

# Literature Search/Review

## Chapter 4

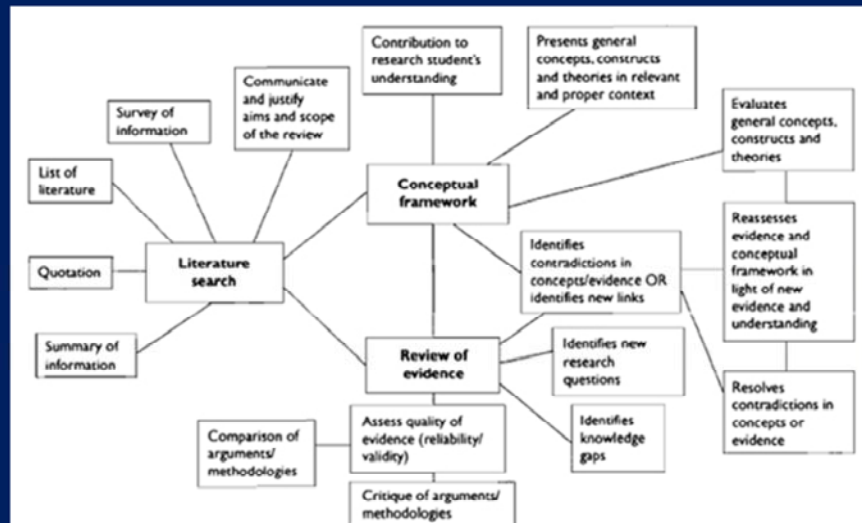
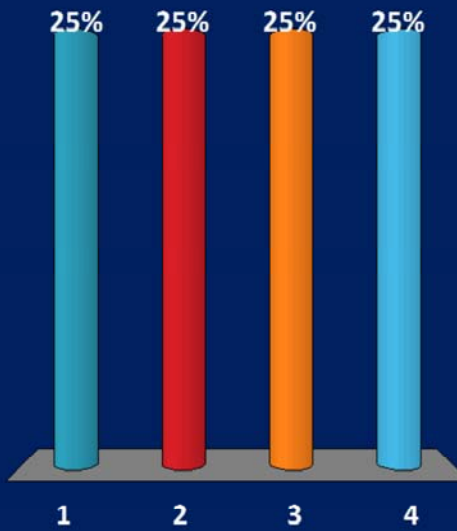


Figure 4.1 Relationship diagram to represent the aims of a literature review

The diagram identifies certain areas that are important to keep in mind when writing a literature review, but you do not have to memorize this or put yourself under these structural constraints. Writing a literature review can really be done using a “common sense” approach. In many ways once you have done the lit. review and read over the available information, you begin to notice common themes and can use these to build your lit review/research program. My own experiences...

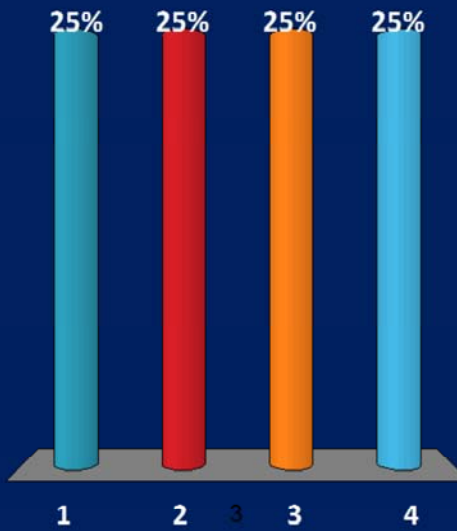
## Goals are:

1. Specific steps measuring achievement
2. Broad long-term aims
3. Quantitative data
4. Process-oriented cognitive activities



## Objectives are:

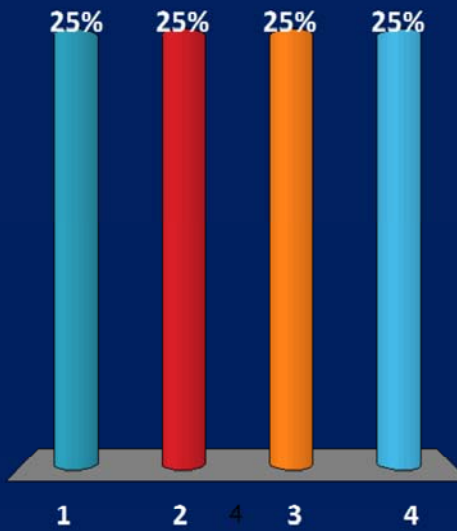
1. Specific steps measuring achievement
2. Broad long-term aims
3. Quantitative data
4. Process-oriented cognitive activities



1

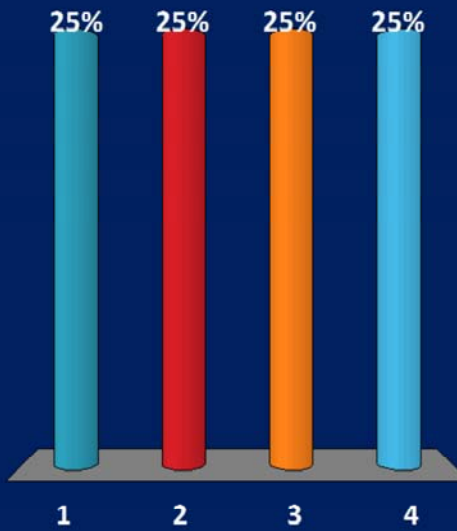
## A hypothesis is:

1. A program indicator
2. Broad long-term aims
3. An educated guess
4. Process-oriented cognitive activities



## Internal validity relates to:

1. A program indicator
2. How well the experimental design allows for accurate results
3. An educated guess
4. How well the results relate to other situations



2

## Thesis = 2 step process

- Step 1: search the literature
- Step 2: research the problem



## Purpose of a Literature Review

- Can help you formulate a specific research problem.
- Present background information



State what is similar though not necessarily identical to your own research. (As a researcher you should know the literature about your topic very well.)

## Benefits of a Literature Review

1. Increases your confidence
2. Provides new ideas and approaches
3. Contact info
4. Use methods and designs of others
5. Identify new sources of data
6. Interpretation



#3: Contact other researchers with questions, etc.

#4: if they got published in a reputable journal using these designs and methods then they must be decent! To identify a good article from a “reputable journal” one rule of thumb is to use articles that are cited by 3 or more other researchers. Whenever possible try to read the article for yourself rather than relying on a different author’s interpretation.

(Sometimes the information is from a presentation or a thesis or dissertation that is unavailable).

#6 It can help you interpret and make sense of your findings and, ultimately, help you tie your results to the work of those who have preceded you. i.e. if one researcher identifies that adding nitrogen to switchgrass makes it turn blue and you added nitrogen to your switchgrass and it turned blue then you can corroborate their data and have some way of backing up your claim



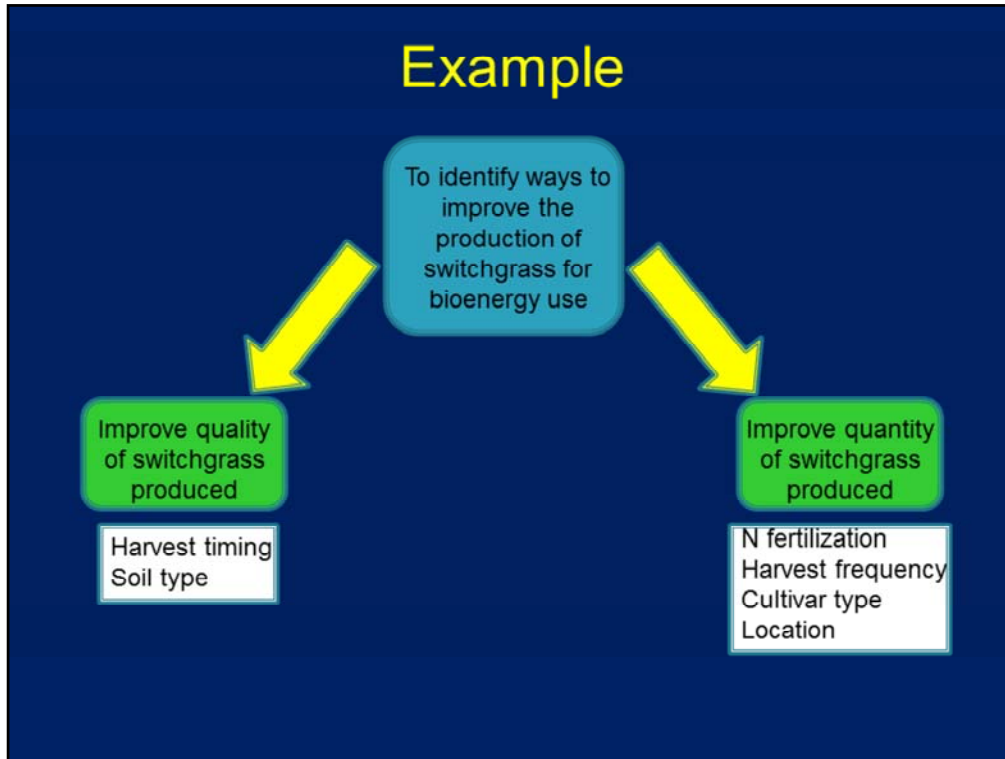
## Preparing for a Literature Review

1. Write the problem at the top of a sheet of paper.
2. Write each sub problem –across page.
3. Identify keywords and phrases in each sub problem.
4. Write keywords under appropriate sub problem. The list you generate becomes your “agenda” as you read literature.
5. Go to the library to seek out resources related to your agenda.
6. Read and take notes.

How do you know when you are done?

1. How do bioenergy-related quality characteristics in switchgrass change during growth?
2. How does nitrogen in switchgrass grown for bioenergy change during growth?  
How does ash content in switchgrass grown for bioenergy change during growth?
3. Nitrogen, switchgrass, bioenergy, growth  
Ash content, switchgrass, bioenergy, growth

A rule of thumb to identify when you are done is that you start to see repetitive patterns in your reading (i.e. familiar arguments, methodologies, and findings....the same key people and studies cited over and over). You get the feeling, “I’ve seen this (or something like it ) before”. You are no longer encountering new viewpoints.



These kinds of lists may be difficult to come up with prior to searching the literature but are also good in organizing your thoughts before writing the literature review.

## Critical Analysis of Prior Research

- Was an appropriate method used to measure a particular outcome?
- Are the data and results derived from a relatively large number of people, objects or events?
- Have other possible explanations or conclusions been eliminated?
- Can the results obtained in one situation be reasonably generalized to other situations?

Involves evaluating the value of data and research results in terms of the methods used to obtain them and their potential relevance to particular conclusions.

#1 This one will come with time and experience.

#2 Replication is always important, most field studies use 3 or 4 replicates, human studies use many more

#3 Could there be other variables involved that the researcher does not look into? (i.e. If I am measure in the carbon dioxide coming from a field and attributing it to the plant root respiration, could there be other factors contributing to this flux?)

#4 If farmers don't irrigate switchgrass, then don't irrigate switchgrass when you are doing the research.

# Taking Notes

## #1 Read papers, highlight or underline

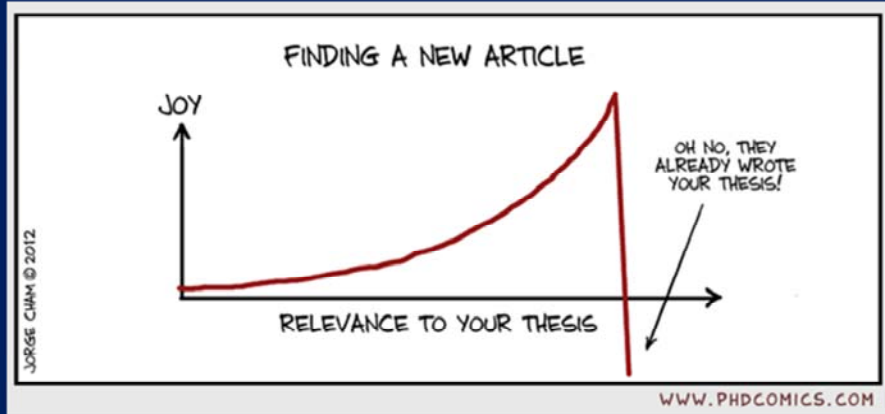
- Write out bibliography (bold and underline)
- Copy down notes
- Add citations in bold
- Add annotations, make outline

## #2 Mendeley

- [www.mendeley.com](http://www.mendeley.com)
- “like iTunes for research papers”
- free program, sign up and download



#1 example is handout; instead of this method  
#2 example in class “how-to”



## Writing a Literature Review

1. Organize
2. Remember your audience.
3. Synthesize what you have learned from your review.

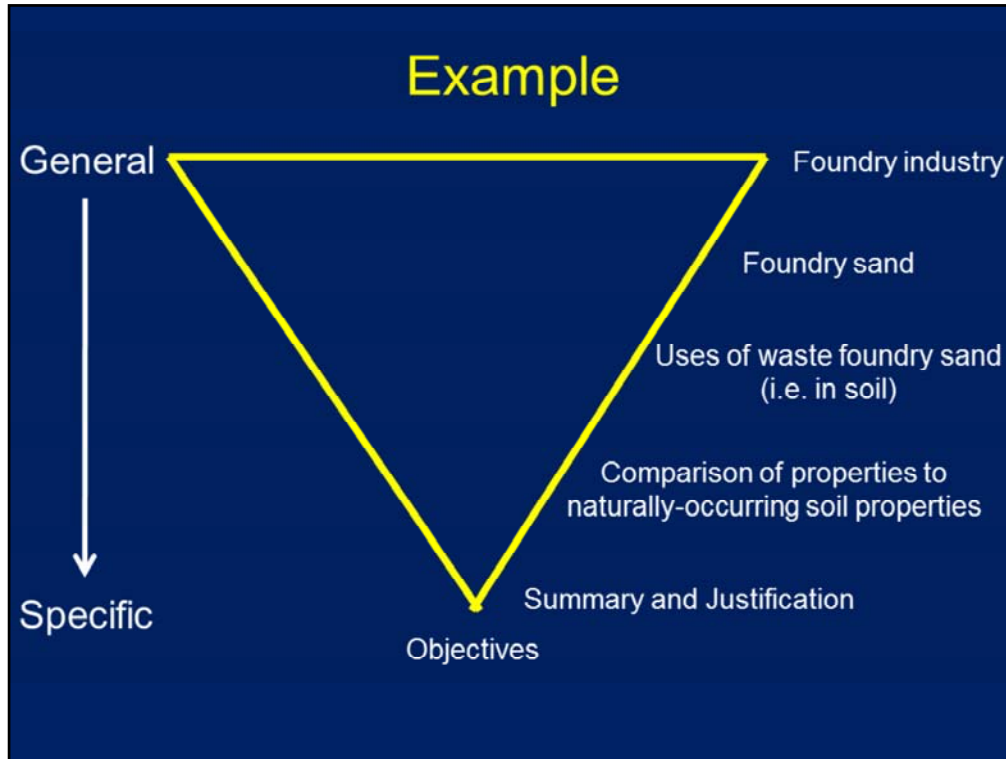


1. Just like you speak with your friends differently than you speak with your parents, professors, strangers, it's the same idea when writing. Most of you will be focusing on the scientific community but some may be looking at other specific populations (parents, homeowners, farmers, etc.). It is good to identify your audience so that you have an idea of their knowledge base and what they know and don't know.

2. Here are some examples of what you might do:

- Compare and contrast varying theoretical perspectives on the topic.
- Show how approaches to the topic have changed over time.
- Describe general trends in research findings.
- Identify contradictory findings, and suggest possible explanations for such discrepancies.
- Identify general themes that run throughout the literature.

Never take other people's conclusions at face value; determine for yourself whether their conclusions are justified based on the data presented



Regardless of what note-taking system you use, make sure to make an outline before starting to write your literature review.

Another example of a literature review is the introduction section of research articles. Think of it as a “mini” literature review. The literature review for your thesis may be longer and go into greater depth than these but they can give you an overall view of the structure (i.e. progression from general to specific) and tying everything up with how it all relates to your own objectives.

Last paragraph you go in for the kill (i.e. briefly summarize and provide justifications for why your research will be important in light of current knowledge...“sell it”). Provide clear objectives.

# Descriptive Research

## Chapter 9





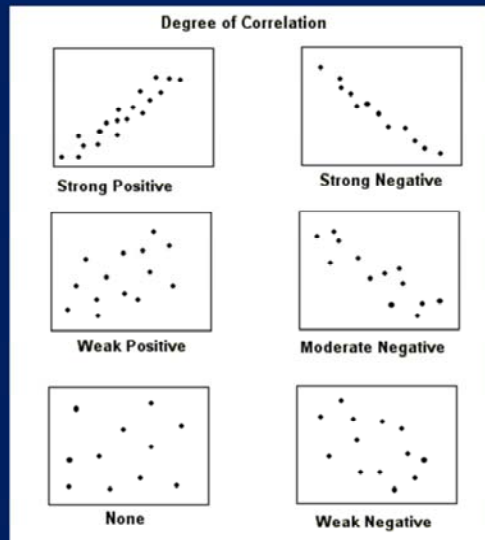
## Survey

- Of those that used Facebook, 60% had a GPA below 3.0 (Table 1)
- Display data discussed in text as a graph or table
- Number table or graph in order of its appearance in the text
- Don't show the same data in a graph and table
- Don't compute means from intervals, either use percentages or ask open-ended questions
- Use past-tense, 3<sup>rd</sup>-person
- Make user-friendly tables and graphs

Mention Results and discussion  
Emotionless, formal language  
Correlations

## Descriptive Research Designs

- Correlational
- Developmental
- Observational
- Survey research



Correlational: how well two variables relate to each other (i.e. facebook usage vs. GPA scores)...these have a number of different relationships but most common are those that create a  $y=x$  line (also includes logarithmic, exponential, polynomial). Correlation coefficient relates to how well the data fit to the line (regression line)...range is from -1 to 1...the closer the value is to 1 or -1 the better the fit and the better the correlation. Correlation does not indicate causation...other hidden variables could be causing the effect to occur. Would poor accuracy or poor reliability affect a correlation coefficient?

Developmental: cross-sectional study (identify numerous age groups) vs. longitudinal study (follow people over a period of time)

Observational: count or rate behavior...to maintain objectivity have the behavior clearly defined, use specific time segments, have multiple people rate the behavior, train the raters

WHY IS THAT WOMAN SCOWLING  
AT ME? DO I KNOW HER?



If she loves you more each and every day,  
by linear regression she hated you before you met.

## Sampling

- Probability sampling
  - Random selection
  - Random sample
  - Random numbers table and Random.org

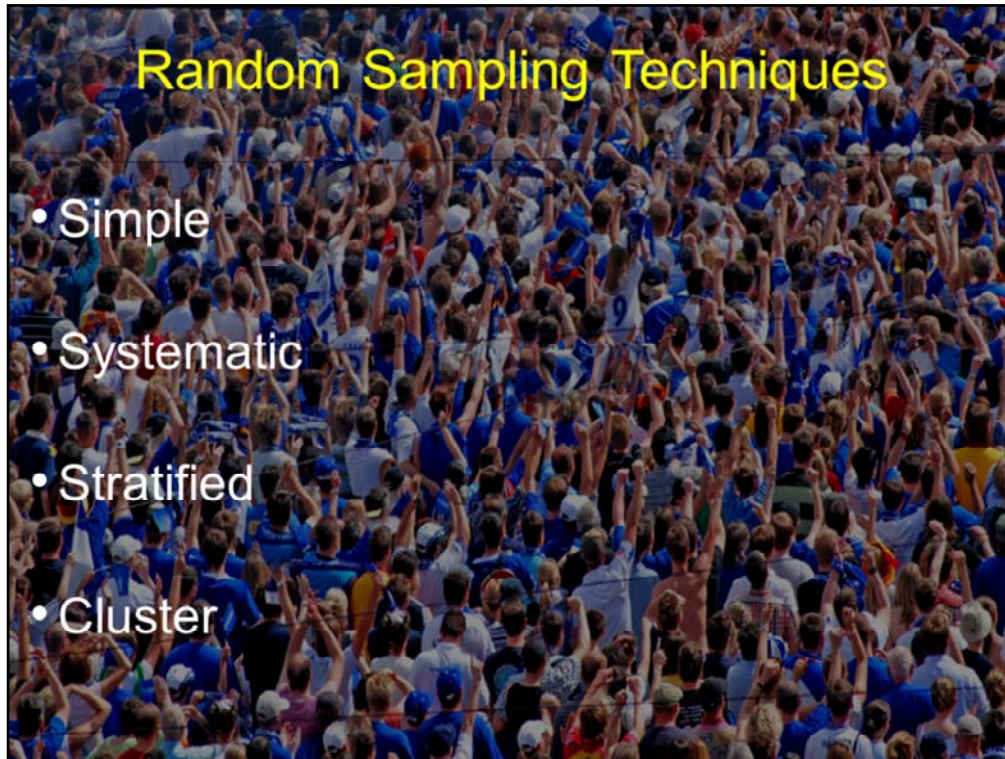
**Part of a  
Table of Random Numbers**

61424	20419	86546	00517
90222	27993	04952	66762
50349	71146	97668	86523
85676	10005	08216	25906
02429	19761	15370	43882
90519	61988	40164	15815
20631	88967	19660	89624
89990	78733	16447	27932

Probability sampling: specify in advance that each segment of the population will be represented

Random selection: choosing a sample in such a way that each member of the population has an equal chance of getting chosen

Random sample: has similar characteristics of the population



**Simple Random Sampling:** All individuals in the defined population have an equal and independent chance of being selected in the sample. (table of random numbers or [www.random.org/](http://www.random.org/))

**Systematic Random Sampling:** All members in the defined population are placed on a list for random selection, and e.g., every 6<sup>th</sup> person is chosen after a random starting place.

**Stratified Random Sampling:** This is to assure that certain sub-groups are represented in proportion to their numbers in the population. Each list (frame) is separately numbered and random selection is used. A definite rationale should exist for using strata. Proportionate stratified random samples are often chosen wherein the % in the sample is = to the % in the population for the given characteristics.

**Cluster Random Sampling:** The unit of sampling is not the individual but rather a naturally occurring group of individuals, e.g., counties, schools, clubs. Called “Experimental Unit” in experimental studies and affects degrees of freedom (df). Therefore if you select 16 random schools from a state, your unit of analysis (EU) is schools and not 960 students who might be in the schools.



Nonprobability sampling: no way to guarantee sample is representative of population

Convenience sampling: street-corner sampling...people that happen to be a part of the survey by chance due to their location

Quota sampling: same as convenience sampling except try to get the same proportions of people as are in the population

Purposive sampling: choosing people or groups for a particular purpose (i.e. those typical of a group)



## Basic vs. Applied Research

- Basic
- Applied



Basic: is intended to enhance our theoretical conceptualizations about a particular topic (i.e. psychologist studies the nature of people's cognitive processes, ornithologist studies the mating habits of a particular species of birds).

Applied: address issues that have immediate relevance to current practices, procedures, and policies (i.e. effectiveness of different teaching strategies on students, effects of fertilizers on switchgrass growth).

## Pre-test/Post-test vs. Post/Then test



Both are used to document behavior/skill/disposition or knowledge change.

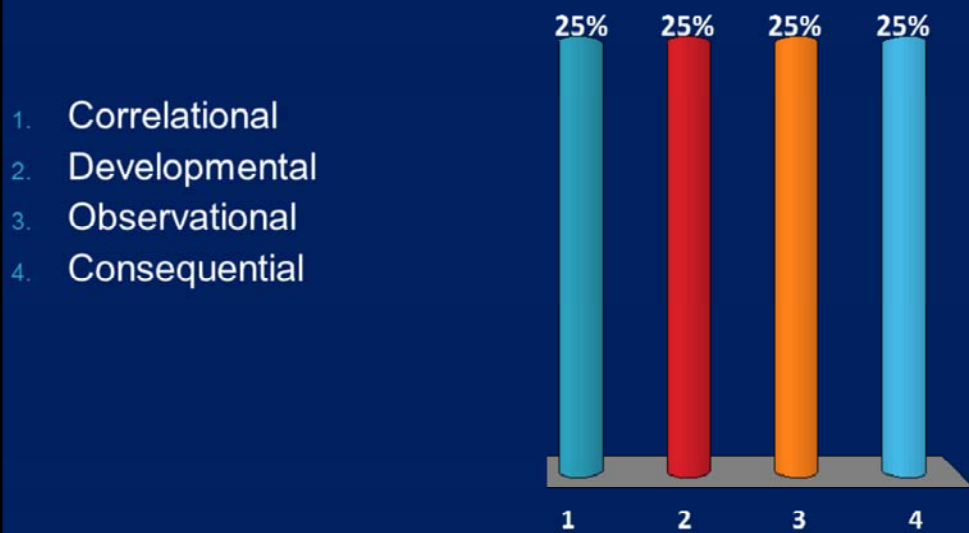
Pretest/posttest: A pre-test is given at the beginning, then some type of teaching or learning demonstration/experience takes place, followed by a post-test to identify change in knowledge or behavior. When used to document behavior, one downfall in this technique is that the participants may have limited knowledge in the subject matter to really give an indication of their baseline behavior. May also score themselves lower in the post-test once they find out what they don't know.

Post/Then test(Retrospective-post): Following the demonstration, two tests are given. One relates to participants' behavior prior to the demonstration knowing what they know now and the second test relates to their behavior now. With the post-then test, a participant may more accurately determine, once information is given, their baseline behavior.

For example, if you were to ask a group if they included at least one food high in Vitamin C in their diet each day, the participants may not know all of the foods high in vitamin C. Following a weekly lecture on the nutrition, they may more accurately define this initial baseline at the end of the course.



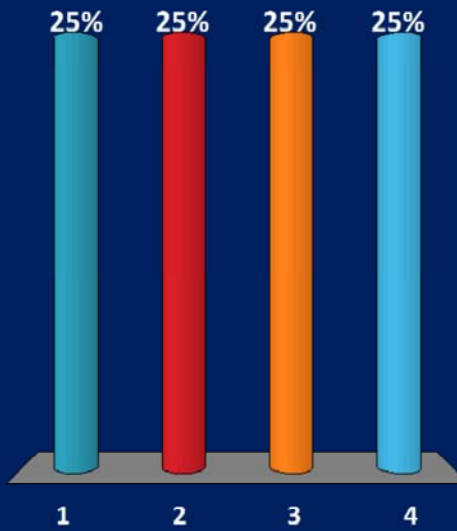
A research design that rates or counts behaviors is:



3

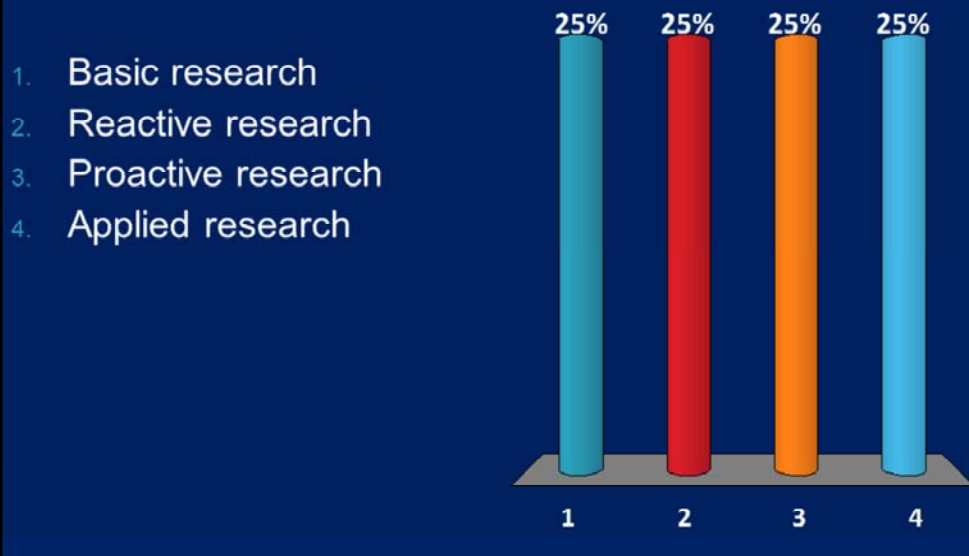
## Sampling to get the correct proportions as the population:

1. Probability sampling
2. Purposive sampling
3. Quota sampling
4. Stratified sampling



3

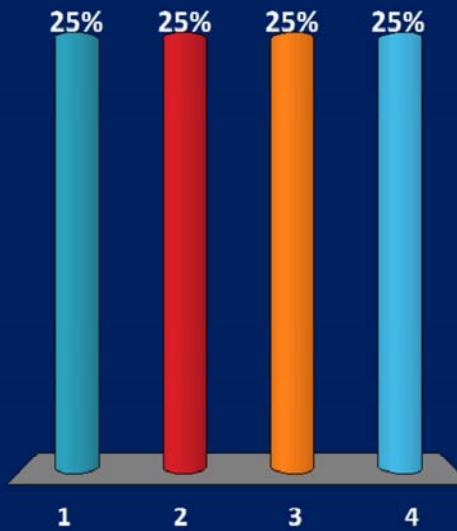
## Research to identify how things work is called:



1

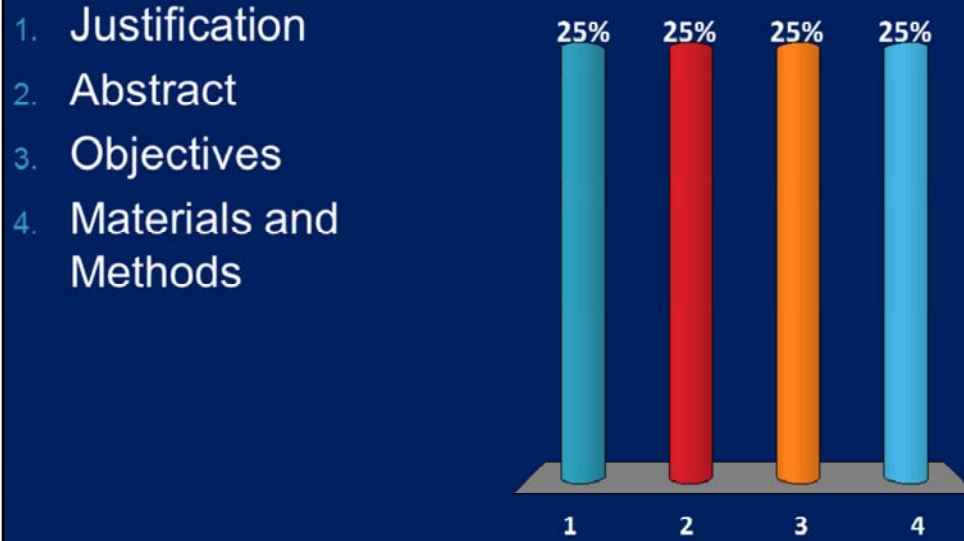
## A literature review should:

1. List what has been done before
2. Synthesize previous research from the literature together
3. Explain what will be done
4. How well the results relate to other situations



2

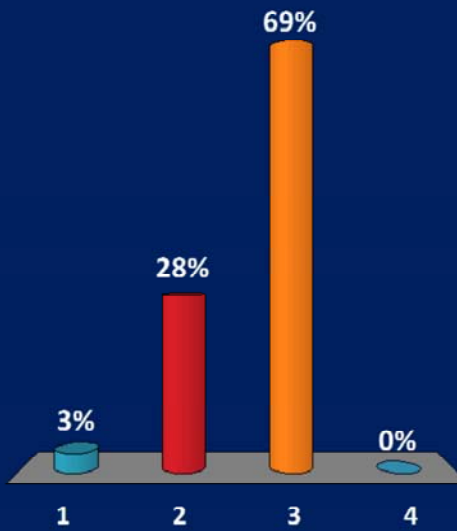
## A literature review should end with:



3

What type of random sampling involves choosing every nth person from the population?

1. Simple
2. Stratified
3. Systematic
4. Cluster



3