Applied Research and Statistics

Applied research projects in industry and in higher education are typically structured around a research approach that includes a topic, problem statement, research questions, hypotheses, statistical testing, and analysis of the results. Quantitative, case study, and mixed methods research approaches typically follow this scientific method for research.

The purpose of this module is to teach the scientific methodology for applied research and the use of statistics for hypothesis testing.

This module is designed for anyone involved in applied research including thesis students, doctoral students, and applied researchers.

Outcomes

1. Understand the types of applied research and the use of statistics in applied research.
2. Know how to use a data analysis tool pack and add-ons in Excel.
3. Know how to use the basic functions in Excel.
4. Know the basic statistical terminology.
5. Calculate and report descriptive statistics for a data set.
6. Select the right inferential statistical test.
7. Understand the meaning of the term significance.
8. Use a statistical table.
9. Create a problem statement based on a research topic.
10. Create a hypothesis pair based on the problem statement.
11. Perform a Chi-square test.
12. Perform a Spearman's Rank Correlation test.
13. Perform a t-Test.
14. Perform an ANOVA test.
15. Perform a MANOVA test.
16. Perform a Regression test.

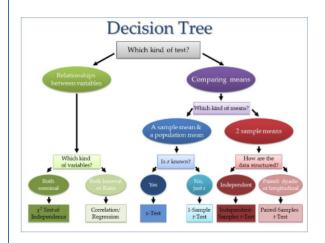## Recommended Learners

Higher Education

➢ Thesis Students

➢ Dissertation Students

Business, Industry, Nonprofits, & Agencies

➢ Business Researchers

➢ Business Analytics Specialists

What statistical test do we use? How to decide?

Decision Tree

Which kind of test?

- Relationships between variables
- Comparing means

Which kind of means?

- A sample mean & a population mean
- 2 sample means

Which kind of variables?

- Both nominal
- Both Interval or Ratio

Is σ known?

- Yes
- No, just s

How are the data structured?

- Independent
- Paired: dyadic or longitudinal

- x^2 Test of Independence
- Correlation/ Regression
- z-Test
- 1-Sample t-Test
- Independent-Samples t-Test
- Paired-Samples t-Test

Let us look at the figure to the left and review what we know.

What is our research question? *Is the intended learning outcome to significantly increase the student's knowledge level for a math course being achieved?*

The *t*-Test assesses whether the means of two groups are statistically different from each other. They are both sample means. This analysis is appropriate whenever you want to compare the means of two groups. A paired samples *t*-Test is used in a pre- and post-test scenario with the same individuals.

So, the test we choose in this example is the **Paired Samples *t*-Test.**

An example of a learning event in our Leading Edge Learning modules. The types of instructional content within the modules include: readings, videos, transcripts, audios, interactive questions, offline application exercises, flash cards, narrated presentations, matching exercises, relevant articles, downloads, a final exam, and other activities designed to engage learners based on recognized science of learning educational concepts.

Applications and Best Practices	
Higher Education	**Business, Industry, Nonprofits, & Agencies**
✓ Include in a research methodology and statistics course.	✓ Instruction for business researchers and analytics specialists.

Pricing		
Module is Approximately 18-25 Learner Hours		
1-100 Learners per Year	101-500 Learners per Year	500+ Learners per Year
$285 per Learner	$270 per Learner	$255 per Learner