

Skills for Class and Life

- Understanding the problem
- Reviewing the "knowns"
- Researching the "unknown"
- Formulating your strategy and determining (adopting the right method)
- Doing the work and understanding the data
- Applying the right tools for the job
- Analysis and answers or outcomes
- Conclusions
- Writing it up and presenting your work

Basics for Tool Selection

Word or word processing -

- Good => taking notes, building reports, writing your paper, keeping bibliographic data
- Bad => calculations, extensive drawing, very large files (can do it but be careful)

Spreadsheets -

- Good => calculations, lightweight graphing and charting, good at keeping track of simple data and tasks
- Bad => relational data, word processing or large text functions, drawing or art

Statistical packages - aka SPSS

- Good => advanced calculations, complex graphing and charting, deep data analysis
- Bad => simple calculations (the cutting butter with the chainsaw syndrome), graphing, charting or lightweight analysis

Databases -

- Good => storing a variety of data, data analysis and inspection, reporting
- Bad => accurate calculations, graphing and charting

Presentation Tools -

- Good => lightweight text, graphics, art, lightweight charting
- Bad => detailed text reporting, calculations, analysis

It is the summation of the right usage of these tools that makes a successful project, unfortunately no single tool can really cover all these requirements.

Exercise 1.1

You are in graduate school working on an important project concerning the increase in alternate energy forms and specifically the use of wind farms in the US from the year 2000 through 2008. You are to collect and store data from around the US, calculate the percentage of the US generating significant wattage from wind farms. You are hoping to get some grant money to study the correlation between this percentage and healthy ecosystems so you need to build a presentation to get that money. Describe the process that you will take and the tools you will use in the table below:

High Level Step	Best Tool for the Job
Understanding the problem	Your brain

Research Methods

Tools are most often used in the pursuit of completing some task or project. Modern research methods are applicable to many avenues in life, not just academically oriented jobs or pursuits.

It is worth taking a moment and discussing how research projects are done in science and social science, however, most research follows a similar set of generally accepted practices.

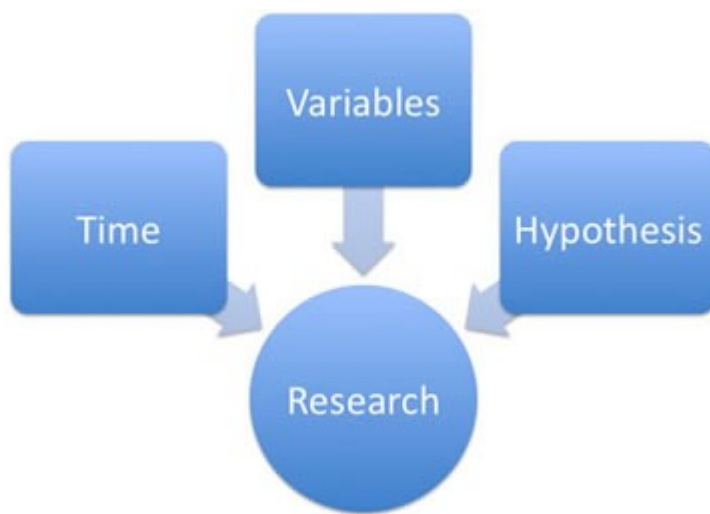
Research Projects are:

- descriptive = describing or observing an event, situation or environment. This type of research seeks to depict the nature of some phenomenon.
- relational = relational studies are pretty much true to their name in that they look at relationships between events, variables or situations and seek to understand those relationships.
- causal = this type of study takes relationships further by trying to not only see the relationships but to understand the impact and the cause between variables

Generally in social science research you are looking at the world, defining its meaning in terms of variables in some cases, understanding those variables and in some cases seeking to find the cause and effect between key variables.

The central components of research are:

- Time - how does time and times progression affect the subjects of the study
- Variables - quantitative (about numbers) or qualitative (categories or subjective classification), how can the subject under study be broken into its key elements in order to further define and understand it
- Hypothesis - this we will discuss later, but for now, let's us use a general definition from Trochim, et al - which states that a hypothesis is a prediction that a research project is specifically designed to prove or disprove. There are generally two hypothesis for any given questions, the alternative hypothesis which is usually your prediction and the null hypothesis which is every other possible outcome or answer for the question.



Exercise 1.2

You want to see the impact video games have on student attention span, formulate that alternative and null hypotheses.
