Learn and Thinking Skills

Summarized & Presented By Dr.Engineer

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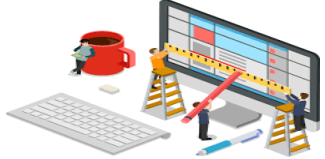
The Research Process



Research matters will introduce you to a research project that touches on the content.

The research that we feature is only one example of many that will help show you how actual researchers approach actual problems in doing their work.

In this first research class, I hope you pay attention to the introduction of some terms and phrases that may be new to you but you will become more familiar with as you move through the upcoming classes.

You'll also see how researchers focus on real-world problems and issues in their work.

Here's where a scientist takes her own interest within a theoretical framework and applies that knowledge to a real-world question regarding why adolescents might, and do, read recreationally. A significant question answered in a systematic and comprehensive way.

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From Problem to Solution

All you need to do is to identify an **interesting question, collect some data or do some code or some approves or some practical experiment, and poof!—instant research**! **Not quite.** The model of scientific inquiry (discussed in Lecture Num 2) does a nice job of specifying the steps in the research process, but there is quite a bit more to the process than that.

Keep in mind, however, that the meanings of the words problem and solution go beyond solving a simple problem of the 2 + 2 = 4 variety.

Rather, the questions that researchers ask often reflect a more pressing social concern or economic issue. In addition, the results from a research study often provide the foundation for the next research endeavor.

What are the factors that influence the use and students' satisfaction of the systems at your institute?

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One of the most creative things about the studies is the way in which these researchers collected their data.

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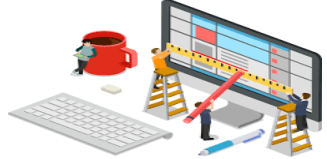
Researching in our field



in our fields we have many examples for researching: Statistical Math and Coding are the main three variables that will company u in the future in IT and CS fields.

- develop a code to enhance the detection of cancers in image processing.
- develop an algorithm for networks and fiber optics better efficiency.
- develop a code for machine.
- helps in data science.
- approve some math problems.
- writing a code for some math equation.
- measuring some things to provide a clear idea about it.
- using statistics to approve a new idea, develop a theory.
- do a new model or framework or a theory.

Language of the research

Null hypotheses, Independent variables, dependent variables, Factorial designs.

Research hypotheses, Samples, Populations all these and other new words and phrases form the basis for much of the communication that takes place in the research world.

As with any endeavor, it is difficult to play the game unless you learn the rules.

The rules begin here, with a basic understanding of the terminology used by researchers in their everyday activities.

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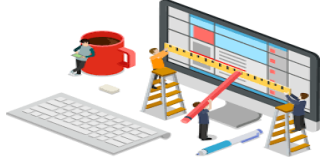
Main Types of variables



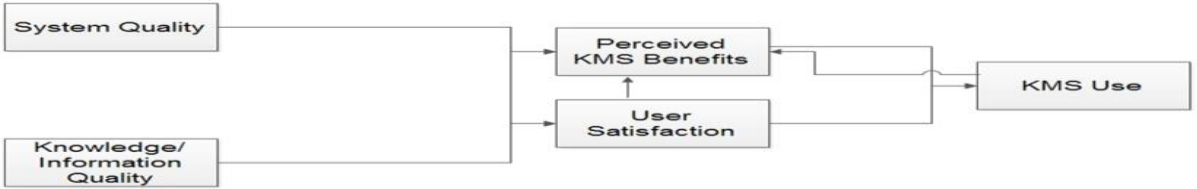
Variables: The word variable has several synonyms, such as changeable or unsteady.
Our set of rules tells us that a variable is a noun, not an adjective,
and represents a class of outcomes that can take on more than one value.

As example **hair color** is a variable that can take on the values of red, brown, black.
The variable **security** includes (security, privacy and authentication).

1. **Dependent variable:** represents the measure that reflects the outcomes of a research study.

2. **Independent variable:** represents the treatments or conditions that the researcher has either direct or indirect control over to test their effects on a particular outcome.

The independent variable is that which is manipulated or changed to examine its effect upon the dependent variable.



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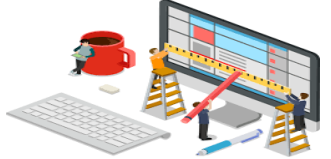
Hypothesis



A good hypothesis provides a transition from a problem statement or question into a form that is more amenable to testing using the research methods we are discussing.

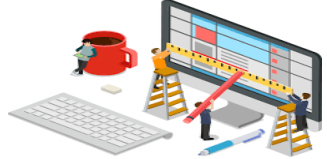
A null hypothesis: is an interesting little creature. If it could talk, it would say something like, "I represent no relationship between the variables that you are studying."

In other words, null hypotheses are statements of **equality**.

Example

- There is no relationship between personality type and job success.
- There is no difference in voting patterns as a function of political party.
- The brand of ice cream preferred is independent of the buyer's age, gender, and income.
- There is no relation between systems security and users' satisfaction.

Hypothesis



First, the null hypothesis acts as a starting point because it is the state of affairs that is accepted as true in the absence of other information.

let's look at the null hypothesis stated:

There will be **no difference in the average score of ninth graders and the average score of 1 2th graders on the ABC memory test**.

Given no other knowledge of 9th and 12th graders' memory skills, you have no reason to believe there will be **differences between the two groups.**

You might speculate as to why one group might outperform another, but if you have no evidence a priori (before the fact), then what choice do you have but to assume that they are equal?

This lack of a relationship, unless proved otherwise, is a hallmark of the method being discussed.

In other words, until you prove that there is a difference, you have to assume that there is no difference.

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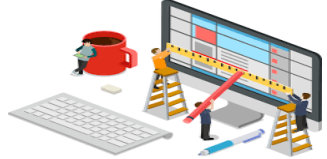


The research hypothesis: Whereas a null hypothesis is a statement of no relationship between variables, a research hypothesis is a definite statement of the relationship between two variables.

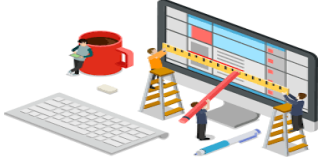
Research hypotheses are statements of **inequality**.

Example

- There is a relationship between personality type and job success.
- Voting patterns are a function of political party.
- The brand of ice cream preferred is related to the buyer's age, gender, and income.
- Systems Security Significantly effect users' satisfaction.

These research hypotheses posit a relationship between variables, not an equality.
The nature of this inequality can take two different forms:
directional and non-directional.

Hypothesis



If the research hypothesis posits no direction to the inequality (such as different from), then the research hypothesis is a non-directional research hypothesis.

If the research hypothesis posits a direction to the inequality (such as more than or less than), then the research hypothesis is a directional research hypothesis.

There are some differences between the research hypothesis and null hypothesis:

First, the null hypothesis states that there is no relationship between variables (an equality), whe reas the research hypothesis states that there is a relationship (an inequality).

Second, null hypotheses always refer to the population, whereas research hypotheses always re fer to the sample.

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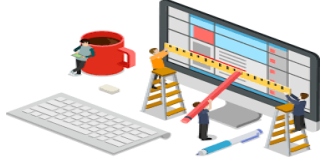
Hypothesis



Hypotheses are educated guesses. Some guesses are better than others right from the start.

I cannot stress enough how important it is to ask the question you want answered and to keep in mind that any hypothesis you present is a direct extension of the original question you asked.

This question will reflect your own personal interests as well as previous research. Good hypotheses are declarative in nature and posit a very clear and unambiguous relationship between variables.

Examples

- Development the “A” algorithm will enhance the speed of transferring the data.
- Information quality positively effect satisfaction and has a significant relation.

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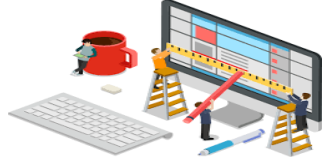
criteria of a goof hypothesis



A good hypothesis is stated in declarative form and not as a question. Hypotheses are most effective when they make a clear and forceful statement.

A good hypothesis posits an expected relationship between variables.

Hypotheses reflect the theory or literature upon which they are based.

A hypothesis should be brief and to the point. Your hypothesis should describe the relationship between variables in a declarative form and be as succinct (to the point) as possible.

Good hypotheses are testable hypotheses.

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criteria of a goof hypothesis

Complete and well-written hypotheses should

- Be stated in declarative form.
- Posit a relationship between variables.
- Reflect a theory or a body of literature upon which they are based.
- Be brief and to the point.
- Be testable.

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THANK YOU!