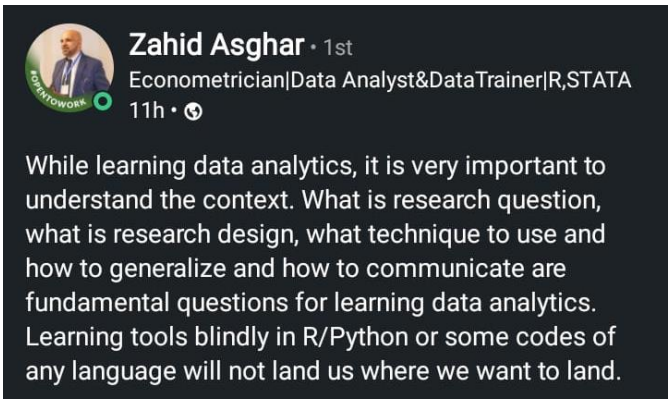
Outline – empoweR sessions

Experiential Learning Experiment

Module 1: Data Analysis

- **What is Data Analysis?**
- **Why learn Data Analysis?**

- **Where can Data Analysis take you?**
  - Academic Research (national and international thinktanks, Masters/PhD.)
  - Action Research (policymaking and problem solving)
  - Terrific internship/volunteer opportunities (private sector: IBTCI, IGO: International Organization of Migration, Development/Humanitarian NGOs: ACTED, IRC, Shelter Centre)
- **Why Learn the Theory behind Data Analysis and Visualization?**
  - Choosing between research methodologies (quantitative and qualitative)
  - Justifying one's analytical approach according to questions/objectives of study.



- **Data Visualizations is more than Choosing a Graph that Looks the Nicest:**
  - Avoiding mis/disinformation

Module 1.5: Understanding Data

- **Basics of Data:**
  - Levels of data (nominal, ordinal, interval, ratio)

Module 2: R Programming

- **Key Components of a Line of Code in R:**

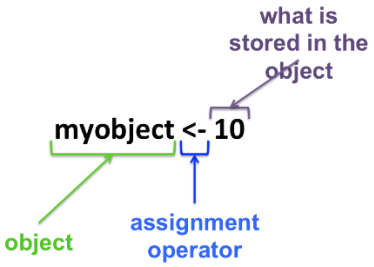


Figure 1: I will show some live examples.

- **Naming Conventions**
- **Functions and Arguments**
- **Packages**
  - What are R packages?
  - Installing and loading packages (I will give you a shortcut workflow for more than 1 package)
- **Where to look for help?**

Module 3: What Can You Do with RStudio

- **Exploring Data:**
  - Loading different types of data files
  - Exploring data (*head()/tail(), str(), glimpse(), skim(), names(), unique(), charSummary()*)
  - boxplots, bar plots, histograms, scatterplots, qqnorm/qqline (normality checks)
- **Cleaning Data**
  - Removing unnecessary symbols, punctuations etc. (*gsub(), stringr()*)
  - Dealing with missing data (*base functions, mice, VIM*)
- **Manipulating Data**
  - Tidyverse universe (*5 verbs*)
- **Describing Data**
  - Tables (*gttables*)
- **Visualizing Data** ggplot2 package
  - grammar of graphics: layers
- **Analyzing Data**
  - Parametric vs. non-parametric tests
  - Hypothesis testing (p-values)