

Course Name	: Research Methods & Data Management
Course Code	: APBSS 303
Course Level	: Level 3
Credit Unit	: 4 CU
Contact Hours	: 60 Hrs

Course Description

This Course explores basic philosophy of research, its types and variables, its defines sampling design, research design, methods/tools of data collection, planning the survey as a tool of data collection, the structure of a research proposal , modes of analysis, interpretation and validation.

Course Objectives

- To provide students with descriptive and exploratory skills required in research.
- To help them develop writing skills in relation to research discoveries from different research studies undertaken.
- To provide students with a better analytical perspective on the findings acquired from the field.
- To expose students to the field experiences in attempts to collecting data.

Course content

Introduction

- Definition of research
- Different forms of research
- Distinguish between qualitative and quantitative variables
- Differences between qualitative and quantitative research
- Concepts that relate broadly to both quantitative and qualitative research

Sample Design

- Definition of sampling
- Different types of both random and non-random sampling

Research Design

- Meaning of a research design
- Types of research design i.e descriptive designs, co relational designs, case study designs
- How to design and conduct a case study

Methods of data collection

- Observation method
- Survey
- Group interviews (Focus Group Discussions)
- Questionnaires
- Advantages and disadvantages of each stated method/tool

Planning the survey as a data collection tool

- Hypotheses
- Determine the respondents
- Questionnaire, interview or telephone survey
- Format issues
- Rules for asking good questions
- Analyzing survey data

The structure of a research proposal

- Title
- Table of contents
- An abstract
- Chapter one: Background to the problem
- Chapter two: Literature review
- Chapter three: Methodology
- Chapter four: Results/findings of the study
- Chapter five: Discussion, conclusion and recommendations
- References
- Appendices

Assessment

Coursework 40%

Exams 60%

Total Mark 100%

Introduction

This module generally focuses on the various health research methods used in public health, with these methods various techniques are applied to identify issues. By the end of this module one should be in position to identify the various research methods and explain them efficiently as well as knowing their relevancies

Course work

- a) Through proper explanations and illustrations briefly explain ten medical research methods used in public health.
- b) What is the importance's of research to the profession of Public health and the health fraternity as a whole

What Are Health Services Research Methods? Why Are They Important?

In the 1960's, the field of health services research was created by combining several study sections at the National Institutes of Health to create the Health Services Research Study Section. The HSR study section sought to define HSR as a distinct field of scientific inquiry at the intersection of public health and medical care, informed by disciplinary perspectives. Since that time, the field has evolved to encompass multiple disciplinary perspectives, including methods from cognate disciplines such as economics, statistics, political science, sociology, and many other schools of thought. The field has also developed new models and techniques to address research questions in specialized areas of inquiry such as patient safety and access to care.

Due to the breadth of the field, two terms are critical to defining the scope of health services research methods. These are: 1) health services research, and 2) methodology.

The Academy Health definition of health services research, developed in 2000 by Kathleen Lohr and Don Steinwachs, is as follows:

Health services research is the multidisciplinary field of scientific investigation that studies how social factors, financing systems, organizational structures and processes, health technologies, and personal behaviours affect access to health care, the quality and cost of health care, and ultimately our health and well-being. Its research domains are individuals, families, organizations, institutions, communities, and populations.

An additional definition of health services research is provided by *Lexikon*:

Research concerned with the organization, financing, administration, effects, and other aspects of health services. Health services research is often concerned with the relationships among need, demand, supply, use, and outcomes of health services. Structure, process, and outcome of health services may be evaluated. Evaluation of structure is concerned with resources, facilities, and manpower; process, with matters, such as where, by whom, and how health care is provided; and outcome, with the results of the services (such as the degree to which individuals receiving health services actually experience measurable benefits).

Methodology is the collection or study of methods (practices, procedures, and rules) used by those who work in a discipline or engage in an inquiry, as in the methodology of measuring, assessing, and improving performance. Methodology addresses the full range of issues confronted by empirical work in health services research, including conceptualization, modelling, literature review, study design, sampling, data collection, measurement, and research ethics.

By combining the definitions above, it is apparent how wide the scope of methods employed by health services researchers is. HSR methods encompass a variety of study frameworks, designs, and analytic techniques. These include a spectrum of methods, from understanding of various epistemological perspectives on research, to study designs including focus groups and randomised controlled trials, to specific analytic techniques such as longitudinal data analysis.

To help organise the array of HSR methods, core and desired resources have been divided into 18 major topic areas, including:

Economics & Cost Effectiveness
Epidemiology
Ethics
Evaluation
Health Services Research Applied Methods
Information Technology
Management Sciences
Medicine
Outcomes Research
Policy
Psychology
Public Health
Qualitative Research
Quality and Safety
Sociology
Statistics, Biostatistics & Econometrics
Survey Research
Trials

Reviewing the topic areas above, it is apparent that HSR methods are not confined to disciplinary methods, but rather, are unique in their approach to medical and health care

delivery questions because the field was developed to facilitate study of applied questions. These include:

- Who has access to health care?
- Do patients in large urban areas receive the same level of services as those in rural areas?
- At different levels of care, which patients have the best outcomes?

Many of these types of questions have policy implications. As a result, funding for health services research has often been linked to political interests. Yet, HSR studies are girded by the same methods as many other disciplines. As discussed above, econometric, epidemiological, survey research, and other widely accepted methods form the backbone of HSR.

A related challenge for health services researchers is that the types of questions of interest to the field rely on the ability to generalise from data to the population at large. In order to collect information that may be generalised to the population, it is often necessary to draw associations from existing sources of data such as claims databases or large population surveys - frequently referred to as observational data. Observational data is collected in situations when it would be unethical or impractical to randomize participants to one condition or another - such as having or not having health insurance. Because the data is not randomised, it is not possible to assume that an intervention causes a particular outcome; rather, researchers rely on statistical analyses to draw associations between factors in a study.

Despite concerns about the shortcomings of using non-randomised data in HSR studies, there are major benefits to studying the implications of care delivery or policy at the population level. The scope of HSR studies often allows for greater understanding of an intervention's effectiveness, or effect in a real-world population, as opposed to randomized controlled trials, which are better at assessing efficacy -- the outcome in an ideal, controlled population. In addition, HSR studies have always been closely linked to policy considerations, and as such, have the potential to enhance understanding of health care systems and impact care delivery for large numbers of individuals.

For librarians it is becoming increasingly important to create a collection of materials that address the types of applied questions that health services research addresses. This is a daunting task because of the breadth and depth of the disciplines and subjects encompassed by HSR. As the list of disciplines and topic areas relevant to HSR demonstrates, a wide array of disciplines are included in the health services research methodological 'toolkit'.

Librarians may wish to utilise the module by choosing specific content areas that will benefit their personal library needs. Likewise, faculty developing new courses may look to this list for suggested current textbooks in the field. The organisation of the list is intended to facilitate understanding of the array of options in different disciplines.

This list of resources is not intended to define the full range of HSR methods texts, rather, to provide a set of resources considered valuable by librarians and academics in the field of health services research.

The field of health services research is continually expanding and developing new methods to apply to health care and health care delivery questions. Due to the fact that the field is growing rapidly, we recommend that users of this list search for updated versions of the resources cited here in order to ensure the most recent information on methodological topics.

They are basically two main types of research methods which is quantitative and qualitative, which all the methods lie under

Research and experimental development (R&D) comprise creative work undertaken on a systematic basis in order to increase the stock of knowledge, including knowledge of man, culture and society, and the use of this stock of knowledge to devise new applications." Thus research is a careful and systematic investigation in some field of knowledge such as culture of people, religion, etc (Neon 1995)

Variable: Variables are properties or characteristics of some event, object, or person that can take on different values or amounts (as opposed to constants which do not vary). When conducting research, experimenters often manipulate variables. For example, an experimenter might compare the effectiveness of four types of antidepressants. In this case, the variable is the "type of antidepressant" I.e. attributes which take on different values from time to time e.g.

- Height
- Weight
- Age etc

The following are the types of variables

1: Independent variable

When a variable is manipulated by an experimenter

2: Dependent variable

The experiment seeks to determine the effect of the independent variable on relief from depression. In this example, relief from depression is called a dependent variable.

In general the independent variable is manipulated by the experimenter and its effects on the dependent variable are measured.

Or

Dependent variable: a variable in a logical or mathematical expression whose value depends on the independent variable; "if $f(x) = y$, y is the dependent variable"

Consider age with beauty of an individual: beauty deterioration of an individual is caused by advancement in age .Age is an independent variable and beauty is the dependent variable.

3: Extraneous variable; this is the characteristics whose effects are not needed in the study like noise, for the case if one is studying the causes of lack of concentration in a given computer class or any other class.

4: Active variables characteristics that can be manipulated e.g. study environment or teaching methods etc

5; Assigned variables, certain characteristics assigned by nature and can not be changed or manipulated like height, sex of individual, age etc

Qualitative and Quantitative Variables

Qualitative variables: These are variables that express a qualitative attribute. Some examples of qualitative variables are hair color, eye color, religion, favorite movie, gender, and so on. The values of a qualitative variable do not imply a numerical ordering. Values of the variable "religion" differ qualitatively; no ordering of religions is implied. Qualitative variables are sometimes referred to as categorical variables. Values on qualitative variables do not imply order, they are simply categories

Quantitative variables: These are variables that are measured in terms of numbers, Some examples of quantitative variables are height, weight, and shoe size.

Discrete and Continuous Variables: Variables such as number of children in a household are called discrete variable.

Discrete variables: These are variable with possible scores of discrete points on the scale e.g a household could have three children or six children, but not 4.53 children. Other variables such as "time to respond to a question" are continuous variable

Continuous variable: These are variables where the scale is continuous and not made up of discrete steps e.g. The response time could be 1.64 seconds, or it could be 1.64237123922121 seconds. Of course, the practicalities of measurement preclude most measured variables from being truly continuous.

Random selection: is how you draw the sample of people for your study from a population.

Random assignment is how you assign the sample that you draw to different groups or treatments in your study. It is possible to have both random selection and assignment in a study. Let's say you drew a random sample of 100 clients from a population list of 1000 current clients of your organization. That is random sampling. Now, let's say you randomly assign 50 of these clients to get some new additional treatment and the other 50 to be controls. That's random assignment

Concepts that relate broadly to both quantitative and qualitative research

Association:

Sometimes there is a relationship between two variables but the relationship may not be causal i.e., neither variable is dependent upon the other. It may be seen that short men are more assertive than taller men but it does not follow that being short causes men to be assertive and we can not state that being assertive make a man short; there is no causal relationship

Bias:

Distortion of the findings resulting from an undesirable influence.

Causality / Causal relationship:

A relationship in which one action brings about (causes) a particular consequence. More correctly, (since research can only hope to disprove a theory rather than prove it), a relationship in which failure to do 'x' means that 'y' will not follow. E.G., We can be less certain that bathing in the sun for two hours around midday causes skin to burn, than we can know that keeping out of the sun for the two hours around midday is unlikely to cause skin to burn.

Hawthorn Effect:

A psychological response in which subjects alter their behaviour because they are aware of their participation in the study

Piloting:

A small-scale trial of the research method to ensure that the design is feasible, Although only a small number of subjects may be used, a variety of practical questions may be determined. E.g., can the subjects understand the questions they are being asked?

Population:

Literally means "all the people" and in research the term is most commonly used to refer to a specific group of people. However, in a research context, population refers to all the members or objects of any defined group which might be taken or about which information might be

given. A research population refers to the entire group to which the research results apply e.g., a relevant age group, or equipment group such as syringes.

Sample:

Refers to the segment of the population that is selected for investigation (the subset of the population)

Sampling frame: it is the listing of all the units in the population from which the sample will be selected

Census: this is a complete enumeration of an entire population

Reliability:

Is concerned with the accuracy (consistency, stability and repeatability) of a measure in representing the true score of the subject being assessed on a particular dimension, the same results must be achieved, as far as possible, regardless of whom is doing the measuring. e.g., several nurses weighing the same patient on the same set of scales, in quick succession, should gain the same results. Reliability of measurement reduces influence or bias on the part of the person(s) doing the measurement, to a minimum.

Representative:

Refers to the extent to which a sample reflects the "truth" for the whole population in the study. The sampling technique should aim to ensure that the views of the population are reflected by the sample.

Validity:

Refers to whether a particular instrument actually measures the construct it is designed to assess. e.g., a cardiac monitor is not a valid tool for measuring the peripheral pulse. A cardiac monitor is a valid tool for measuring the electrical activity of the heart.

Internal validity:

The extent to which the effects detected in a study are a true reflection of what is real, e.g., if the detected effect is that better nutrition leads to greater height gain in infants, internal validity exists if the height gain can not be attributed to another factor. (NB this other factor may be referred to as a confounding or extraneous variable).

External validity:

"The extent to which study findings can be generalised beyond the sample used in the study" (Burns and Grove 1993) e.g., One study may find that better nutrition leads to increased height gain in infants but external validity exists only if this finding is found with other samples.

NB the concept "Variable" appeared on the glossary of the previous session

SAMPLE DESIGN

The way of selecting a sample from a population is known as sample design. It describes various sampling techniques and sample size. It refers to the technique or procedure the researcher would adopt in selecting items for the sample.

Sampling:

Sample; Sampling; method of selecting a certain number of units from a total population (Macleod Clark J and Hockey L. 1981)

The way a sample is selected should be clearly demonstrated in a research report. The aim of a sample is that it should be as unbiased a cross section of the "parent" population as possible, i.e., a sample of subjects needs to be as representative as possible of the population under study.

To obtain a cross section we need to devise a sampling frame to define the boundaries (limits) within the context of the study and to reflect the organization within which the sampling is taking place.

The larger the size of the sample, the lower is the likelihood of it failing to represent the population under study. However, the law of diminishing returns tells us that there is, for each study, a desirable sample size under which they may fail to be accurate yet above which there is no better a reflection of the parent population.

Sampling may be

- a) Random and non random sampling.
- b) Non random: In a nonrandom sample, members are selected on the basis of a particular set of characteristics, rather than a random chance of being included and certainly it introduces bias.

Random- Random sampling is completely based on chance. For example, one might identify all members of a population, ($n=250$) write their names on separate pieces of paper, and then draw 25 names out of a hat to determine who is actually to be included in the study and every individual has a chance of being included in the study.

Types of random sampling

Systematic

Is a statistical method involving the selection of every k^{th} element from a sampling frame, where k , the sampling interval, is calculated as:

$k = \text{population size } (N) / \text{sample size } (n)$

- Stratified
- cluster sampling

Stratified sample

In a stratified sample the sampling frame is divided into non-overlapping groups or strata, e.g. geographical areas, age-groups, genders. A sample is taken from each stratum, and when this sample is a simple random sample it is referred to as stratified random sampling.

Where there is heterogeneity in the population this can be reflected in the strata, i.e., each stratum can be weighed to reflect the heterogeneity. In this way a proportional representation of the whole population can be gained.

Cluster sample

Best used where there is a wide geographical spread. Clusters may be chosen subjectively to be representative of the whole. The clusters can be further stratified. E.G., if we want to know about all A&E patients in the country we need to take a sample from a variety of A/E's. Each department can bring a number of patients into the sample according to whether they meet the stratification criteria and it is often used in marketing research

Multistage sampling

This is the use of sampling methods that are considerably more complex than these other methods. The most important principle here is that we can combine the simple methods described above in a variety of useful ways that help us address our sampling needs in the most efficient and effective manner possible. When we combine sampling methods, we call this multi-stage sampling.

Concepts strongly associated with quantitative research

Survey:

Involves the study of a large number of subjects drawn from a defined population

Randomisation:

A method for controlling possible extraneous variables involving assigning objects (subjects, treatments etc.) to a group or condition in such a way that every object has an equal probability of being assigned to any particular condition. Randomisation can also be applied in other settings for research e.g., within a questionnaire there may be a sequence of questions, which, if reordered randomly, may evoke different responses because the previous question does not then influence the current question.

Control:

In order to increase the probability that findings accurately reflect the reality of the situation being studied, the study needs to be designed in such a way as to maximise the amount of control over the research situation and variables. Through control the influence of extraneous variables, variables which are not being studied but which could influence the results of the study by interfering with the action of the ones being studied, is reduced.

Manipulation:

Refers to the fact that we can create artificial divisions and circumstances in order that we can test a particular hypothesis, In experimental research the "causative" variable must be amenable to manipulation by the investigator; i.e., the researcher "does something" to subjects in the experimental condition. Subjects in the control group are not "manipulated" in the way that subjects in the "experimental group" are manipulated.

Treatment Group: The portion of a sample or population that is exposed to a manipulation of the independent variable is known as the treatment group. For example, youth who enroll and participate in recreation programs are the treatment group, and the group to which no recreation services are provided constitutes the control group

Confounding Errors

Errors: are conditions that may confuse the effect of the independent variable with that of some other variable(s).

1. Premeasurement and interaction errors
2. Maturation errors
3. History errors
4. Instrumentation errors
5. Selection bias errors
6. Mortality errors

Measurement (levels)

Nominal: Subjects of research are differentiated by possessing or not possessing a given characteristic, e.g., pass/fail, single/married, and divided into a number of categories but the difference between the categories is not measurable in any real sense. This is the least sophisticated level of measurement.

Ordinal: Subjects are ranked in order from greatest to least or best to worst. Again there is no precisely measurable difference between the ranks.

Interval: Genuinely quantitative measurement such as that of temperature is measured at the interval level of measurement. Here the difference between 10 and 11 degrees centigrade is the same as the difference between 11 and 12degrees centigrade.

Ratio: In a scale of measurement where the difference between points on the scale is precise (as in the measurement of height and weight,) *and the scale starts at zero* the level of measurement is referred to as ratio. Height and weight start at zero. You can not weigh less than 0.00kg and cannot be less than 0.00mm in length/height; these are ratio scales. You can however record temperatures of the weather in terms of minus x degrees centigrade and this is why the scale is interval and not ratio.

Research Design

Research design can be thought of as the *structure* of research -- it is the "glue" that holds all of the elements in a research project together or plan for a study that guides the collection and analysis of the data

We often describe a design using a concise notation that enables us to summarize a complex design structure efficiently. What are the "elements" that a design includes?

Types of design:- Experimental design , Quasi-experimental design, Survey design, cross-sectional design, Case studies, comparative study etc

The research design:

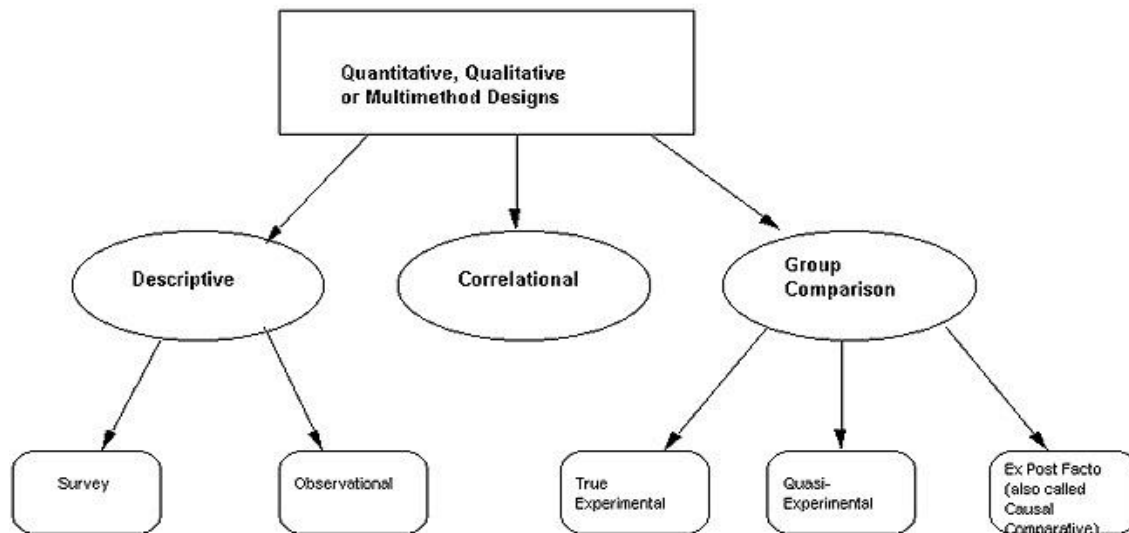
- (1) Is driven by their search problem
- (2) Depends upon how much is known about the problem

Types of Research Design

For example, if you are doing a study where you will be *rating* students (numerically) on their performance of a sensory-motor skill AND also *interviewing* these students (data in words) to determine how they perceive their own skill levels (if one does that!), *then at least one "design methodology label" that would apply is "multimethod."*

Now, some design labels apply only to qualitative studies -- while others could apply to a study that's any of the of designs. We'll look at the qualitative labels in a future follow-up lesson. For now, let's look at the possibility: families of design methodology labels that could apply to any/all of the above 3 possibilities.

Figure 2.



Design Methodology That Correspond To Quant/ Qual/ Multi method Studies

Most of these, as we'll see, "link" to certain "keywords" in the research question or problem statement!

I. Descriptive Designs

Example: This study is to *identify* the perceived barriers to successful implementation of the Career Ladder Teacher Incentive & Development Program in X School District.

"Identify"/"what is - what are" (the perceived barriers) - > Descriptive problem statement AND also descriptive research design methodology!

Two "sub-types" (add'l. design methodology labels that could apply to "descriptive designs):"

Survey - This label also applies to any study in which data or responses (be they quant/qual/both) are recorded via any form of what we think of as "survey instrumentation." You've probably seen (more than you care to think about! if you've been 'approached' by a 'needy dissertation stage doctoral student' to participate in his/her study!) such surveys. They can take many forms:

- Check-off items (e.g., gender, position);
- Fill-in-the-blank items;
- Likert-type scales (e.g., on a 5-point scale, say, from "strongly disagree" to "strongly agree," you're asked to circle or check your opinion regarding a statement such as, "The Career Ladder Teacher Incentive and Development Program provides ample opportunity for teacher advancement in my district")
- Open-ended fill-in items (you're asked to give a response in your own words, using the back of the survey sheet or extra paper if necessary; something like "Please state the three

main reasons you chose to apply for the Career Ladder Teacher Incentive and Development Program this year.")

Types of Survey Research

While often these surveys are paper-&-pencil in nature (e.g., you're handed one or receive it in the mail & asked to fill it out and return it to the researcher), they are sometimes "administered" orally in a face-to-face or telephone interview (e.g., the researcher records your answers him/herself).

Some Guidelines for Interviews

There are other variations on survey-type questions; the above are just examples of the most common forms and scaling of such responses.

If the responses to our earlier example were collected in the form of a survey -- be it, say, Likert-scaled attitudinal items and/or open-ended questions where the teachers are asked to share the perceived barriers in their own words -- then the study would be characterized as a *descriptive survey design methodology*.

E. **Observational** - In these design methodologies, instead of administering a survey instrument, the researcher collects data by observing/tallying/recording the occurrence or incidence of some outcome -- perhaps with the aid of assistants.

He/she might want to identify the most frequently occurring type(s) of disruptive behavior in a particular classroom. With clear prior agreement on what constitutes such "disruptive behavior" (operational definitions of our variables are important, remember?! It becomes an issue of "reliability," or verifiability that "we saw what we saw" vs. "our own bias" of what constitutes this disruptive behavior!), the researcher could develop a listing of such behaviors and observe and record the number of times each one occurred in a particular observation session in a classroom. (Again, he/she might wish to 'compare notes' with assistants in order to enhance reliability or verifiability -- e.g., as a cross-check for accuracy).

This type of research would warrant the design methodology label of not only "descriptive" (due to the 'identify/what is - what are [the most frequently occurring ...]?') but also "observational" due to the recording/tallying protocol.

(By the way, qualitative-type observations can also be recorded. They don't have to be strictly numeric tallies. Examples that come to mind include case notes of counselors, where they record their perceptions in words.)

II. Correlational Designs

We've seen these too! Just as in the case of "descriptive" designs, these "link" to the keywords of "association," "relationship," and/or "predictive ability" that we've come to associate with "correlational" research questions or problem statements!

Correlational Research

III. Group Comparisons

We've briefly talked about "experiments" generally, in terms of "key features" such as the following:

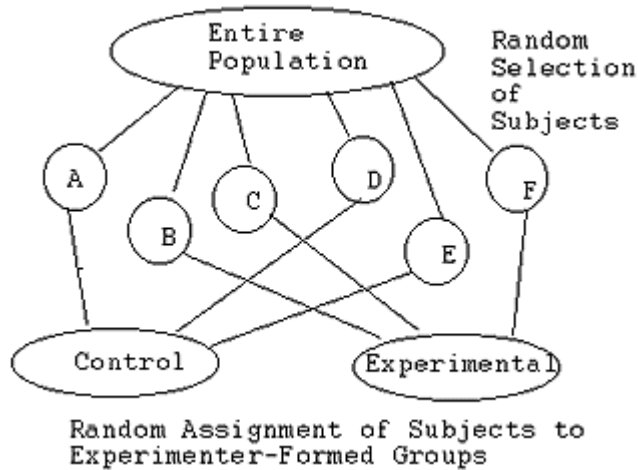
a. **tight control** (the researcher attempts to identify in advance as many possible 'contaminating' and/or confounding variables as possible and to control for them in his/her design -- by, say, building them in and balancing on them -- equal numbers of boys and girls to 'control for gender' -- or 'randomizing them away' by drawing a random sample of subjects and thereby 'getting a good mix' on them -- e.g., all levels of 'socioeconomic status')

b. because of the preceding control, the 'confidence' to **make cause/effect statements!**

That is, we begin to get the idea of ***2 or more groups, as balanced and equivalent as possible on all but one "thing:" our "treatment"*** (e.g., type of lesson, type of counseling). ***We measure them before and after this treatment and if we do find a difference in the group that 'got the treatment,' we hope to attribute that difference to the treatment only*** (because of this tight control, randomization, and so forth).

Now ... there are actually two "sub-types" of experimental designs. Plainly put, they have to do with how much 'control' or 'power' you as the researcher have to do the above randomization and grouping!

A. **True experimental** - If you can BOTH randomly draw (select) individuals for your study AND then randomly assign these individuals to 2 or more groups (e.g., 'you have the power to make the groups' yourself!), then you have what is known as a true experiment.'



In the preceding scenario, the researcher first:

1. Randomly selected subjects A through F from the larger population; AND
2. Then randomly assigned these individuals to (experimenter-formed) groups. In our example, by coin-flipping or some other random procedure, Subjects A, D & E "landed" in the control group (e.g., the class that will get the traditional lecture), while Subjects B, C, & F "landed" in the experimental or treatment group (e.g., the researcher-formed class that will get the hands-on science instruction, say).

The two levels of "randomization" help to ensure good control of those pesky contaminating or confounding variables, don't they?! You're more likely to get a "good mix" on all those other factors when you can randomly draw your subjects and also randomly assign them to groups that you as the researcher have the "power" to form!

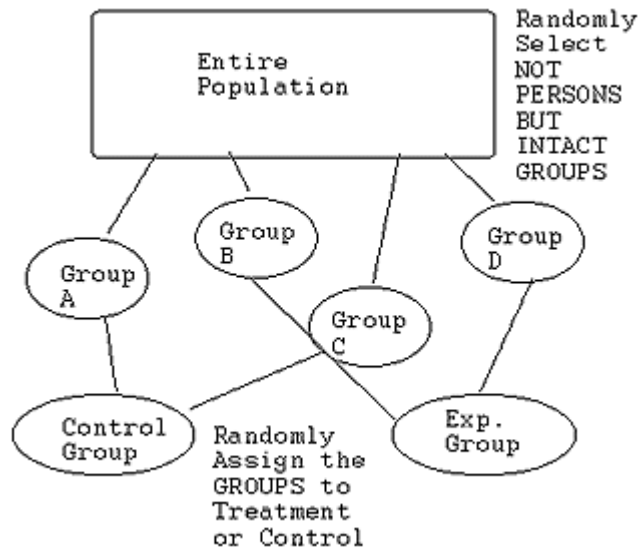
Ah...but ivory-tower research is one thing; real life quite another !

What if you get the OK to do your research within a school district, but the sup't. says, "Oh no! I can't let you be disrupting our bureaucratic organization here and "making your own 4th grade classrooms" for your study! That's way too disruptive! No, no, the best you can do is to randomly select INTACT existing 4th grade classrooms and then go ahead and use all the kids in those randomly drawn GROUPS instead!"

The True Experiment and Quasi-Experiment

Which brings us to the 2nd variant of "experimental designs:"

B. **Quasi-experimental** - **what you are 'randomly drawing' (selecting) is NOT INDIVIDUALS but INTACT (pre-existing) GROUPS!** These could be existing classrooms, clinics, vocational education centers, etc. In other words, you "lose" the power to "make your own groups" for your study!



Here (for the quasi-experiment), you randomly draw intact groups (e.g., from all the 4th grades in the district, you draw 4 of them at random) and then flip a coin or use some other random procedure to assign the pre-existing 4th grades to either the "treatment" or "control" conditions. (In our example Grades A and C "land" in the traditional lecture method (control), while Grades B and D end up in the hands-on science instruction (e.g., the "treatment" or the "experimental" group).

Do you see how this is different from the "true" experiment? In the "true" experiment, you selected the children themselves (subjects) at random and then "had the power" to in essence "form" your own "4th grades" by assigning the individual kids themselves randomly to either the control or the experimental conditions.

Here, though, the 'best you can do' (again, often for practical reasons such as access to sites, permission, etc.) is draw not individual kids but the GROUPS themselves (pre-existing 4th grade classrooms) at random and then in step # 2 assigning NOT the INDIVIDUAL KIDS but rather the WHOLE GROUPS to either the treatment or control conditions.

Quasi-Experimental Design

See how **this one-step loss of randomization may mean a bit less control over those pesky contaminants?**! By forming your own groups you have a greater likelihood of "getting a good mix on all other stuff". But here, you've got to "live with the existing groups as is." And suppose that in the above scenario, 4th Grades B & D also happen (quite by accident, but welcome to 'real life!') to have a higher average I.Q. of 15 points than A & B! Now we've got a contaminant! Did the kids do better because of the hands-on science lesson -- or because of their inherently higher aptitude, intelligence or whatever?!

But at least we still have that last step: random assignment to either the experimental or control conditions!

Remember ... again...

1. For true experiments, we're randomly assigning individuals to treatment vs. control; and
2. For quasi-experiments, we're randomly assigning intact/pre-existing groups to treatment vs. control.

Well -- we lose that "random assignment" property in the 3rd "family" of group comparison design methodologies!

Ex post facto (also called "causal comparative") - really no 'random anything!' We identify some sort of outcome and wonder 'what makes it vary like that?' Could it be some pre-existing grouping? For instance, if we 'divided' or 'pile-sorted' the responses by gender, would that account for the difference we see?

Thus, there is no treatment either! Simply an attempt to see if a grouping that we had no prior control over seems to "make a difference" on some outcome(s)!

The keyword "difference" (by grouping) and no treatment would be the tip-off to an ex post facto or causal-comparative study design.

And -- regarding the grouping -- maybe this rather silly example will make the point! And help you to identify if you are in such a situation of "no-control-over-grouping:"

You wish to study whether preschoolers from single-parent homes are different in terms of emotional readiness for kindergarten than those of two-parent homes.

Now ... you couldn't go to prospective subjects' homes and say, "OK, now you've got to get divorced ... and YOU have to stay married ... 'cuz that's how you came up in the random assignment!"

I don't think so...!!! Same thing with "gender:" you took it "as is" (e.g., those subjects in essence 'self-selected into their gender grouping). You had no prior control over 'making' them 'be' one gender or the other but rather took those groups 'as is' and kind of pile-sorted some response(s) by gender to see if it 'made a difference' on some outcome! Indeed ... the **literal Latin translation of "ex post facto" is "after the fact."** This shows YOUR role in the 'grouping' process as the researcher! You didn't 'assign' them into any one group, randomly or otherwise. Instead, you came in "after the fact" and wished to see if that self-determined grouping made a difference on some outcome(s) that you are studying!

As you can imagine -- even bigger problems with contaminating variables! There is no randomization or control here!

Thus the name "causal comparative" is sort of a misnomer. You are indeed "comparing" two or more "pre-formed" groups on some outcome(s). But due to that *lack of randomization and control*, you can't really use this design to study "cause/effect" types of research questions or problem statements. There are generally *too many uncontrolled, unrandomized contaminating variables* that may have entered the picture to confidently make 'strong' cause/effect statements!

Nonetheless, given the circumstances, this type of design might be "the best you can do." Group differences on some outcome(s) might indeed be interesting to study even though you had little or no "control" in the situation.

To summarize, for the "group comparison" family of designs:

Kind of Study	Method of Forming Groups
Ex Post Facto (Causal Comparative)	Groups Formed
True Experiment	Random Assignment of Individual to "Researcher-Made" Groups
Quazi-Experiment	Random Assignment of Intact Groups

Case study design

It is a useful tool for investigating trends and specific situations in many scientific disciplines, especially social science, psychology, anthropology and ecology

Basically, a case study is an in depth study of a particular situation rather than a sweeping statistical survey. It is a method used to narrow down a very broad field of research into one easily researchable topic

Though it does not answer a question completely, it gives some indications and allows further elaboration and hypothesis creation on a subject.

The case study research design is also useful for testing whether scientific theories and models actually work in the real world. You may come out with a great computer model for describing how the ecosystem of a rock pool works but it is only by trying it out on a real life pool that you can see if it is a realistic simulation.

For psychologists, anthropologists and social scientists they have been regarded as a valid method of research for many years. Scientists are sometimes guilty of becoming bogged down in the general picture and it is sometimes important to understand specific cases and ensure a more holistic approach to research.

Its advantage, (case study research design) is that you can focus on specific and interesting cases. This may be an attempt to test a theory with a typical case or it can be a specific topic that is of interest. Research should be thorough and note taking should be meticulous and systematic. In a case study, you are deliberately trying to isolate a small study group, one individual case or one particular population.

For example, statistical analysis may have shown that birthrates in African countries are increasing. A case study on one or two specific countries becomes a powerful and focused tool for determining the social and economic pressures driving this

How To Design And Conduct A Case Study

It is best if you make yourself a short list of 4 or 5 bullet points that you are going to try and address during the study. If you make sure that all research refers back to these then you will not be far wrong.

With a case study, even more than a questionnaire or survey, it is important to be passive in your research. You are much more of an observer than an experimenter and you must remember that, even in a multi-subject case, each case must be treated individually and then cross case conclusions can be drawn

How To Analyze The Results

Analyzing results for a case study tends to be more opinion based than statistical methods. The usual idea is to try and collate your data into a manageable form and construct a narrative around it.

Use examples in your narrative whilst keeping things concise and interesting. It is useful to show some numerical data but remember that you are only trying to judge trends and not analyze every last piece of data. Constantly refer back to your bullet points so that you do not lose focus.

It is always a good idea to assume that a person reading your research may not possess a lot of knowledge of the subject so try to write accordingly.

In addition, unlike a scientific study which deals **with facts**, a case study is based on **opinion** and is very much designed to provoke reasoned debate. There really is no right or wrong answer in a case study.

Cross-sectional design

A research design where **subjects are assessed at a single time** in their lives, A cross sectional study is fast and can study a large number of patients at little cost or effort. Also, you don't have to worry about patients dropping out during the course of the study. This study is efficient at identifying association, but may have trouble deciding cause and effect. With data at only one time point, you don't know whether the chicken or the egg came first. Here are two examples of cross sectional designs

In Zureik et al (BMJ 2002 Aug 24;325(7361):411), a group of 1132 adults with asthma were given respiratory function tests to assess the severity of their asthma. They were also given skin prick tests to assess their sensitization to mold, pollen, dust mites, and cats. In this study, those patients with reactions to mold were much more likely to have severe asthma.

Types Of Research

Research can also be classified on the basis of its purpose its intended to achieve and examples of such researches include:

Evaluative research:

This is the study that focuses on whether an intervention was properly implemented and whether the intended outcomes of a given programme or project have been realized or not.

(Mouton, 2001) Evaluation studies are both quantitative and qualitative in nature and it requires an understanding of the project objectives so that the performance of the project can be measured against the set objectives.

Predictive research

This type of research takes on several variables and tries to predict the likely outcome. It asks 'what if' questions. Thus it is based on predictions which themselves grow out of repeated actions and events which have been studied. It is based on probability and can be used to predict the likelihood of an event occurring (Wisker, 2001)

Historical research

These are studies which attempt to reconstruct the past and chronology of events (mouton 2001) and aim at arriving at an accurate account of the past so as to gain a better understanding of the present and forecast what the future is likely to be.

Historical research is also referred to as analytical research. Common methodological characteristics include a research topic that addresses past events, review of primary and secondary data, techniques of criticism for historical searches and evaluation of the information, and synthesis and explanation of findings. Historical studies attempt to provide information and understanding of past historical, legal, and policy

Meta-Analysis

Meta-analysis combines the results of studies being reviewed. It utilizes statistical techniques to estimate the strength of a given set of findings across many different studies. This allows the creation of a context from which future research can emerge and determine the reliability of a finding by examining results from many different studies. Researchers analyze the methods used in previous studies, and collectively quantify the findings of the studies. Meta-analysis findings form a basis for establishing new theories, models and concepts.

Thomas and Nelson (1990) detail the steps to meta-analysis:

1. Identification of the research problem.
2. Conduct of a literature review of identified studies to determine inclusion or exclusion.
3. A careful reading and evaluation to identify and code important study characteristics.
4. Calculation of effect size. Effect size is the mean of the experimental group minus the mean of the control group, divided by the standard deviation of the control group. The notion is to calculate the effect size across a number of studies to determine the relevance of the test, treatment, or method.
5. Reporting of the findings and conclusions.

Exploratory research:

These are studies intended to carry out preliminary investigation into relatively unknown areas of research (Terre Blanch and Durrheim). They employ open, flexible and inductive approach to research as they attempt to look for new insights into phenomena. They generate speculative insights, new questions and hypothesis. They ask both 'what and why' questions (Wiker, 2001, and Mbaaga, 1990) and this type of research is more flexible.

Descriptive research

Descriptive research are designed to gain more information about a particular characteristic within a particular field of study. A descriptive study may be used to, develop theory, identify problems with current practice, justify current practice, make judgements or identify what others in similar situations may be doing. There is no manipulation of variables and no attempt to establish causality. They are qualitative in nature and produce descriptive data i.e they use people's own written and spoken words as well as observable behaviour to describe a phenomenon or event so that it can be understood better.

- Descriptive research requires the clear specification of...

WHO, WHAT, WHEN, WHERE, WHY, and HOW

-- Before data collection can begin

- Exploratory research is very flexible; descriptive research is **MUCH** more rigid

Causal research

This is a type of research that tries to find out the cause and effect of phenomenon (Leedy, 1997). The possibility of causal inference derives from the use of randomization techniques, experimental and comparative groups and repeated measures over time. Thus it aims at establishing cause-effect relationships between the research variables.

Other classification of research

It may also be categorized into the following

- Quantitative versus qualitative research
- Basic versus applied research
- Empirical and non empirical research

Qualitative and Quantitative Research

Quantitative research is:

"a formal, objective, systematic process in which numerical data are utilized to obtain information about the world" (Burns and Grove cited by Cormack 1991 p 140). There is massive use of mathematics, statistical tools and the samples are comparatively large.

In general, qualitative research generates rich, detailed and valid (process) data that contribute to in-depth understanding of the context. Quantitative research generates reliable population based and generalizable data and is well suited to establishing cause-and-effect relationships

Quantitative research is research involving the use of structured questions where the response options have been predetermined and a large number of respondents is involved.

By definition, measurement must be objective, quantitative and statistically valid. Simply put, it's about numbers, objective hard data.

The sample size for a survey is calculated by statisticians using formulas to determine how large a sample size will be needed from a given population in order to achieve findings with an acceptable degree of accuracy. Generally, researchers seek sample sizes which yield findings with at least 95% confidence interval (which means that if you repeat the survey 100 times, 95 times out of a hundred, you would get the same response) and plus/minus 5 percentage points margin error. Many surveys are designed to produce smaller margin of error.

Qualitative Research is collecting, analyzing, and interpreting data by observing what people do and say. Whereas, quantitative research refers to counts and measures of things, qualitative research refers to the meanings, concepts, definitions, characteristics, metaphors, symbols, and descriptions of things.

Qualitative research is much more subjective than quantitative research and uses very different methods of collecting information, mainly individual, in-depth interviews and focus groups. The nature of this type of research is exploratory and open-ended. Small numbers of people are interviewed in-depth and/or a relatively small number of focus groups are conducted.

Participants are asked to respond to general questions and the interviewer or group moderator probes and explores their responses to identify and define people's perceptions, opinions and feelings about the topic or idea being discussed and to determine the degree of agreement that exists in the group. The quality of the finding from qualitative research is directly dependent upon the skills, experience and sensitive of the interviewer or group moderator.

This type of research is often less costly than surveys and is extremely effective in acquiring information about people's communications needs and their responses to and views about specific communications.

Basically, quantitative research is objective; qualitative is subjective. Quantitative research seeks explanatory laws; qualitative research aims at in-depth description. Qualitative research measures what it assumes to be a static reality in hopes of developing universal laws. Qualitative research is an exploration of what is assumed to be a dynamic reality. It does not claim that what is discovered in the process is universal, and thus, replicable. Common differences usually cited between these types of research include.

Characteristics of quantitative and qualitative research

Quantitative	Qualitative
Objective	Subjective
Research questions: How many? Strength of association?	Research questions: What? Why?
"Hard" science	"Soft" science
Literature review must be done early in study	Literature review may be done as study progresses or afterwards
Test theory	Develops theory
One reality: focus is concise and narrow	Multiple realities: focus is complex and broad
Facts are value-free and unbiased	Facts are value-laden and biased
Reduction, control, precision	Discovery, description, understanding, shared interpretation
Measurable	Interpretive
Mechanistic: parts equal the whole	Organismic: whole is greater than the parts
Report statistical analysis. Basic element of analysis is numbers	Report rich narrative, individual; interpretation. Basic element of analysis is words/ideas.
Researcher is separate	Researcher is part of process
Subjects	Participants
Context free	Context dependent
Hypothesis	Research questions
Reasoning is logistic and deductive	Reasoning is dialectic and inductive
Establishes relationships, causation	Describes meaning, discovery
Uses instruments	Uses communications and

	observation
Strives for generalization Generalizations leading to prediction, explanation, and understanding	Strives for uniqueness Patterns and theories developed for understanding
Highly controlled setting: experimental setting (outcome oriented)	Flexible approach: natural setting (process oriented)
Sample size: n	Sample size is not a concern; seeks "informal rich" sample
"Counts the beans"	Provides information as to "which beans are worth counting"

The decision of whether to choose a quantitative or a qualitative design is a philosophical question. Which methods to choose will depend on the nature of the project, the type of information needed the context of the study and the availability of resources (time, money, and human).

It is important to keep in mind that these are two different philosophies, not necessarily polar opposites. In fact, elements of both designs can be used together in mixed-methods studies. Combining of qualitative and quantitative research is becoming more and more common.

Every method is different line of sight directed toward the same point, observing social and symbolic reality. The use of multiple lines of sight is called triangulation.

It is a combination of two types of research. It is also called pluralistic research.

Advantages of combining both types of research include:

1. research development (one approach is used to inform the other, such as using qualitative research to develop an instrument to be used in quantitative research)
2. Increased validity (confirmation of results by means of different data sources)
3. Complementarity (adding information, i.e. words to numbers and vice versa)
4. Creating new lines of thinking by the emergence of fresh perspectives and contradictions.

Barriers to integration include philosophical differences, cost, inadequate training and publication bias.

Qualitative data analysis

Qualitative analysis involves a continual interplay between theory and analysis. In analyzing qualitative data, we seek to discover patterns such as changes over time or possible causal links between variables.

Examples of approaches to discovery and explanations of such patterns are Grounded Theory Method (GTM), semiotics, and conversation analysis.

Qualitative researchers sometimes attempt to establish theories on a purely inductive basis.

This approach begins with observations rather than hypothesis and seeks to discover patterns and develop theories.

Qualitative data Processing

The processing of qualitative data is as much art as science. Three key tools for preparing data for analysis *are coding, memoing, and concept mapping.*

Coding is classifying or categorizing individual pieces of data.

If you are testing hypothesis, then the codes could be suggested by the theory, in forms of variables. Open coding – codes are suggested by the researcher's examination and questioning of the data.

Example: 2 passages from Book Leviticus (Revised Standard version): religious bases for homophobia.

18:22 You shall not lie with male as with a woman, it is an abomination.

20:13 If a man lies with a male as with a woman, both of them have committed an abomination; they shall be put to death, their blood is upon them.

Homosexuality – key concept

Lying implies having sex

Male homosexuality

Prohibited behavior

Abomination

Put to Death

Male homosexuality is not the only abomination. Most of the abominations have to do with dietary rules and mishandling of ritual artifacts. **Thus, Dietary Rules and Ritual Artifacts are additional codes.**

Death penalty is broadly applied by Leviticus: everything from swearing to murder, including male homosexuality somewhere in between.

An extended analysis of prohibited behavior, short of abomination and death, and also turns up a lengthy list. Among them are slander, cursing the deaf, putting stumbling blocks in front of the blind people, and so forth.

Memoing writing memos or notes to yourself and others involved in the project. It is appropriate at several stages of data processing to capture code meaning, theoretical ideas, preliminary conclusions, and other thoughts that will be useful during analysis.

Concept mapping uses diagrams to explore relationships in the data graphically

Basic Research And Applied

Basic Research is experimental or theoretical work undertaken primarily to acquire new knowledge of the underlying foundation of phenomena and observable facts, without any particular application or use in view.

Applied research is also an original investigation undertaken to acquire new knowledge. It is, however, directed primarily towards a specific practical aim or objective.

Experimental development is systematic work, drawing on existing knowledge gained from research and/or practical experience that is directed to producing new materials, products or devices, to installing new processes, systems and services, or to improving substantially those already produced or installed."

Content In The Proposal

What follows is more information about what is required in the various sections of your evolving research proposal.

I. **The Problem.** You should begin by stating what the problem is that you are going to research. You should give the reader an idea of the project you intend to undertake.

II. **Importance to the Discipline.** Not every topic is worth researching. What should guide your choice of a topic is that it is important and relevant to the field in which you are engaged. You must convince the reader that your topic is important. It is here that you need to integrate some theory that supports the need to investigate your topic.

III. **Literature Review.** Your review should follow the introduction of the problem and should include a logically organized review of the relevant literature. You should give a summary of the theory that guides your work, as well as discuss what others have found who have done the same or similar research. If you are proposing to replicate someone else's work, you should say why. For example, do you wish to extend the generalizability of their findings, or are you

hoping to improve on their methodology? Tell why. There is no need for you to rediscover the wheel; therefore, be careful in your search of the literature.

List Questions/Hypotheses. Your review of the literature should lead you to your research questions. In other words, these questions should be a natural outgrowth of your review of others' work. State these questions concisely. Be clear about what you are going to try to prove or disprove. If the reader cannot understand what you are proposing, then you are not making a strong argument

Hypothesis: A statement that specifies how two or more measurable variables are related. e.g

(H1): Women are more likely than men to make impulse purchases of our brand.

(H2): Decreasing price by 10% will increase unit sales by 30%.

(H3): Adoption of our new product will be greater in Northern states than in Southern States.

IV. Method of Research. While there are various methods by which one can approach social research, there are certain parameters which must be taken into consideration and addressed in your proposal. If the parameter does not appear to be relevant to your proposed research, you must address why that may be the case. What follows below is a list of parameters which might be considered in the writing of a research proposal. During the course of the semester, we will address these and other components of a research proposal.

A. Operationalization of the Variables: If your question is "Is job security related to job satisfaction?" you must tell what you mean by both job security and job satisfaction, and be very specific. Will these concepts be measured by a response to a question? What is that specific question? If you are asking more than one question to capture a concept, will you form a scale measure? What kind of scale measure? Each variable must have specific operations (hence, operationalization) attached to it so that the reader knows exactly how the variable will be measured in the proposed research.

B. Design: Specify what research design your study will take, and why. Is it an experimental design? Will you look at one group once or on several different occasions? Will you look at more than one group? Will you be comparing different groups? Why? Will you use a case study approach?

C. Sample: How will you draw your sample? What is the method(s) you will employ? How many will be in your sample? Why? Will you use probability sampling or non-probability sampling? Why?

D. Data Gathering Method: How will you actually gather the data that measures your variables? Will you use a survey? Will you interview people? Will you use existing data? Which data? If you are using specific instruments, include copies of them in an appendix to the proposal. Will you use focus groups?

E. Ethical Considerations: What impact might your study have on your "subjects?" What risk, if any, might you impose on the population you study by conducting the research? What are some different ways in which the findings of your research might be utilized by others? Are there any possible political uses and what might be some implications of those uses? How your findings might be utilized differently from your research intentions?

F. Political Considerations : To what political ends might the findings of your research be used? It is important to be aware that one's findings, regardless of what was hypothesized, can be put to political use. If the costs of political use outweigh the benefits of the research (which is also true of ethical considerations), one must question whether to conduct the proposed research

G. Validity and Reliability: How will you know if you are measuring what you say you are measuring? How will you know if your data is valid? What checks for validity will you provide? Are your measuring tools reliable? How will you know if they are reliable? What will you do that will convince the reader that you have addressed validity and reliability?

H. Limitations to the Proposed Study: You should tell the reader some of the limitations you foresee for your study. If you are using a specific sample and this limits generalizability, you should say so. If you are testing a group that might change the effectiveness of your measuring instrument, you need to address it. Anything that might limit the knowledge gained, in any way, should be mentioned. None of us conduct the perfect research project; therefore, it is important that we address possible limitations.

V. Data Analysis: How do you propose to analyze the data you would collect from this proposed research? If you posit a relationship between some of the variables, how will you determine if there really is a relationship? What statistical techniques might you use? While you are not actually going to do any statistical analysis at this point, you must have an idea of what types of analyses would be appropriate for both your variables and your research questions.

VI. Reference List: Any of the studies you cite in the literature review, or any other relevant works that you use in the proposal, must be included in a proper reference list. (See Writing Guidelines) Note that a reference list should include only those items actually referenced in the body of the paper. If you do not use it in the body of the paper, you should not include it in the reference list.

VII. Appendices: You should attach a copy of any relevant supplemental materials, such as questionnaires, interview schedules, scoring keys (code sheets),.

Grading Points for Proposal Papers

Consider the following criteria used in grading to increase your skills in project proposal writing

GRADING: Stage 1 is worth 120 points. Stage 2 is worth 280 points and the next pages detail the grading criteria for each paper.

RESEARCH PROPOSAL – STAGE 1 – EVALUATION SHEET MECHANICS (10%) – 12 POINTS

1. Grammatical and spelling errors (possible 8 points): Average number of errors per page: 0 = 8 pts;

1 = 6 pts;

2-3 = 4 pts;

4-5 = 2 pts;

6-7 = 1 pts;

8 or more = 0 pts. _____

2. Follows required writing guidelines, including spacing, margins, and citation of sources. (4 points) _____

ORGANIZATION (30%) – 36 POINTS

1. Presents critical thought on the topic; i.e., does not merely provide Descriptions or lists. (12 points) _____

2. Shows evidence of careful, logical planning and presentation, with use of appropriate headings throughout proposal. (12 points) _____

3. Shows evidence of careful writing, with clear articulate use of language. (12 points)

CONTENT (60%) – 72 POINTS

1. Statement of the problem that clearly describes the topic that is being proposed for research. (10 points) _____
2. Demonstrates the importance of the topic for research and for the respective discipline. (10 points) _____
3. Integrates scholarly material and own ideas in the development and discussion of the topic. (25 points) _____
4. Uses scholarly references and shows a clear link to the existing professional literature and relevant theory. (12 points) _____
5. Poses appropriate and clear research questions/hypotheses. (15 pts)

The following are the methods of data collection

Observation method

Observational research is used for studying nonverbal behaviors (gestures, activities, social groupings, etc).

Sommer & Sommer (1986) developed the list shown below to assist in observation research.

1. Specify the question(s) of interest (reason for doing the study).
2. Are the observational categories clearly described? What is being observed and why?
3. Design the measurement instruments (checklists, categories, coding systems, etc.).
4. Is the study designed so that it will be 'Valid (i.e., does it measure what it is supposed to measure, and does it have some generalizability)?
5. Train observers in the use of the instruments and how to conduct observational research.
6. Do a pilot test to (a) test the actual observation procedure and (b) check the reliability of the categories of observation using at least two independent observers.
7. Revise the procedure and instruments in light of the pilot test results. If substantial changes are made to the instrument, run another pilot test to make sure changes will work under the field conditions.
8. Collect, compile, and analyze the data and interpret results.

Casual observation is normally done like unstructured interviews. During the early stages of a research project, casual observation allows the researcher(s) to observe subjects prior to designing questionnaires and/or interview formats.

Types of Observation Studies

Ethnographies which are observations of groups

Grounded theory which uses multi-staged data collection Phenomenological studies which studying subjects over a period of time through developing relationships with them and reporting findings based on research “experiences”.

Case studies which use various data to investigate the subject over time and by activity

Each research method has its strengths and weaknesses. When designing a research study it is important to decide what the outcome (data) the study will produce then select the best methodology to produce that desired information.

SURVEY: This is the method used to describe a method of gathering information from a sample of individuals in a population in order to learn something about the larger population from which the sample is drawn.

Types of surveys: descriptive statistics which is largely conducted by the government to obtain major descriptive information about the population and its density, the composition of the labor force, national health statistics etc.

Survey for social research: mainly used by social scientists to gather and analyze information about the social and economic conditions of the population or segments of the population and leads to the better understanding of human beings in their social settings.

Market research survey: this is carried on by business in consumer market research to determine consumer needs and the effectiveness of marketing programs.

The Steps In A Survey Project

1. Establish the goals of the project or what you want to learn
2. Determine your sample –whom you will interview
3. Choose interviewing methodology-how you will interview
4. Create your questionnaire –what you ask
5. Pretest the questionnaire, if practical test the questions
6. conduct interviews and enter data
7. Analyse the data and produce the report

Interviews; this may be defined as a deliberate conversation between the interviewer and an informant conducted for the purpose of collecting information. It may take the form of face to face interview schedule or telephone survey by Mbaaga (Ibid.). it may be formal or informal interview

Formal interview: this type involves the pre determined list of questions that are asked to all the interviewees in the same order. They may be structured with standardized questions or semi-structured with some degree of flexibility and the more structured the interview, the easier it is to quantify the results.

Group Interview: (Focus Group Discussion) FGD

Richard Krueger (1988), describe the focus group as a special type of group in terms of purpose, size, composition, and procedures. A focus group is typically composed of seven to twelve participants who are unfamiliar with each other and conducted by a trained interviewer. These participants are selected because they have certain characteristics in common that relate to the topic of the focus group.

The researcher creates a permissive environment in the focus group that nurtures different perceptions and points of view, without pressuring participants to vote, plan, or reach consensus. The group discussion is conducted several times with similar types of participants to identify trends and patterns in perceptions. Careful and systematic analyses of the discussions provide clues and insights as to how a product, service, or opportunity is perceived.

A focus group can be defined as a carefully planned discussion designed to obtain perceptions on a defined area of interest in a permissive, non threatening environment. It is conducted with approximately seven to twelve people by a skilled interviewer. The discussion is relaxed, comfortable, and often enjoyable for participants as they share their ideas and perceptions. Group members influence each other by responding to ideas and comments in the discussion.

Characteristics Of Focus Groups

Focus group interviews typically have four characteristics:

1. Identify the target market (people who possess certain characteristics);
2. Provide a short introduction and background on the issue to be discussed;
3. Have focus group members write their responses to the issue(s);
4. Facilitate group discussion;
5. Provide a summary of the focus group issues at the end of the meeting.

Other types of group processes used in human services (delphic, nominal, planning, therapeutic, sensitivity, or advisory) may have one or more of these features, but not in the same combination as those of focus group interviews.

Key Data Collection Techniques

Face to Face or personal interviews

Telephone interviews

Mail / postal interviews

E-mail interviews

Internet/ intranet (WEB PAGE)

How ever the above techniques may have advantages and disadvantages

The above techniques may be applied using a questionnaire,

Questionnaire: Is a predetermined written list of questions, which may be answered, by a subject or respondent.

The type of population, the nature of the research question and resources available determines the type of questionnaire to be used.

Planning the Survey

I. Hypotheses

- Descriptive hypotheses best answered by this method
- If you don't consider your hypotheses before writing your survey, you may be Overwhelmed with data and End up with data that doesn't address your concerns
- Good to go through several different scenarios of outcome from survey to see whether different outcomes would indeed have different implications for: Your hypotheses and What action you will take (if survey is to address applied issue)

II. After determining precisely what you want to find out, determine who you want to ask

A. Defining your population

B. Determining whether to use the population or to sample

C. Types of samples

1. Convenience samples

2. Quota samples

3. Random samples: Allow you to use inferential statistics to determine how closely your results reflect their population

4. Stratified random samples: The advantage of random samples, but with a smaller sample and/or greater accuracy

III. Questionnaire, Interview, or Telephone Survey?

A. Issues to consider

1. Cost

2. Response rate

3. Honesty of responses

4. Standardization

B. The case for the telephone survey

IV. Format issues:

A. Format of questions

1. Dichotomous versus continuous

2. Fixed versus open-ended

B. Format of survey

1. Structured
2. Semi-structured
3. Unstructured

C. Why a novice might be better off with fixed alternative questions and a structured survey:

1. Data is easily coded
2. Structure may reduce investigator bias: Data on hypothesis-confirming bias (Snyder, 1984, Snyder, 1981, Snyder and Cantor, 1979)

V. Rules for asking good questions

- A. Use words a third-grader would understand
- B. Use words that won't be misinterpreted
- C. Avoid personal questions
- D. Make sure your sample has the information you seek
- E. Avoid leading questions
- F. Avoid questions loaded with social-desirability
- G. Avoid double-barreled questions negation
- H. Keep questions short and concise
- I. Avoid negations barrel
- J. Avoid irrelevant questions
- K. Pretest the questions

VI. Analyzing survey data

- A. Summarizing data
- B. Summarizing interval data
- C. Summarizing ordinal or nominal data
- D. Using inferential statistics
 1. Parameter estimation with interval data
 2. Hypothesis testing with interval data
 - a. Relationships among more than two variables
 - b. More complicated procedures
- E. Using inferential statistics with nominal data
 1. Estimating overall percentages in population
 2. Relationships between variables

A. Literature review

1. To avoid doing a study that has already been done
2. To learn from others' mistakes and successes

B. Ethical concerns

1. Assessing potential gain:
 - Is it a test of theory?
 - Does it address a practical problem?
 - Does it open up new lines of inquiry?
 - Be sure you're **not** trying to prove the null hypothesis or unwittingly replicating a study that has been done before.
 - Peer review
2. Assessing potential harm:
 - Are ethical principles compromised?
 - Peer review
 - Review by professor
 - Review by ethics committee

- Practical concerns

Should scientific principles be used to study humans and other animals?

Only if:

A. The potential benefits exceed the potential harm.

B. The potential for harm has been minimized

II. Maximizing benefits

A. Getting a good, useful idea to test.

B. Providing a valid test of that idea. The study should have at least one of the following three types of validity. The type or types needed depend on the research question.

Documentary Analysis

This is also known as the study of documents where documents are the materials which contain the information we wish to study. It is important to note that all studies begin by a review of related literature and certain documents; this may become a method of data collection if the research based on available documents.

Documents are divided into two broad categories namely primary (eye witness account written by people who experienced the particular event or behavior) and secondary documents (accounts written by those who were not present during the event but received the necessary information for compiling the documents by interviewing the eyewitnesses or reading the primary documents.

Primary documents may include things like letters, agendas, committee minutes, financial accounts and diaries. Secondary documents may include things like books, newspapers, journals articles etc.

Forms of documentary Analysis: Historical, Literature, Meta-Analysis Diaries and Content Analysis

Content Analysis

Content analysis systematically describes the form or content of written and/or spoken material. It is used to quantitatively studying mass media. The technique uses secondary data and is considered unobtrusive research.

The first step is to select the media to be studied and the research topic. Then develop a classification system to record the information. The techniques can use trained judges or a computer program can be used to sort the data to increase the reliability of the process.

Content analysis is a tedious process due to the requirement that each data source be analyzed along a number of dimensions. It may also be inductive (identifies themes and patterns) or deductive (quantifies frequencies of data). The results are descriptive, but will also indicate trends or issues of interest.

Experimental Designs

1. True Designs
2. Quasi Designs
3. Ex Post Facto Designs

True Designs - Five Basic Steps to Experimental Research Design

1. Survey the literature for current research related to your study.
2. Define the problem, formulate a hypothesis, define basic terms and variables, and operationalize variables.
3. Develop a research plan:
 - a. Identify confounding/mediating variables that may contaminate the experiment, and develop methods to control or minimize them.
 - b. Select a research design as seen already above

- c. Randomly select subjects and randomly assign them to groups.
 - d. Validate all instruments used.
 - e. Develop data collection procedures, conduct a pilot study, and refine the instrument.
 - f. State the null and alternative hypotheses and set the statistical significance level of the study.
4. Conduct the research experiment(s).
 5. Analyze all data, conduct appropriate statistical tests and report results.

Quasi Designs

The primary difference between true designs and quasi designs is that quasi designs do not use random assignment into treatment or control groups since this design is used in existing naturally occurring settings.

Groups are given pretests, then one group is given a treatment and then both groups are given a post-test. This creates a continuous question of internal and external validity, since the subjects are self-selected. The steps used in a quasi design are the same as true designs.

Ex Post Facto Designs

An ex post facto design will determine which variables discriminate between subject groups.

Steps in an Ex Post Facto Design

1. Formulate the research problem including identification of factors that may influence dependent variable(s).
2. Identify alternate hypotheses that may explain the relationships.
3. Identify and select subject groups.
4. Collect and analyze data

Ex post facto studies cannot prove causation, but may provide insight into understanding of phenomenon.

Data Analysis

The data collected in a given research can be analyzed either qualitatively or quantitatively depending on the nature of the data collected. In analysing the data, you need to develop skills in finding patterns in the data and to have the ability to isolate critical facts and information from other information that is not so important. Although the analysis depends on the type of data collected, how the data collected depends on the type analysis anticipated.

Qualitative Data Analysis

Its normally analyzed continuously during and after data collection (Mbaaga 1990). The analysis involves a pure description of events, places, people or objects. This will enable the reader to know what happened, what it was like from the participant's activities etc. In most cases qualitative analysis does not go beyond the measure of central tendency and measure of dispersion (mean, mode, median, range, and standard deviation)

Thus the analysis takes place simultaneously during and after the data collection (Merriam et al 1995), this enables the researcher to make adjustments, restructure and if possible examine emerging concepts not originally in the study design.

How ever NVivo 8 is a software package for analysis of qualitative data, such as transcripts of in-depth interviews, focus groups and field notes.

Quantitative Data Analysis

This type of data can be analyzed by use of statistical procedures after the researcher has measured the relevant variables. The first step in quantitative data analysis is to prepare the raw data and transform them into a data set in machine readable format (in a form that can be read by a computer

Raw data is a collection of unprocessed measurements such as pile of completed questionnaires, strings of numerical codes applied to written texts etc these are then transformed into ordered data set before they can be analysed. The data preparation process involves three important tasks namely;

- Coding
- Entering and
- creating

Coding where the data is grouped into certain categories and assigned specific codes and process involves translating verbal responses into numerical codes that facilitates data manipulation. Then after the data is coded it is entered into computer for analysis using the appropriate statistical package. However before the analysis, data has to be cleaned i.e the information has to be edited or cross checked for errors if good results are to be expected and Following data entry, some data manipulation is usually needed to manipulate the entered ("raw") data into structures that are suitable for analysis. Typically, data manipulation tasks include

- *Copying data*
- *Selecting subsets of the data*
- *Restructuring the data to make analysis easier*
- *Transforming data*
- *Merging data at different levels*

Copying data

To avoid confusing the entry and the management, we suggest that you copy the raw data to a second sheet. This is easily done in Excel by creating a new worksheet (Insert => Worksheet), using Edit => Copy to copy the original data to the clipboard, and then Edit => Paste Special (rather than Paste) and clicking the Paste Link button. This ensures that the data in the new sheet are linked to the original data, so that any subsequent changes to the original are reflected automatically in the copy.

It is a good idea to get into the habit of [naming sheets](#). In general your analysis will be simpler to follow if you use more sheets, rather than putting all your information together in a few sheets. But you then need to give them meaningful names so you can easily find them and retrieve the information that you want.

Also, you can take advantage of Excel's facility for naming cells or areas of cells (Insert => Name => Define). This makes it much easier to refer to your data, rather than using cell addresses.

Selecting subsets of the data

It is often useful to look at subsets of the cases (rows) in your data, for example to concentrate on female subjects, or on cases that show abnormally large values for a particular variable. Excel has some excellent filtering facilities for selecting rows of interest, in particular the automatic filter (Data => Filter => Autofilter). This allows you to display only those rows containing particular values of one or more variables. By using the Custom option, you can specify up to two specific criteria for each variable. All rows that do not meet the criteria are hidden from view (but are not deleted). More complex filtering can be achieved using the Advanced Filter facility (Data => Filter => Advanced Filter), but this is more difficult to use.

Restructuring data

It is often necessary to extract some of the data and convert them to a different structure. The most common requirement is to split a data column into several columns, one for each level of a factor (or combination of factors). For example, we may wish to separate data for males and females, so that we can process them separately or compare them.

We call this process "unstacking", since in list format the data for a variable are held in a single column for all levels of a factor (i.e. stacked on top of each other).

Transforming data

You will commonly need to perform some transformations of the original data (for example, taking logarithms or converting from grammes per plot to tonnes per hectare). This is easily achieved by adding a new column to a copy of the data, and using a suitable Excel formula to transform the data contained in an existing column. The need to add new columns to your data is one of the reasons that we recommend taking a copy of your original data.

Merging data at different levels

When you have data at multiple levels, you may wish to incorporate data about one level in the data at a more detailed level. For example, records about individuals may contain an indication of which household they belong to. You may wish to add some details about the households to the individual data.

This can be achieved using the Excel lookup function. For each column of household information that you want to incorporate, you should create a new column in the individual table and use lookup to extract the appropriate information from the household data for each individual.

The analysis can be done at three levels depending on the investigation of the study namely;

At univariate level of Analysis: frequency tables to provide an enumeration of activity of people that have pre-specified characteristic. Percentages can also be presented so as to show the distribution of people that have certain characteristics within the total population of the study.

Suitable aids to visualizing your data fall generally into the following categories:

Graphics, which give a picture of the structure of your data and the relationships within them
Tables, which enable you to compare values, frequency counts, etc between levels of factors.
 Other univariate descriptive statistics include measures central tendency (e.g. mean, median, mode),deciles, quartiles and measures of dispersion(e.g. ,range, mean deviation, standard deviation, coefficient of variation).

At The Bivariate this involves making contingency tables between the dependent variable and the independent (explanatory variables). In order to establish relationship between the independent and the dependent variable Pearson -chi square test statistics can be used to measure the degree of association.

At multivariate can be used to carry out further investigation to establish the relative importance of the dependent variable.

NB programs we teach most statistical packages used in analysis like SPSS, STATA

Difference Between Research Proposal And Project Proposal

A research proposal	A project proposal
Exclusively written by academics and students in institutions of higher learning	Not restricted to academics
Review of related literature is emphasized	Literature review section is absent
Focuses on collecting data on a problem which will be analyzed for drawing conclusion and making recommendation	Makes use of the recommendations of a study to solve the problems of a given community
Bibliography and references are a must	Bibliography and reference may not be necessary

May be written and presented in chapters	Written and presented in sections
Proposals especially written by students may not necessarily be presented to seek financial assistance	The primary aim is to seek financial assistance
May not need a follow up action	Emphasizes a follow up action
Evaluation plan not necessary	Evaluation plan a must

The structure of a research report

- **Title**
- **Table of content**
- **An abstract**
- **Chapter one: Background to the problem**
- **Chapter two: Literature review**
- **Chapter three: Methodology**
- **Chapter four : Results /findings of the study**
- **Chapter five: Discussion, Conclusion and Recommendations**
- **References**
- **Appendices**
 - Timetable
 - Budget
 - Research instruments
 - Field photographs
 - Introduction letters
 - Any other important document

Appendix

WRITING UP RESEARCH

This is how method fits into your thesis:

☐	Introduction: introduction of research problem introduction of objectives introduction of how objectives will be achieved (methodology), optional introduction of main findings and conclusions, optional
☐	Literature review: review of previous work relating to research problem (to define, explain, justify) review of previous work relating to methodology (to define, explain, justify) review of previous work relating to results (particularly reliability, etc.) i.e identify weaknesses and success
☐	Method (how the results were achieved): explanation of how data was collected/generated · explanation of how data was analyzed explanation of methodological problems and their solutions or effects
☐	Results and discussion: presentation of results interpretation of results discussion of results (e.g. comparison with results in previous research, effects of methods used on the data obtained)
☐	Conclusions: has the research problem been “solved”? to what extent have the objectives been achieved? what has been learnt from the results? how can this knowledge be used? what are the shortcomings of the research, or the research methodology? etc.
☐	analysis: classes of data are collected and studies conducted to discern patterns and formulate principles that might guide future action
☐	Case study: the background, development, current conditions and environmental interactions of one or more individuals, groups, communities, businesses or institutions is observed, recorded and analyzed for stages of patterns in relation to internal and external influences.
☐	Comparison: two or more existing situations are studied to determine their similarities and differences.
☐	Correlation-prediction: statistically significant correlation coefficients between and among

	a number of factors are sought and interpreted.
☐	Evaluation: research to determine whether a program or project followed the prescribed procedures and achieved the stated outcomes.
☐	Design-demonstration: new systems or programs are constructed, tested and evaluated
☐	Experiment: one or more variables are manipulated and the results analyzed.
☐	Survey-questionnaire: behaviors, beliefs and observations of specific groups are identified, reported and interpreted.
☐	Status: a representative or selected sample of one or more phenomena is examined to determine its special characteristics.
☐	Theory construction: an attempt to find or describe principles that explain how things work the way they do.
☐	Trend analysis: predicting or forecasting the future direction of events
	Descriptive narration tells the story from beginning to end in chronological order, utilizing limited generalizations and synthesized facts.
	Interpretive analysis relates one event to another event. The event is studied and described within a broader context to add meaning and credibility to the data. For example, an examination of the development of a local jurisdiction's ability to dedicate land for parks may be related to the urbanization and loss of open space in our communities.
	Comparative analysis examines similarities and differences in events during different time periods-for example, the budget-cutting priorities and procedures of the Proposition 13 era of the early 1980s in parks and recreation as compared to the budget-cutting priorities and procedures of today
	Theoretical and philosophical analysis utilizes historical parallels, past trends, and sequences of events to suggest the past, present, and future of the topic being researched. Findings would be used to develop a theory . For example, an analysis of public recreation agency goals and objectives of previous eras can be used to describe the future in the context of social, political, economic, technological, and cultural changes in society.

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