knowledge after a health education talk
Single-group Pretest–Posttest
Example: Weight taken before & after diet counseling in same group

Quasi-Experimental (Manipulation, partial control, but no randomisation)
Posttest Only, Non-Equivalent Control Group
Example: Intervention & comparison groups, one school receives nutrition education
Pretest–Posttest, Non-Equivalent Control Group
Example: Intervention & comparison groups both have before & after knowledge measured
Time-Series Design
Example: Clinic visits recorded for 6 months before & after new system

True Experimental (Manipulation, complete control, randomisation)
Posttest Only Control Group
Example: Randomly assign patients to new drug vs. placebo, measure outcomes later
Pretest–Posttest Control Group
Example: Randomly assign learners, measure before & after intervention
Solomon Four-Group Design
Example: 4 groups (2 pretested, 2 not), to measure pretest effect + intervention effect

Step 2: Categorising Quantitative Research Designs according to their Timing

With regards to the timing categorisation of different quantitative research designs, answer the following two questions:

1. What is the difference between a cross-sectional research design and a longitudinal research design? Use an example to illustrate the difference between the two.

Cross-sectional: Data collected at one point in time from different individuals.
Example: A survey of Tshwane resident's **current** access to water and sanitation

Longitudinal: Data collected from the same individuals **over time** to track changes
Example: Following the same group of patients with HIV over 5 years to monitor adherence to treatment

2. What is the difference between a retrospective research design and a prospective research design? Use an example to illustrate the difference between the two.

Retrospective: Looks backward in time, using existing records or participant's recollection
Example: Reviewing past medical records to study risk factors for TB among miners

Prospective: Looking forward in time, following participants to see outcomes.
Examples: Enrolling healthy individuals and following them for 10 years to see who develops diabetes