

Tutorial 9

1. Categorization of Research Questions as Longitudinal or Cross-Sectional Studies

Longitudinal Studies:

1. *What are the long-term effects of digital education initiatives on educational equity and student outcomes in rural versus urban areas of Sri Lanka?*
 - **Explanation:** This problem clearly contains a element of change over time, focusing on long-term effects, hence this is a longitudinal study.
2. *How will the integration of AI in healthcare, particularly in diagnostics and personalized medicine, impact patient outcomes and healthcare efficiency over the next decade?*
 - **Explanation:** This question look ahead into the next decade and require data collected over a long time, classifying it as a longitudinal study.
3. *What are the long-term psychological and social effects on children who grew up in environments with prolonged exposure to remote learning due to the COVID-19 pandemic?*
 - **Explanation:** This would be a longitudinal study since it would trace the psychological and social effects in a long period.

Cross-Sectional Study:

4. *How is the integration of artificial intelligence in the IT sector influencing the career prospects and skill requirements for fresh IT graduates in Sri Lanka in 2024?*
 - Explanation:** Although this might be interprete as cross-sectional, the attention paid to the ways in which the prospects of career development and skill requirement are already being changed by AI over time definitely makes it more appropriate for a longitudinal analysis.
5. *How does the rising cost of living in Sri Lanka influence dietary habits and nutritional choices across different income brackets?*
 - Explanation:** This will be a cross-sectional study because the comparison will be of different income bracket at one particular instance.

2. Information Needed for Any Longitudinal or Cross-Sectional Study

Longitudinal Studies:

1. Digital Education Initiatives

Data needed: Student performance metrics, educational equity indicators, demographic data, technological access, and usage patterns in rural and urban areas for a period of several years.

2. AI in Healthcare:

Data needed: Patient outcomes, healthcare efficiency metrics, AI adoption rates, diagnostic accuracy, treatment plans that are personalized, and the costs of healthcare over the next ten years.

3. Remote Learning Effects

Data needed: The psychological assessments, social behavior indicators, academic performance, and long-term health outcomes of children who have been exposed to prolonged remote learning, tracked over time.

Cross-Sectional Study:

4.AI in IT Sector:

Data needed: Career progression, acquisition of skills, adoption rate of AI technology in companies, job market trends, graduate employment rates, a number of years

5.Rise in Cost of Living and Eating Habits:

Data needed: Level of incomes, patterns of spending on food, dietary intake behavior, nutritional intake data, and cost-of-living indices, all at one point in time across different classes of income.

03. Proper Data Collection Methods

1) Digital Education Programs:

Data Collection Method:

Sampling: A stratified random sample of schools in rural and urban areas will be taken.

Data Collection Tools: Surveys, academic performance records, interviews with educators and students, technology usage logs.

Timelines: Data will be collected annually over a 5-10 year period.

2) AI in Healthcare:

Data Collection Method:

Sampling: Random sampling of hospitals and clinics using AI diagnostics and personalised medicine.

Data Collection Tools: Patient outcome databases, efficiency reports for healthcare, AI system performance metrics, surveys with healthcare professionals.

Timelines: The data will be collected biannually during the next decade.

3) Effects of Remote Learning:

Data Collection Method:

Sampling: Longitudinal cohort study in children exposed to remote learning as a result of the COVID-19 pandemic.

Data Collection Tools: Psychological assessments, social behavior surveys, academic performance tracking, health records.

Timelines: Data will be collected every 2-3 years as the children age.

4) AI in IT Sector:

Data Collection Method:

Target Population: IT Graduates from Sri Lanka; Focus: Entrance into fields related to AI

Data Collection Instruments: Questionnaires, Employer Interviews, Labor Market Analysis, Tests for Skills Assessment

Timeline: Data is Collected Annually so that changes can be tracked over time

5) Increasing Cost of Life and Eating Habits:

Method of Data Collection:

Sampling: Stratified random sample of households of different income groups.

Data Collection Instruments: Questionnaires, receipts of food purchases, records of nutritional intake, cost-of-living indices.

Cross-sectional: Data collected at one point in time; no follow-up required.