

## Chapter 1 : Research methods : concepts and connections - JH Libraries

*Basic Concepts of Research Methodology* Research in common parlance refers to a search for knowledge. One can also define research as a scientific and systematic search for pertinent information on a specific topic.

Artistic research[ edit ] The controversial trend of artistic teaching becoming more academics-oriented is leading to artistic research being accepted as the primary mode of enquiry in art as in the case of other disciplines. As such, it is similar to the social sciences in using qualitative research and intersubjectivity as tools to apply measurement and critical analysis. It is based on artistic practices, methods, and criticality. Through presented documentation, the insights gained shall be placed in a context. This may be factual, historical, or background research. Background research could include, for example, geographical or procedural research. Patricia Leavy addresses eight arts-based research ABR genres: Documentary research Steps in conducting research[ edit ] Research is often conducted using the hourglass model structure of research. The major steps in conducting research are: Often, a literature review is conducted in a given subject area before a research question is identified. A gap in the current literature, as identified by a researcher, then engenders a research question. The research question may be parallel to the hypothesis. The hypothesis is the supposition to be tested. The researcher s collects data to test the hypothesis. The researcher s then analyzes and interprets the data via a variety of statistical methods, engaging in what is known as empirical research. The results of the data analysis in rejecting or failing to reject the null hypothesis are then reported and evaluated. At the end, the researcher may discuss avenues for further research. However, some researchers advocate for the reverse approach: The reverse approach is justified by the transactional nature of the research endeavor where research inquiry, research questions, research method, relevant research literature, and so on are not fully known until the findings have fully emerged and been interpreted. Rudolph Rummel says, " It is only when a range of tests are consistent over many kinds of data, researchers, and methods can one have confidence in the results. Maurice Hilleman is credited with saving more lives than any other scientist of the 20th century. This process takes three main forms although, as previously discussed, the boundaries between them may be obscure: Exploratory research , which helps to identify and define a problem or question. Constructive research , which tests theories and proposes solutions to a problem or question. Empirical research , which tests the feasibility of a solution using empirical evidence. There are two major types of empirical research design: Researchers choose qualitative or quantitative methods according to the nature of the research topic they want to investigate and the research questions they aim to answer: Qualitative research This involves understanding human behavior and the reasons that govern such behavior, by asking a broad question, collecting data in the form of words, images, video etc that is analyzed, and searching for themes. This type of research aims to investigate a question without attempting to quantifiably measure variables or look to potential relationships between variables. It is viewed as more restrictive in testing hypotheses because it can be expensive and time-consuming and typically limited to a single set of research subjects. Quantitative research This involves systematic empirical investigation of quantitative properties and phenomena and their relationships, by asking a narrow question and collecting numerical data to analyze it utilizing statistical methods. The quantitative research designs are experimental, correlational, and survey or descriptive. Quantitative research is linked with the philosophical and theoretical stance of positivism. The quantitative data collection methods rely on random sampling and structured data collection instruments that fit diverse experiences into predetermined response categories. If the research question is about people, participants may be randomly assigned to different treatments this is the only way that a quantitative study can be considered a true experiment. If the intent is to generalize from the research participants to a larger population, the researcher will employ probability sampling to select participants. Primary data is data collected specifically for the research, such as through interviews or questionnaires. Secondary data is data that already exists, such as census data, which can be re-used for the research. It is good ethical research practice to use secondary data wherever possible. For example, a researcher may choose to conduct a qualitative study and follow it up with a quantitative study to gain additional insights. As such, non-empirical research seeks solutions to problems

using existing knowledge as its source. This, however, does not mean that new ideas and innovations cannot be found within the pool of existing and established knowledge. Non-empirical research is not an absolute alternative to empirical research because they may be used together to strengthen a research approach. Neither one is less effective than the other since they have their particular purpose in science. Typically empirical research produces observations that need to be explained; then theoretical research tries to explain them, and in so doing generates empirically testable hypotheses; these hypotheses are then tested empirically, giving more observations that may need further explanation; and so on. A simple example of a non-empirical task is the prototyping of a new drug using a differentiated application of existing knowledge; another is the development of a business process in the form of a flow chart and texts where all the ingredients are from established knowledge. Much of cosmological research is theoretical in nature. Mathematics research does not rely on externally available data; rather, it seeks to prove theorems about mathematical objects.

**Research ethics**[ edit ] Research ethics involves the application of fundamental ethical principles to a variety of topics involving research, including scientific research. These principles include deontology , consequentialism , virtue ethics and value ethics. Ethical issues may arise in the design and implementation of research involving human experimentation or animal experimentation , such as: Research ethics is most developed as a concept in medical research. The key agreement here is the Declaration of Helsinki. The Nuremberg Code is a former agreement, but with many still important notes. Research in the social sciences presents a different set of issues than those in medical research [44] and can involve issues of researcher and participant safety, empowerment and access to justice. The increasing participation of indigenous peoples as researchers has brought increased attention to the lacuna in culturally-sensitive methods of data collection. As the great majority of mainstream academic journals are written in English, multilingual periphery scholars often must translate their work to be accepted to elite Western-dominated journals. Please update this article to reflect recent events or newly available information. May Peer review is a form of self-regulation by qualified members of a profession within the relevant field. Peer review methods are employed to maintain standards of quality, improve performance, and provide credibility. Usually, the peer review process involves experts in the same field who are consulted by editors to give a review of the scholarly works produced by a colleague of theirs from an unbiased and impartial point of view, and this is usually done free of charge. The tradition of peer reviews being done for free has however brought many pitfalls which are also indicative of why most peer reviewers decline many invitations to review. Influence of the open-access movement[ edit ] The open access movement assumes that all information generally deemed useful should be free and belongs to a "public domain", that of "humanity". For instance, most indigenous communities consider that access to certain information proper to the group should be determined by relationships. On the one hand, "digital right management" used to restrict access to personal information on social networking platforms is celebrated as a protection of privacy, while simultaneously when similar functions are used by cultural groups i. This could be due to changes in funding for research both in the East and the West. Focussed on emphasizing educational achievement, East Asian cultures, mainly in China and South Korea, have encouraged the increase of funding for research expansion. Professionalisation [ edit ] The examples and perspective in this section may not represent a worldwide view of the subject. You may improve this article , discuss the issue on the talk page , or create a new article , as appropriate.

**Chapter 2 : Research Methods**

*Research is the systematic and objective analysis and recording of controlled observations that may lead to the development of generalizations, principles, or theories, resulting in prediction and possible control of events.*

Basic concepts of Hypothesis testing Basic concepts in the context of testing of hypotheses need to be explained. Null hypothesis and alternative hypothesis: In the context of statistical analysis, we often talk about null hypothesis and alternative hypothesis. If we are to compare method A with method B about its superiority and if we proceed on the assumption that both methods are equally good, then this assumption is termed as the null hypothesis. As against this, we may think that the method A is superior or the method B is inferior, we are then stating what is termed as alternative hypothesis. The null hypothesis is generally symbolized as  $H_0$  and the alternative hypothesis as  $H_a$ . Then we would say that the null hypothesis is that the population mean is equal to the hypothesized mean and symbolically we can express as: If our sample results do not support this null hypothesis, we should conclude that something else is true. What we conclude rejecting the null hypothesis is known as alternative hypothesis. In other words, the set of alternatives to the null hypothesis is referred to as the alternative hypothesis. If we accept  $H_0$ , then we are rejecting  $H_a$  and if we reject  $H_0$ , then we are accepting  $H_a$ . The null hypothesis and the alternative hypothesis are chosen before the sample is drawn the researcher must avoid the error of deriving hypotheses from the data that he collects and then testing the hypotheses from the same data. In the choice of null hypothesis, the following considerations are usually kept in view: Alternative hypothesis is usually the one which one wishes to prove and the null hypothesis is the one which one wishes to disprove. Thus, a null hypothesis represents the hypothesis we are trying to reject, and alternative hypothesis represents all other possibilities. If the rejection of a certain hypothesis when it is actually true involves great risk, it is taken as null hypothesis because then the probability of rejecting it when it is true is a the level of significance which is chosen very small. Null hypothesis should always be specific hypothesis i. Generally, in hypothesis testing we proceed on the basis of null hypothesis, keeping the alternative hypothesis in view. The answer is that on the assumption that null hypothesis is true, one can assign the probabilities to different possible sample results, but this cannot be done if we proceed with the alternative hypothesis. Hence the use of null hypothesis at times also known as statistical hypothesis is quite frequent. The level of significance: This is a very important concept in the context of hypothesis testing. In case we take the significance level at 5 per cent, then this implies that  $H_0$  will be rejected when the sampling result i. In other words, the 5 per cent level of significance means that researcher is willing to take as much as a 5 per cent risk of rejecting the null hypothesis when it  $H_0$  happens to be true. Thus the significance level is the maximum value of the probability of rejecting  $H_0$  when it is true and is usually determined in advance before testing the hypothesis. Decision rule or test of hypothesis: Given a hypothesis  $H_0$  and an alternative hypothesis  $H_a$ , we make a rule which is known as decision rule according to which we accept  $H_0$  i. For instance, if  $H_0$  is that a certain lot is good there are very few defective items in it against  $H_a$  that the lot is not good there are too many defective items in it , then we must decide the number of items to be tested and the criterion for accepting or rejecting the hypothesis. We might test 10 items in the lot and plan our decision saying that if there are none or only 1 defective item among the 10, we will accept  $H_0$  otherwise we will reject  $H_0$  or accept  $H_a$ . This sort of basis is known as decision rule. Type I and Type II errors: In the context of testing of hypotheses, there are basically two types of errors we can make. We may reject  $H_0$  when  $H_0$  is true and we may accept  $H_0$  when in fact  $H_0$  is not true. In other words, Type I error means rejection of hypothesis which should have been accepted and Type II error means accepting the hypothesis which should have been rejected. Type I error is denoted by  $\alpha$  known as  $\alpha$  error, also called the level of significance of test; and Type II error is denoted by  $\beta$  known as  $\beta$  error. In a tabular form the said two errors can be presented as follows: The probability of Type I error is usually determined in advance and is understood as the level of significance of testing the hypothesis. If type I error is fixed at 5 per cent, it means that there are about 5 chances in that we will reject  $H_0$  when  $H_0$  is true. We can control Type I error just by fixing it at a lower level. For instance, if we fix it at 1 per cent, we will say that the maximum probability of committing Type I

error would only be 0. But with a fixed sample size,  $n$ , when we try to reduce Type I error, the probability of committing Type II error increases. Both types of errors cannot be reduced simultaneously. There is a trade-off between two types of errors which means that the probability of making one type of error can only be reduced if we are willing to increase the probability of making the other type of error. To deal with this trade-off in business situations, decision-makers decide the appropriate level of Type I error by examining the costs or penalties attached to both types of errors. If Type I error involves the time and trouble of reworking a batch of chemicals that should have been accepted, whereas Type II error means taking a chance that an entire group of users of this chemical compound will be poisoned, then in such a situation one should prefer a Type I error to a Type II error. Two-tailed and One-tailed tests: In the context of hypothesis testing, these two terms are quite important and must be clearly understood. A two-tailed test rejects the null hypothesis if, say, the sample mean is significantly higher or lower than the hypothesised value of the mean of the population. Such a test is appropriate when the null hypothesis is some specified value and the alternative hypothesis is a value not equal to the specified value of the null hypothesis. Mathematically we can state: But there are situations when only one-tailed test is considered appropriate. A one-tailed test would be used when we are to test, say, whether the population mean is either lower than or higher than some hypothesised value. For instance, if our  $H_0$   $H_0$ : In case our  $H_0$   $H_0$ :

**Chapter 3 : Basic Research Designs - Center for Innovation in Research and Teaching**

*Basic Concepts Learning Objectives Define the concept of a variable, distinguish quantitative from categorical variables, and give examples of variables that might be of interest to psychologists.*

Once can also define research as a scientific and systematic search for pertinent information on a specific topic. In fact, research is an art of scientific investigation. It is actually a voyage of discovery. A broad definition of research is given by Martyn Shuttleworth "In the broadest sense of the word, the definition of research includes any gathering of data, information and facts for the advancement of knowledge. It consists of three steps: Pose a question, collect data to answer the question, and present an answer to the question.

**Objectives of Research** The purpose of research is to discover answers to questions through the application of scientific procedures. The main aim of research is to find out the truth which is hidden and which has not been discovered as yet. Though each research study has its own specific purpose, we may think of research objectives as falling into a number of following broad groupings: To gain familiarity with a phenomenon or to achieve new insights into it studies with this object in view are termed as exploratory or formulative research studies ; To portray accurately the characteristics of a particular individual, situation or a group studies with this object in view are known as descriptive research studies ; Md. Saeed Anwar, Khulna University, Khulna, Bangladesh Basic Concepts of Research Methodology To determine the frequency with which something occurs or with which it is associated with something else studies with this object in view are known as diagnostic research studies ; To test a hypothesis of a causal relationship between variables such studies are known as hypothesis-testing research studies.

**Characteristics of Good Research** Good research is systematic: Good research is logical Good research is empirical Good research is replicable

**Social Research** Social research refers to research conducted by social scientists, which follows by the systematic plan. Quantitative designs approach social phenomena through quantifiable evidence, and often rely on statistical analysis of many cases or across intentionally designed treatments in an experiment to create valid and reliable general claims. Qualitative designs emphasize understanding of social phenomena through direct observation, communication with participants, or analysis of texts, and may stress contextual and subjective accuracy over generality. Social research is the scientific study of society. The scope of social research can be small or large, ranging from the self or a single individual to spanning an entire race or country. Social research determines the relationship between one or more variables. Young which is as follows:

**Objectives of Social Research** Social Research is a scientific approach of adding to the knowledge about society and social phenomena. Knowledge to be meaningful should have a definite purpose and direction. The growth of knowledge is closely linked to the methods and approaches used in research investigation. Hence the social science research must be guided by certain laid down objectives enumerated below:

**Social science helps us to obtain and add to the knowledge of social phenomena.** This is one of the most important objectives of social research.

**Scientific Study of Social Life:** Social research is an attempt to acquire knowledge about the social phenomena. Man being the part of a society, social research studies human being as an individual, human behavior and collects data about various aspects of the social life of man and formulates law in this regards. The ultimate objective of the social science study is often and always to enhance the welfare of humanity. No scientific research makes only for the sake of study. The welfare of humanity is the most common objective in social science research. Young, social research aims to clarify facts. The classification of facts plays important role in any scientific research.

**Social control and Prediction:** In social research we generally study of the social phenomena, events and the factors that govern and guide them. Subject which is overdone should not be normally chosen, for it will be a difficult task to throw any new light in such a case; 2. Controversial subject should not become the choice of an average researcher; 3. Too narrow or too vague problems should be avoided; 4. The research focus i.

**Statement of the Problem** This statement signifies the need for defining a research problem. The problem to be investigated must be defined unambiguously for that will help to discriminate relevant data from the irrelevant ones. A proper definition of research problem will enable the researcher to be on the track whereas an ill-defined problem may create hurdles. Defining a research problem

properly and clearly is a crucial part of a research study and must in no case be accomplished hurriedly. However, in practice this is a frequently overlooked which causes a lot of problems later on. Hence, the research problem should be defined in a systematic manner, giving due weightage to all relating points. Saeed Anwar, Khulna University, Khulna, Bangladesh Basic Concepts of Research Methodology technique for the purpose involves the undertaking of the following steps generally one after the other: Statement of the problem in a general way; Understanding the nature of the problem; Surveying the available literature Developing the ideas through discussions; and Rephrasing the research problem into a working proposition Literature Review A literature review is a text written by someone to consider the critical points of current knowledge including substantive findings, as well as theoretical and methodological contributions to a particular topic. It provides an overview and a critical evaluation of a body of literature relating to a research topic or a research problem. It analyzes a body of literature in order to classify it by themes or categories, rather than simply discussing individual works one after another. Characteristics of Good Literature Review It is organized around issues, themes, factors, or variables that are related directly to the thesis or research question. It indicates the theoretical framework that the researcher is working with. It places the formation of research questions in their historical and disciplinary context. It identifies the most important authors engaged in similar work. It offers an explanation of how the researcher can contribute toward the existing body of scholarship by pursuing their own thesis or research question Objective of the Study Md. These objectives should be closely related to the research problem. The general objective of a study states what researchers expect to achieve by the study in general terms. It is possible and advisable to break down a general objective into smaller, logically connected parts. These are normally referred to as specific objectives. Specific objectives should systematically address the various research questions. They should specify what you will do in your study, where and for what purpose. Hypothesis of the Study Hypothesis is a tentative conjecture explaining an observation, phenomenon, or scientific problem that can be tested by further observation, investigation, or experimentation. Hypotheses are testable explanations of a problem, phenomenon, or observation. Both quantitative and qualitative research involve formulating a hypothesis to address the research problem. Hypotheses that suggest a causal relationship involve at least one independent variable and at least one dependent variable; in other words, one variable which is presumed to affect the other. Type of Hypothesis 1. The null hypothesis states that there is no association between the predictor and outcome variables in the population. The null hypothesis is the formal basis for testing statistical significance. The null hypothesis states that there is association between the predictor and outcome variables in the population. The alternative hypothesis cannot be tested directly; it is accepted by exclusion if the test of statistical significance rejects the null hypothesis. One and Two-tailed Hypotheses A one-tailed or one-sided hypothesis specifies the direction of the association between the predictor and outcome variables. A two-tailed hypothesis states only that an association exists; it does not specify the direction. Saeed Anwar, Khulna University, Khulna, Bangladesh Basic Concepts of Research Methodology Characteristics of Hypothesis A hypothesis should state the expected pattern, relationship or difference between two or more variables; A hypothesis should be testable; A hypothesis should offer a tentative explanation based on theories or previous research; A hypothesis should be concise and lucid. Variables of the Study Variable is observation that can take different values. It is a measurable characteristic that varies. It may change from group to group, person to person, or even within one person over time. A variable is an object, event, idea, feeling, time period, or any other type of category you are trying to measure. There are two types of variables-independent and dependent. An independent variable is exactly what it sounds like. Just like an independent variable, a dependent variable is exactly what it sounds like. It is something that depends on other factors. Conceptual Framework Conceptual Framework is a written or visual presentation that explains either graphically, or in narrative form, the main things to be studied "the key factors, concepts or variables and the presumed relationship among them. The main objective in forming a conceptual framework is to help the researcher give direction to the research. The conceptual framework identifies the research tools and methods that may be used to carry out the research effectively. Saeed Anwar, Khulna University, Khulna, Bangladesh Basic Concepts of Research Methodology Theoretical Framework The objective of forming a theoretical framework is to define a broad framework within which a researcher

may work. The theoretical framework enhances overall clarity of the research. It also helps the researcher get through the research faster as he has to look only for information within the theoretical framework, and not follow up any other information he finds on the topic. This is founded on the theoretical framework, which lies on a much broader scale of resolution. The theoretical framework dwells on time tested theories that embody the findings of numerous investigations on how phenomena occur. The theoretical framework provides a general representation of relationships between things in a given phenomenon. The conceptual framework, on the other hand, embodies the specific direction by which the research will have to be undertaken. Statistically speaking, the conceptual framework describes the relationship between specific variables identified in the study. It also outlines the input, process and output of the whole investigation. The conceptual framework is also called the research paradigm. The theoretical framework looks at time-tested theories in relation to any research topic. The theoretical framework looks at the general relationship of things in a phenomenon, while conceptual framework puts forth the methods to study the relationship between the specific variables identified in the research topic. Conceptual framework gives a direction to the research that is missing in theoretical framework by helping decide on tools and methods that may be employed in the research. It includes; research design, Study population, sample and sample size, methods of data collection, methods of data analysis and anticipation of the study. Research methodology refers to a philosophy of research process. It includes the assumptions and values that serve a rationale for research and the standards or criteria the researcher uses for collecting and interpreting data and reaching at conclusions Martin and Amin,

**Chapter 4 : The 3 Basic Types of Descriptive Research Methods**

*The research team implemented a complex approach to verify the hypotheses which elaboration passes through the following stages: At the first stage, the concept of the survey was defined with the participation of authorized.*

The methodology section of a research paper answers two main questions: How was the data collected or generated? And, how was it analyzed? The writing should be direct and precise and always written in the past tense. Importance of a Good Methodology Section You must explain how you obtained and analyzed your results for the following reasons: Readers need to know how the data was obtained because the method you chose affects the results and, by extension, how you interpreted their significance. Methodology is crucial for any branch of scholarship because an unreliable method produces unreliable results and, as a consequence, undermines the value of your interpretations of the findings. In most cases, there are a variety of different methods you can choose to investigate a research problem. The methodology section of your paper should clearly articulate the reasons why you chose a particular procedure or technique. The reader wants to know that the data was collected or generated in a way that is consistent with accepted practice in the field of study. For example, if you are using a multiple choice questionnaire, readers need to know that it offered your respondents a reasonable range of answers to choose from. The method must be appropriate to fulfilling the overall aims of the study. For example, you need to ensure that you have a large enough sample size to be able to generalize and make recommendations based upon the findings. The methodology should discuss the problems that were anticipated and the steps you took to prevent them from occurring. For any problems that do arise, you must describe the ways in which they were minimized or why these problems do not impact in any meaningful way your interpretation of the findings. In the social and behavioral sciences, it is important to always provide sufficient information to allow other researchers to adopt or replicate your methodology. This information is particularly important when a new method has been developed or an innovative use of an existing method is utilized. Writing the Empirical Journal Article. University of Washington; Denscombe, Martyn. The Good Research Guide: Writing a Successful Thesis or Dissertation: Structure and Writing Style I. Groups of Research Methods There are two main groups of research methods in the social sciences: The empirical-analytical group approaches the study of social sciences in a similar manner that researchers study the natural sciences. This type of research focuses on objective knowledge, research questions that can be answered yes or no, and operational definitions of variables to be measured. The empirical-analytical group employs deductive reasoning that uses existing theory as a foundation for formulating hypotheses that need to be tested. This approach is focused on explanation. The interpretative group of methods is focused on understanding phenomenon in a comprehensive, holistic way. Interpretive methods focus on analytically disclosing the meaning-making practices of human subjects [the why, how, or by what means people do what they do], while showing how those practices arrange so that it can be used to generate observable outcomes. Interpretive methods allow you to recognize your connection to the phenomena under investigation. However, the interpretative group requires careful examination of variables because it focuses more on subjective knowledge. Content The introduction to your methodology section should begin by restating the research problem and underlying assumptions underpinning your study. If the method you choose lies outside of the tradition of your field [i. The remainder of your methodology section should describe the following: Decisions made in selecting the data you have analyzed or, in the case of qualitative research, the subjects and research setting you have examined, Tools and methods used to identify and collect information, and how you identified relevant variables, The ways in which you processed the data and the procedures you used to analyze that data, and The specific research tools or strategies that you utilized to study the underlying hypothesis and research questions. In addition, an effectively written methodology section should: Introduce the overall methodological approach for investigating your research problem. Is your study qualitative or quantitative or a combination of both mixed method? Are you going to take a special approach, such as action research, or a more neutral stance? Indicate how the approach fits the overall research design. Your methods for gathering data should have a clear connection to your research problem. In other words, make sure that

your methods will actually address the problem. One of the most common deficiencies found in research papers is that the proposed methodology is not suitable to achieving the stated objective of your paper. Describe the specific methods of data collection you are going to use, such as, surveys, interviews, questionnaires, observation, archival research. If you are analyzing existing data, such as a data set or archival documents, describe how it was originally created or gathered and by whom. Also be sure to explain how older data is still relevant to investigating the current research problem. Explain how you intend to analyze your results. Will you use statistical analysis? Will you use specific theoretical perspectives to help you analyze a text or explain observed behaviors? Describe how you plan to obtain an accurate assessment of relationships, patterns, trends, distributions, and possible contradictions found in the data. Provide background and a rationale for methodologies that are unfamiliar for your readers. Be clear and concise in your explanation. Provide a justification for subject selection and sampling procedure. For instance, if you propose to conduct interviews, how do you intend to select the sample population? If you are analyzing texts, which texts have you chosen, and why? If you are using statistics, why is this set of data being used? If other data sources exist, explain why the data you chose is most appropriate to addressing the research problem. Are there any practical limitations that could affect your data collection? How will you attempt to control for potential confounding variables and errors? If your methodology may lead to problems you can anticipate, state this openly and show why pursuing this methodology outweighs the risk of these problems cropping up. Once you have written all of the elements of the methods section, subsequent revisions should focus on how to present those elements as clearly and as logically as possible. The description of how you prepared to study the research problem, how you gathered the data, and the protocol for analyzing the data should be organized chronologically. For clarity, when a large amount of detail must be presented, information should be presented in sub-sections according to topic. If you are conducting a qualitative analysis of a research problem, the methodology section generally requires a more elaborate description of the methods used as well as an explanation of the processes applied to gathering and analyzing of data than is generally required for studies using quantitative methods. Because you are the primary instrument for generating the data, the process for collecting that data has a significantly greater impact on producing the findings. Therefore, qualitative research requires a more detailed description of the methods used. If your study involves interviews, observations, or other qualitative techniques involving human subjects, you may be required to obtain approval from your Institutional Review Board before beginning your research. If this is the case, you must include a statement in your methods section that you received official endorsement and adequate informed consent from the IRB and that there was a clear assessment and minimization of risks to participants and to the university. This statement informs the reader that your study was conducted in an ethical and responsible manner. In some cases, the IRB approval notice is included as an appendix to your paper.

**Problems to Avoid**

**Irrelevant Detail** The methodology section of your paper should be thorough but to the point. Do not provide any background information that does not directly help the reader understand why a particular method was chosen, how the data was gathered or obtained, and how the data was analyzed in relation to the research problem [note: Save how you interpreted the findings for the discussion section]. With this in mind, the page length of your methods section will generally be less than any other section of your paper except the conclusion.

**Unnecessary Explanation of Basic Procedures** Remember that you are not writing a how-to guide about a particular method. You should make the assumption that readers possess a basic understanding of how to investigate the research problem on their own and, therefore, you do not have to go into great detail about specific methodological procedures. The focus should be on how you applied a method, not on the mechanics of doing a method. An exception to this rule is if you select an unconventional methodological approach; if this is the case, be sure to explain why this approach was chosen and how it enhances the overall process of discovery.

**Problem Blindness** It is almost a given that you will encounter problems when collecting or generating your data, or, gaps will exist in existing data or archival materials. Do not ignore these problems or pretend they did not occur. Often, documenting how you overcame obstacles can form an interesting part of the methodology. It demonstrates to the reader that you can provide a cogent rationale for the decisions you made to minimize the impact of any problems that arose.

**Literature Review** Just as the literature review

section of your paper provides an overview of sources you have examined while researching a particular topic, the methodology section should cite any sources that informed your choice and application of a particular method [i. Such a list of sources is useful in and of itself, especially if it is accompanied by an explanation about the selection and use of the sources. Writing the Methods Section. Sense Publishers , pp. Corwin, ; Carter, Susan. Structuring Your Research Thesis. Palgrave Macmillan, ; Kallet, Richard H. Describing Your Research Plan. A Comprehensive Guide to Content and Process. Thousand Oaks, Sage Publications, , pp. Methods, Results, and Discussion. Purdue University; Methods and Materials. Writing Tip Statistical Designs and Tests? Do Not Fear Them! A qualitative approach, such as conducting interviews or content analysis of archival texts, can yield exciting new insights about a research problem, but it should not be undertaken simply because you have a disdain for running a simple regression. A well designed quantitative research study can often be accomplished in very clear and direct ways, whereas, a similar study of a qualitative nature usually requires considerable time to analyze large volumes of data and a tremendous burden to create new paths for analysis where previously no path associated with your research problem had existed. Another Writing Tip Knowing the Relationship Between Theories and Methods There can be multiple meaning associated with the term "theories" and the term "methods" in social sciences research.

**Chapter 5 : Research - Wikipedia**

*Published: Tue, 06 Mar Basic Concepts of Research INTRODUCTION: During the last two decades and more, the socio-business environment of the world has witnessed dramatic changes in its nature and scope.*

Descriptive research methods are pretty much as they sound – they describe situations. They do not make accurate predictions, and they do not determine cause and effect. There are three main types of descriptive methods: This article will briefly describe each of these methods, their advantages, and their drawbacks. This may help you better understand research findings, whether reported in the mainstream media, or when reading a research study on your own.

**Observational Method** With the observational method sometimes referred to as field observation animal and human behavior is closely observed. There are two main categories of the observational method – naturalistic observation and laboratory observation. The biggest advantage of the naturalistic method of research is that researchers view participants in their natural environments. This leads to greater ecological validity than laboratory observation, proponents say. Ecological validity refers to the extent to which research can be used in real-life situations. Proponents of laboratory observation often suggest that due to more control in the laboratory, the results found when using laboratory observation are more meaningful than those obtained with naturalistic observation. Laboratory observations are usually less time-consuming and cheaper than naturalistic observations. Of course, both naturalistic and laboratory observation are important in regard to the advancement of scientific knowledge.

**Case Study Method** Case study research involves an in-depth study of an individual or group of individuals. Case studies often lead to testable hypotheses and allow us to study rare phenomena. Case studies should not be used to determine cause and effect, and they have limited use for making accurate predictions. There are two serious problems with case studies – expectancy effects and atypical individuals. Describing atypical individuals may lead to poor generalizations and detract from external validity.

**Survey Method** In survey method research, participants answer questions administered through interviews or questionnaires. After participants answer the questions, researchers describe the responses given. In order for the survey to be both reliable and valid it is important that the questions are constructed properly. Questions should be written so they are clear and easy to comprehend. Another consideration when designing questions is whether to include open-ended, closed-ended, partially open-ended, or rating-scale questions for a detailed discussion refer to Jackson, Advantages and disadvantages can be found with each type: Open-ended questions allow for a greater variety of responses from participants but are difficult to analyze statistically because the data must be coded or reduced in some manner. Closed-ended questions are easy to analyze statistically, but they seriously limit the responses that participants can give. It is important to emphasize that descriptive research methods can only describe a set of observations or the data collected. It cannot draw conclusions from that data about which way the relationship goes – Does A cause B, or does B cause A? Nothing could be further from the truth.

**Research Methods and Statistics: A Critical Thinking Approach** 3rd edition. Jamie has written seven books and co-authored one.

**Chapter 6 : Methodology - Wikipedia**

*Methodology Methodology is the study of methods and the underpinning philosophical assumptions of the research process itself (Wimmer & Dominick, ). It also means a system of methods used in a specific area of study or activity to carry out a research.*

For purposes of identification of reality we try to give a name to it. By using the name we communicate with others and over time it becomes part of our language. A concept is a generalized idea about a class of objects, attributes, occurrences, or processes that has been given a name. In other words a concept is an idea expressed as a symbol or in words. Natural science concepts are often expressed in symbolic forms. Most social science concepts are expressed as words. Words, after all, are symbols too; they are symbols we learn with language. Height is a concept with which all of you are familiar. In a sense, a language is merely an agreement to represent ideas by sound or written characters that people learned at some point in their lives. Learning concepts and theory is like learning language. Concepts are an Abstraction of Reality Concepts are everywhere, and you use them all the time. Height is simple concept form everyday experience. What does it mean? It is easy to use the concept of height, but describing the concept itself is difficult. It represents an abstract idea about physical reality, or an abstraction of reality. Height is a characteristic of physical objects, the distance from top to bottom. All people, buildings, trees, mountains, books and so forth have height. The word height refers to an abstract idea. We associate its sound and its written form with that idea. There is nothing inherent in the sounds that make up the word and the idea it represents. The connection is arbitrary, but it is still useful. People can express the abstract idea to one another using these symbols. The concepts stand for phenomenon not the phenomenon itself; hence it may be called an abstraction of empirical reality. Degree of Abstraction Concepts vary in their level of abstraction. They are on a continuum from the most concrete to the most abstract. Very concrete ones refer to straightforward physical objects or familiar experiences e. More abstract concepts refer to ideas that have a diffuse, indirect expression e. Moving up the ladder of abstraction, the basic concept becomes more abstract, wider in scope, and less amenable to measurement. The scientific researcher operates at two levels of concepts and propositions and on the empirical level of variables. Sources of Concepts Everyday culture is filled with concepts, but many of them have vague and unclear definitions. Likewise, the values and experiences of people in a culture may limit everyday concepts. Nevertheless, we borrow concepts from everyday culture; though these to be refined. We create concepts from personal experiences, creative thought, or observation. The classical theorist originated many concepts like family system, gender role, socialization, self-worth, frustration, and displaced aggression. We also borrow concepts from sister disciplines. Specialists use jargon as a short hand way to communicate with one another. Most fields have their own jargon. Physicians, lawyers, engineers, accountants, plumbers, and auto mechanics all have specialized languages. They use their jargon to refer to the ideas and objects with which they work. Special problems grow out of the need for concept precision and inventiveness. Vague meanings attached to a concept create problems of measurement. Therefore, not only the construction of concepts is necessary but also these should be precise and the researchers should have some agreement to its meaning. Identification of concepts is necessary because we use concepts in hypothesis formulation. Here too one of the characteristics of a good hypothesis is that it should be conceptually clear. The success of research hinges on 1 how clearly we conceptualize and 2 how well others understand the concept we use. For example we might ask respondents for an estimate of their family income. This may seem to be a simple, unambiguous concept, but we may receive varying and confusing answers unless we restrict or narrow the concept by specifying: If words have different meanings to the parties involved, then they are not communicating on the same wave-length. Definitions are one way to reduce this danger. Dictionary Definitions Researchers must struggle with two types of definitions. In the more familiar dictionary, a concept is defined with synonyms. For example, a customer is defined as a patron: These circular definitions may be adequate for general communication but not for research. Dictionary definitions are also called conceptual or theoretical or nominal definitions. Conceptual definition is a definition in abstract, theoretical terms. It refers to other ideas or

constructs. There is no magical way to turn a construct into precise conceptual definition. It involves thinking carefully, observing directly, consulting with others, reading what others have said, and trying possible definitions. A single construct can have several definitions, and people may disagree over definitions. Conceptual definitions are linked to theoretical frameworks and to value positions. For example, a conflict theorist may define social class as the power and property a group of people in a society has or lacks. A structural functionalist defines it in terms of individual who share a social status, life-style, or subjective justification. Although people disagree over definitions, the researcher should always state explicitly which definition he or she is using. Some constructs are highly abstract and complex. They contain lower level concepts within them e. Other concepts are concrete and simple e. When developing definitions, a researcher needs to be aware of how complex and abstract a construct is. For example, a concrete construct such as age is easier to define e.

**Chapter 7 : Understanding Applied and Basic Research**

*Chapter 1: Basic Concepts in Research and Data Analysis 3 with this material before proceeding to the subsequent chapters, as most of the terms introduced here will be referred to again and again throughout the text.*

Research Methods To understand the use of statistics, one needs to know a little bit about experimental design or how a researcher conducts investigations. A little knowledge about methodology will provide us with a place to hang our statistics. In other words, statistics are not numbers that just appear out of nowhere. Rather, the numbers data are generated out of research. Statistics are merely a tool to help us answer research questions. As such, an understanding of methodology will facilitate our understanding of basic statistics.

**Validity** A key concept relevant to a discussion of research methodology is that of validity. When an individual asks, "Is this study valid? There are four types of validity that can be discussed in relation to research and statistics. Thus, when discussing the validity of a study, one must be specific as to which type of validity is under discussion. Therefore, the answer to the question asked above might be that the study is valid in relation to one type of validity but invalid in relation to another type of validity. Each of the four types of validity will be briefly defined and described below. Be aware that this represents a cursory discussion of the concept of validity. Each type of validity has many threats which can pose a problem in a research study. Examples, but not an exhaustive discussion, of threats to each validity will be provided. For a comprehensive discussion of the four types of validity, the threats associated with each type of validity, and additional validity issues see Cook and Campbell Unfortunately, without a background in basic statistics, this type of validity is difficult to understand. According to Cook and Campbell , "statistical conclusion validity refers to inferences about whether it is reasonable to presume covariation given a specified alpha level and the obtained variances  $p$ . If a study has good statistical conclusion validity, we should be relatively certain that the answer to these questions is "yes". Examples of issues or problems that would threaten statistical conclusion validity would be random heterogeneity of the research subjects the subjects represent a diverse group - this increases statistical error and small sample size more difficult to find meaningful relationships with a small number of subjects. Does A cause B? If a study is lacking internal validity, one can not make cause and effect statements based on the research; the study would be descriptive but not causal. There are many potential threats to internal validity. For example, if a study has a pretest, an experimental treatment, and a follow-up posttest, history is a threat to internal validity. If a difference is found between the pretest and posttest, it might be due to the experimental treatment but it might also be due to any other event that subjects experienced between the two times of testing for example, a historical event, a change in weather, etc. One is examining the issue of construct validity when one is asking the questions "Am I really measuring the construct that I want to study? For example, if I want to know a particular drug Variable A will be effective for treating depression Variable B , I will need at least one measure of depression. If that measure does not truly reflect depression levels but rather anxiety levels Confounding Variable X , than my study will be lacking construct validity. Thus, good construct validity means the we will be relatively sure that Construct A is related to Construct B and that this is possibly a causal relationship. Examples of other threats to construct validity include subjects apprehension about being evaluated, hypothesis guessing on the part of subjects, and bias introduced in a study by expectencies on the part of the experimenter. External validity addresses the issue of being able to generalize the results of your study to other times, places, and persons. For example, if you conduct a study looking at heart disease in men, can these results be generalized to women? Therefore, one needs to ask the following questions to determine if a threat to the external validity exists: Types of Research Studies There are four major classifications of research designs. These include observational research, correlational research, true experiments, and quasi-experiments. Each of these will be discussed further below. There are many types of studies which could be defined as observational research including case studies, ethnographic studies, ethological studies, etc. The primary characteristic of each of these types of studies is that phenomena are being observed and recorded. Often times, the studies are qualitative in nature. For example, a psychological case study would entail extensive notes based on observations of and interviews with the client. A detailed

report with analysis would be written and reported constituting the study of this individual case. These studies may also be qualitative in nature or include qualitative components in the research. For example, an ethological study of primate behavior in the wild may include measures of behavior durations i.e. This measure of time would be qualitative. Surveys are often classified as a type of observational research. In general, correlational research examines the covariation of two or more variables. For example, the early research on cigarette smoking examine the covariation of cigarette smoking and a variety of lung diseases. These two variable, smoking and lung disease were found to covary together. Correlational research can be accomplished by a variety of techniques which include the collection of empirical data. Often times, correlational research is considered type of observational research as nothing is manipulated by the experimenter or individual conducting the research. For example, the early studies on cigarette smoking did not manipulate how many cigarettes were smoked. The researcher only collected the data on the two variables. Nothing was controlled by the researchers. It is important to not that correlational research is not causal research. In other words, we can not make statements concerning cause and effect on the basis of this type of research. There are two major reasons why we can not make cause and effect statements. Second, a third variable may be involved of which we are not aware. An example may help clarify these points. In other words, low levels of these two neurotransmitters have been found to be associated with increased levels of clinical depression. However, while we know that the two variables covary - a relationship exists - we do not know if a causal relationship exists. Second, a third variable has been uncovered which may be affecting both of the variables under study. Thus, it is possible that the increased number of receptors on the postsynaptic neuron is actually responsible for the relationship between neurotransmitter levels and depression. As you can see from the discussion above, one can not make a simple cause and effect statement concerning neurotransmitter levels and depression based on correlational research. To reiterate, it is inappropriate in correlational research to make statements concerning cause and effect. Correlational research is often conducted as exploratory or beginning research. Once variables have been identified and defined, experiments are conductable. The true experiment is often thought of as a laboratory study. However, this is not always the case. A true experiment is defined as an experiment conducted where an effort is made to impose control over all other variables except the one under study. It is often easier to impose this sort of control in a laboratory setting. Thus, true experiments have often been erroneously identified as laboratory studies. To understand the nature of the experiment, we must first define a few terms: Experimental or treatment group - this is the group that receives the experimental treatment, manipulation, or is different from the control group on the variable under study. Control group - this group is used to produce comparisons. Independent variable - this is the variable that the experimenter manipulates in a study. It can be any aspect of the environment that is empirically investigated for the purpose of examining its influence on the dependent variable. Dependent variable - the variable that is measured in a study. The experimenter does not control this variable. Random assignment - in a study, each subject has an equal probability of being selected for either the treatment or control group. Double blind - neither the subject nor the experimenter knows whether the subject is in the treatment or the control condition. Now that we have these terms defined, we can examine further the structure of the true experiment. First, every experiment must have at least two groups: Each group will receive a level of the independent variable. The dependent variable will be measured to determine if the independent variable has an effect. As stated previously, the control group will provide us with a baseline for comparison. All subjects should be randomly assigned to groups, be tested a simultaneously as possible, and the experiment should be conducted double blind. Perhaps an example will help clarify these points. Wolfer and Visintainer examined the effects of systematic preparation and support on children who were scheduled for inpatient minor surgery. The hypothesis was that such preparation would reduce the amount of psychological upset and increase the amount of cooperation among thee young patients. Eighty children were selected to participate in the study. Children were randomly assigned to either the treatment or the control condition. During their hospitalization the treatment group received the special program and the control group did not. Care was take such that kids in the treatment and the control groups were not roomed together. Measures that were taken included heart rates before and after blood tests, ease of fluid intake, and self-report anxiety measures. The study demonstrated that the systematic preparation and

support reduced the difficulties of being in the hospital for these kids. Let us examine now the features of the experiment described above. First, there was a treatment and control group. If we had had only the treatment group, we would have no way of knowing whether the reduced anxiety was due to the treatment or the weather, new hospital food, etc. The control group provides us with the basis to make comparisons. The independent variable in this study was the presence or absence of the systematic preparation program.

## Chapter 8 : Basic Concepts of Research Methodology | Saeed Anwar - calendrierdelascience.com

*Research Methods: The Basics is an accessible, user-friendly introduction to the different aspects of research theory, methods and practice. Structured in two parts, the first covering the nature of knowledge.*

**Basic Research Designs** Basic Research Designs This module will introduce the basics of choosing an appropriate research design and the key factors that must be considered. **Learning Objectives** Distinguish between quantitative and qualitative research methods. Identify whether or research project is qualitative or quantitative in nature. List the key factors that must be considered when choosing a research design. Once the research question has been formulated, it is critical that the researcher select the appropriate research methodology to answer the question. The type of research question will typically dictate the methodology that will be employed. The reliability and validity of the results depends on upon proper selection of the research approach and design. **Forms of Research** Research is a systematic inquiry used to describe, explain, predict or control some observed phenomenon - the research topic. Research can be classified into four main forms based on the specific purpose: **Basic Research** - This research is descriptive in nature and is used to understand and explain a phenomenon. This type of research is often conducted for the sake of increasing and advancing a knowledge base. **Applied Research** - The purpose of this research is to provide information that can be used and applied in an effort to help people understand and control their environment. This type of research is more prescriptive in nature and seeks to offer potential solutions to problems. **Evaluation Research** - The purpose of evaluation research is to examine the processes and outcomes associated with a particular solution to a problem. The research may be formative in that it attempts to improve the intervention or solution or it may be summative and attempt to evaluate the effectiveness of solution or program. **Action Research** - This research is often conducted within a program, organization or community and the researchers are involved in gathering data and studying themselves. Regardless of the purpose of the research, the process is similar. The researcher will then develop a research problem related to the topic and create a specific question. The research design will then be developed and the procedures for analyzing the data will be identified. The results of the research will hopefully lend themselves to the publication of a scholarly article. **Quantitative and Qualitative Designs** There are two main approaches to a research problem - quantitative and qualitative methods. Quantitative methods are used to examine the relationship between variables with the primary goal being to analyze and represent that relationship mathematically through statistical analysis. This is the type of research approach most commonly used in scientific research problems. Qualitative methods are chosen when the goal of the research problem is to examine, understand and describe a phenomenon. These methods are a common choice in social science research problems and are often used to study ideas, beliefs, human behaviors and other research questions that do not involve studying the relationship between variables. **Choosing a Design** The following table lists and describes the most common research designs used at Grand Canyon University. Different research books will use different terms for similar types of research. However, the research designs identified in this document are fairly common in terms of their use and their terminology. **Types of Research Designs.**

## Chapter 9 : Research Methods/concepts | Psychology Concepts

*The research process deals with the ways and strategies used by researchers to understand the world around us. This is a guide to basic elements of scientific research.*