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DEDICATION

This book is dedicated to Chloe Andrea and Regina Tiatira

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This book is about how to use quantitative and qualitative research and how to combine the methods among those approaches. It starts from philosophical common grounds, theory, and application. There is a tendency of current researchers using the combined methods in which people regard it more satisfactorily. Above from pros and cons the fact is that it is not easy to use the combined methods correctly. This book tries to suggest some models, hopefully it can help readers to use each approach and method correctly.

Suggestions and questions can be sent to the following email: jsarwono007@gmail.com or jonathan@iwu.ac.id

Bandung, April 2022
Author

CHAPTER I

PRELIMINARY

1.1 Human Truth Searching

In everyday life since ancient times humans have always tried to find the essence of truth about things that are essential, such as God's problems, death, life after death, love and others. Humans try to understand and conquer a universe full of mysteries. Until the era that was colored with the sophistication of technology today, the feeling to understand and understand the secrets of the universe including secrets about himself.

In the middle ages, humans have not shown interest in systematic studies of the physical world, these conditions are much influenced by Greek philosophical opinions which prioritize "the general" rather than "the special". General knowledge refers to the essence and essence of concrete things, while special things distinguish between one thing and another.

In Greek mythology the term god Zeus is known to be associated with weather, rain and lightning, the god Poseidon who ruled the oceans and earthquakes. When natural disasters such as earthquakes, floods and others occur; humans always connect with supernatural things. In the development of his thinking finally humans after experiencing various processes succeed in using the inner reasoning power (ratio) solve the problem. As happened in the Middle Ages with scientific discoveries by Copernicus and Edison. As the opinion of a philosopher Rene Descartes who said "*Cogito Ergo Sum*" (I was there because of thinking) then humans began to use his extraordinary mind.

Even so, it is necessary to distinguish between the use of *common sense* and science. The basic difference between the two is the word "systematic" and "controlled". There are five main things that distinguish between science and common sense. First, science is developed through theoretical structures, and tested for internal consistency. In developing its structure, it is done by testing or testing empirically. While the use of common sense is usually not.

Secondly, in science, theories and hypotheses are always tested empirically. This is with people who are not scientists in a "selective" way. Third, there is an understanding of control which in scientific research can have various meanings. Fourth, science emphasizes the existence of a connection between phenomena consciously and systematically. The pattern of connecting is not done carelessly. The fifth, the difference lies in how to give different explanations in observing a phenomenon. In explaining the relationship between phenomena, scientists carry out caution and avoid metaphysical interpretations. The resulting propositions are always open for scientific observation and testing.

1.1 The Occurrence of the Natural Secularization Process

In the beginning, humans considered nature to be sacred, so that between subjects and objects there is no limit. In its development as mentioned above, there has been a shift in the concept of law (nature). Law is defined as fixed links and must be between symptoms. Regular links in nature have always been interpreted into normative laws. Here this understanding is associated with God or para god as the creator of the law that must be obeyed. Towards the 16th century humans began to abandon the notion of normative law. Instead the understanding of the law appears in accordance with natural law. This understanding implies that there is an order in nature and the order can be concluded through empirical research. Scientists at that time argued that God as the creator of natural law gradually gained abstract and impersonal nature. Nature has lost its sacredness, instead a picture of the world that corresponds to the natural sciences for modern humans with human scientific abilities begins to open up the secrets of nature.

1.2 Various Ways to Find the Truth

In human history, efforts to search for truth have been done in various ways such as:

Coincidentally: There is a story whose truth is hard to trace regarding the discovery of a malaria drug case that happened by accident. When an Indian is sick and drinks water in the pond and finally gets a cure. And that happens repeatedly in some people. Finally, it was discovered that around the ponds grew a kind of tree whose skin was used as a malaria medicine which then fell on the pond. The discovery of the tree that would later be known as the quinine tree was accidental.

Trial And Error: Another way to get the truth is to use the "*trial and error*" method which means trial and error. This method is chancy. One example is

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the *experimental model of the "problem box"* by Thorndike. The experiment is as follows: a hungry cat is put into a *"problem box"* - a room that can only be opened when the cat manages to pull the end of the rope by opening the door. Because of hunger and seeing food outside the cat trying to get out of the box in various ways. Finally, accidentally the cat managed to touch the knot of the rope that made the door open and he managed to get out. The experiment was based on uncertain things, namely the ability of the cat to open the door to the problem box.

Use of Authority: Truth can be obtained through the authority of someone who holds power, such as a king or a government official whose decisions and policies are considered right by his subordinates. In Javanese philosophy known as 'Sabita pendita ratu', it means that the words of the king or priest are always true and cannot be denied again.

Problem Solving by Speculation: Solving the problem with the *"trial and error"* method which emphasizes the element of chancy and uncertainty and accuracy.

Critical Thinking / Based on Experience: Another method is thinking critically and based on experience. An example of this method is thinking deductively and inductively. Deductively means to think from the general to the special; being inductive from being specific to the general one. Deductive methods have been used for hundreds of years since Aristotle's time.

Use of Scientific Investigation: According to Francis Bacon a new truth can be obtained by using scientific inquiry, critical and inductive thinking.

Problem Solving Method: The problem-solving method developed by Karl. R. Popper in 1937 was a variation of the *"trial and error"* method . this method shows the scheme as follows: P1-TS-EE-P2, P1 is the initial problem, TS tentative solution - the theory that is attempted to submit, EE is *"error elimination"* - evaluation with the aim of finding and removing errors, and P2 is a new situation caused by a critical evaluation of the solution tentative to the initial problem so that new problems arise.

Knowledge Basics: In this section, the basics of knowledge that will spearhead scientific thinking will be discussed. The basics of knowledge are as follows:

Reasoning: What is meant by reasoning is the activity of thinking according to a certain pattern, according to certain logic in order to produce knowledge. Logical thinking has multiple connotations, is analytical. This stream that uses reasoning as a source of truth is called the flow of rationalism and which considers facts to be captured through experience as truth called the empiricism flow.

Logic (How to withdraw conclusions): The second characteristic is logic or how to draw conclusions. What is meant by logic as defined by William SS is "study to think *validly*. In logic there are two kinds, namely inductive and deductive logic.

Source of Knowledge: The source of knowledge in this world stems from human attitudes that doubt every symptom in the universe. Humans do not want to accept things that exist including the fate of himself. Rene Descarte once said "*de omnibus dubitandum*" which means that everything must be doubted. The issue of the criteria for establishing truth is hard to believe. From various streams, various criteria of truth emerged.

Truth Criteria: One criterion of truth is the existence of consistency with previous statements that are considered true. Some truth criteria include:

Coherence Theory: What is meant by the theory of coherence is that a statement is considered true if the statement is coherent and consistent with previous statements that are considered true. An example is mathematics, which is a form of compilation, proving it based on coherent theory.

Correspondence Theory: The correspondence theory was pioneered by Bertrand Russel. In this theory a statement is considered true if the material of knowledge is conceived corresponds to the object intended by the statement. An example is if someone says that the British capital is London, then that statement is true. Whereas if he said that the capital of England was Jakarta, then the statement was wrong; because in reality the British capital is London not Jakarta.

Pragmatic Theory: The main character in this theory is Charles S Pierce. Pragmatic theory says that the truth of a statement is measured by the criteria whether the statement is functional in practical life. The truth criteria are based on the usefulness of the theory. Besides that this school believes that a theory will not last , in a certain period of time it can be changed by making a revision.

Ontology: Ontology is the essence of what is studied or the knowledge itself. A philosopher named Democritus explained the principles of materialism to say as follows: Just based on habit, sweetness is sweet, the heat is hot, cold is cold, the color is color. That is, sensing objects are often considered real, but not so. Only the atom and void are real. So the term "sweet, hot and cold" is only the terminology that we give to the symptoms captured by the senses.

Science is knowledge that tries to interpret this universe as it is, therefore humans in exploring knowledge cannot be separated from the symptoms that are in it. And the nature of science that serves to help humans in solving problems does not need to have absolutes such as religion that provide guidance on the most essential things from this life. Even so, to a certain extent, science needs to have validity in making generalizations. For example, how we define humans, then various meanings will emerge.

Epistemology: Epistemology is meant to get the right knowledge. Some things that need to be considered in getting knowledge are: Limitation of the study of science: ontologically limiting science to the study of objects that are within the scope of humans. Cannot review transcendental areas. How to compile knowledge: to get knowledge into science a way is needed to compile it by using the scientific method. 3. Required foundation that is in accordance with the ontological and axiological science itself. Explanation directed at the description of the relationship of various factors that are bound in a constellation of causes of the emergence of a symptom and the process of occurrence. 4. The scientific method must be systematic and explicit. 5. The scientific method cannot be applied to knowledge that does not belong to the group of knowledge. 6. Science tries to find an explanation of nature and makes conclusions that are general and impersonal. 7. Characteristics that stand out the theoretical framework: Exact sciences: deductive, ratio, quantitative. Social Sciences: inductive, empirical, qualitative

Some Basics Concept: Concepts are terms and definitions used to describe symptoms in the abstract, for example events, circumstances, groups. It is expected that the researcher is able to formulate his thoughts into concepts clearly in relation to the simplification of several problems related to each other. In the world of research there are two notions of concepts, namely: First, concepts that are clearly related to reality are represented, for example: tables, cars etc. Second, concepts that abstract their relationship with reality are represented, for example: intelligence, kinship, etc.

Construct: The construct is a concept created and used with intent and awareness for specific scientific purposes.

Proposition: Proposition is a logical relationship between two concepts. In social research there are two types of propositions known; the first axiom or postulate,

the second theorem. Axioms are propositions whose truth is no longer in research, while theorems are propositions which are deduced from axioms.

Theory: One definition of theory is a series of assumptions, concepts, constructs, definitions and propositions to explain a phenomenon systematically by way of formulating relationships between concepts. Shone (2022) said that “A theory is a generalized synthetic explanatory statement, in other words, an abstract conceptual explanation of the world. Conceptual explanations are important in order to generalize our findings across a wide range of situations, but unless they lead to predictions, we cannot test our theories, so we need models” Another definition says that theory is scientific knowledge that includes an explanation of a particular invoice from one scientific discipline.

Theory has several characteristics as follows: a) must be consistent with previous theories allows no contraction in overall scientific theory; b) must be compatible with empirical facts, because the theory which, however consistent, if not supported by empirical testing is not scientifically acceptable.

There are four ways the theory is built according to Melvin Marx: 1) Model Based Theory, 2) Deductive Theory, 3) Inductive Theory, and 4) Functional Theory. Based on the first theory the theory developed with the existence of conceptual networks which were then tested empirically. The substance validity lies in the initial stages of testing the model, namely whether the model works according to the needs of the researcher.

The second theory says a theory is developed through a process of deduction. Deduction is a form of inference which decreases a conclusion obtained through the use of logical thought accompanied by premise as evidence. Deductive theory is a theory that emphasizes conceptual structure and substance validity. This theory also focuses on building concepts before empirical testing.

The third theory emphasizes the empirical approach to get generalizations. Drawing conclusions is based on repeated reality observations and develops statements that function to explain and explain the existence of these statements.

The fourth theory says a theory is developed through continuous interaction between the conceptualization process and empirical testing that follows it. The main difference with deductive theory lies in the process of conceptualization at the beginning of the development of the theory. In

deductive theory the design of conceptual relationships is formulated and testing is carried out at the final stage of the development of the theory.

Scientific Logic: The combination of deductive and inductive logic where rationalism and empiricism are together in a system with a corrective mechanism.

Hypothesis: The hypothesis is a temporary answer to the problem being studied. The hypothesis is a suggestion of scientific research because a hypothesis is a work instrument of a theory and is specific in nature that is ready to be tested empirically. In formulating the hypothesis the statement must be a reflection of the relationship between two or more variables.

Relational or descriptive hypotheses are called work hypotheses (H1), while statistical tests require a work hypothesis and a reverse formulation of the working hypothesis. Such a hypothesis is called the null hypothesis (H0). Shone (2022) states hypothesis as a statement that can be empirically tested, i.e. translation of theory into a testable statement

Variable: Variables are constructs or traits that are being studied. According to Shone (2022) “A variable is something that varies over time or over subjects (in other words, varies within the study), also used to mean the operational definition of a concept (how do we measure something)”.

There are five types of variables that are known in the research, namely: the independent variable, the dependent variable, moderate, intervening variables and control variables. If viewed from the side of the measurement scale, there are four types of variables: nominal, ordinal, interval and ratio.

Operational definition: What is meant by operational definition is the specification of the activities of the researcher in measuring or manipulating a variable. Operational definitions limit or mean a variable by detailing what the researcher must do to measure the variable.

Means of Scientific Thinking: Language, Mathematics and Statistics

Axiology: Axiology is a matter of the value of the usefulness of science. Science is not value free. This means that at certain stages sometimes science must be adapted to the cultural and moral values of a society; so that the value of the use of knowledge can be felt by the community in their efforts to improve shared prosperity, not the other way around, instead it causes disasters

CHAPTER 2 RESEARCH DEFINITION AND TYPES

2.1 Definition

There are some definitions of the research. Shone (2022) define research as” A systematic and unbiased way of solving a problem (by answering questions or supporting hypotheses) through generating verifiable data.”. Another definition states that “Research attempts to provide answers to questions. Such answers may be very abstract and generally the case of basic research or they may be highly concrete and specific as is often the case in applied research. (Tuckman 1978)

Based on the above definition simply can be said that research is systematic ways to answer the problem being studied. Systematic words are keywords that are related to the scientific method which means there is a procedure that is characterized by order and completeness. In more detail Davis (1985) gives the characteristics of a scientific method as follows:

First	The method must be critical, analytical, meaning that the method show the right and correct process for identify problems and determine methods for problem solution
Second	The method must be logical, meaning that there is a method used for give away argumentation scientific. Conclusions made rationally are based on available evidence.
Third	The method is objective, meaning that objectivity results investigations that can be emulated by other scientists in the same study with the same conditions
Fourth	Methods must be conceptual and theoretical; therefore that, to direct the research process that is carried out researchers need to develop concepts and structures theory so that the results can be accounted for scientific view point.
Fifth	The method is empirical, meaning the method used based on facts in the field

2.2 Types of Research

The types of research are distinguished based on the type of data needed in general divided into two, namely primary research and secondary research.

2.2.1 Primary Research

Primary research requires data or information from the first source, we usually call the respondent. Data or information is obtained through written questions using a questionnaire or oral using the interview method. Included in this category are: a. Case study: Case studies use individuals or groups as their study material. Usually case studies are longitudinal. b. Survey: Surveys are quantitative studies that are used to examine the symptoms of a group or individual behavior. In general,

surveys use questionnaires as data collection tools. The survey adheres to the rules of the quantitative approach, namely the larger the sample, the more it reflects the resulting population. c. Experimental Research: Experimental research uses individuals or groups as study material. In general, this research uses two or more groups to serve as the object of their study. The first group is the group under study while the second group is the comparison group (control group). Experimental research uses a standard, structured and specific design.

2.2.2 Secondary Research

Secondary research uses material that is not from the first source as a means to obtain data or information to answer the problem under study. This research is also known as research that uses literature studies and which are usually used by researchers who adhere to a qualitative approach. Suharsini Arikunto (1992) divides the types of research based on a) purpose, b) approach, c) field of science, d) place or setting, e) presence of variables.

2.2.3 Research is seen from its purpose

If research is seen from its objectives, then there are three sub-types of research, namely exploratory research, verification research and development research. Exploratory type research is used to conduct answers to why certain events arise, for example the emergence of natural disasters in certain areas continuously. Verification research is used to re-examine the results of previous research with the aim of verifying the truth of the results of previous studies. Development research aims to develop innovative models or things. This type of research is usually carried out in a company in order to develop new products or services.

2.2.4 Research is seen from the approach

Viewed from the approach, this research is divided into two, namely longitudinal and cross-sectional approaches. Approach first doing research based on a certain period of time, usually a long time, for example a researcher conducts research on the development of children's speaking abilities from the age of 10 months to 24 months. On the contrary, the second approach of the researchers conducted a study of children's speaking abilities ranging from 10 months to 24 months simultaneously at the same time.

2.2.5 Research is seen from the field of science

In this perspective, the types of research are divided based on their respective disciplines, such as education research, technical research, economic research, etc.

2.2.6 Research seen from the location / background

When viewed from a place or setting where a researcher conducts research, then this type of research is divided into three, namely: a) laboratory research, b) field research, c) library research. Laboratory research is usually carried out in the exact sciences, such as medical, electrical, civil, etc. Field research is usually carried out by social and economic scientists where the location of the research is in a particular community or group of people or certain objects as the setting where the

researcher conducts research. Library research is carried out in the library by reviewing the literature, previous research, journals and other sources in the library. With the increasingly sophisticated information technology, this type of research at this time does not have to be done in a physical library, but it can also be done from any location by using the Internet as a medium to find information in libraries around the world that make their data accessible directly to users for free and anytime

2.2.7 Research is seen from the presence of variables

Research seen from the presence of variables can be categorized in research whose objects are past, present and period variables that will come. Research whose objects are past and current variables is also called descriptive research or describe the variables being studied. Being research object variables that will come, then the variables are yet but accidentally created by researchers to provide treatment. This type of research is also called experimental research whose purpose is used to find causal relationships between the variables studied.

CHAPTER 3

RESEARCH PROPOSAL

3.1 Definition

The research proposal is a means for researchers to communicate their thoughts about the problems to be studied and serve to convince readers or assessors that the researcher's thinking is feasible and will at least provide benefits related to the relevant disciplines. Because the function of the research proposal, the proposal should be written-oriented research to the reader / assessor / donor funds . Furthermore, the research proposal is written using persuasive language so that those who read in addition to understanding the problem will also easily give approval for the implementation of the proposal. In writing research proposals, researchers should also use standard language and straightforward. Although the purpose is persuasive, avoid long-winded and lengthy languages. The most important thing is that what we write can be the most effective means of communicating our ideas so that the reader feels the need to approve them.

3.2 Systematics of Research Proposal

There are various systematic versions of research commonly used by researchers. The various versions depend on the institution that issued it. Even so there is a red thread between various versions, including the main things that must be present in a study, namely the title, formulation of the problem, the purpose of the study, the methodology used, personnel who conduct, time and cost of research. If it is used in making research in the student environment, usually for the part of the fee is eliminated. The following will describe the research proposals issued by the Directorate of Research Development and Community Service. The author chose this based on consideration of the scope of the problem, a systematic, easy to understand sequence and general usage range. The systematics are as follows:

- a. Research Title: In general, the research title reflects at least the relationship between two or more variables. In title writing, it should be made as short as possible by using straightforward and specific language so that the reader can easily understand what the researcher will do.
- b. Knowledge field: This section provides an explanation of the fields of study
- c. Preliminary: In the introduction, the researcher usually reveals the main reason why the person chooses a particular problem to be studied so that the reader can understand the importance of the problem to be examined from the scientific side. Also in this section, the researcher may write down the wishes of the researcher to reveal a symptom / concept / conjecture that is being considered.

- d. Formulation of the problem: In general, the formulation of the problem is written in the question sentence and the problem formulation should reflect the relationship of two or more variables. The researcher should also mention the hypothesis to be tested as well as the approaches, methods and techniques in answering the problem to be studied.
- e. Literature review: In this section the researcher describes the literature review that underlies the research that will be carried out taken from the latest reference sources, for example from books or journals. The things discussed in this section are relevant theories and the results of previous similar studies. The aim is to avoid discussion of the same problem or duplication of other people's research.
- f. Research purposes: The purpose of the study contains a description that answers the formulation of the problem above. Besides that also in this section the researcher can also describe the purpose to explain, prove or apply a symptom, concept, guess or make a prototype.
- g. Research contributions: Here the researcher explains the contribution or benefits of the research to be carried out in terms of the development of science, technology and art, solving problems in development and institutional development.
- h. Research methods: This section describes the method used to answer the problem in detail which includes the variables under study, the research design used, data collection techniques, data analysis techniques, how to interpret and infer the results of the study.
- i. Implementation Schedule: The research schedule should be written in detail starting from preparation, preparation of research instruments, data collection, processing and analysis of data and research reports.
- j. Research Personnel: The name of the researcher and his staff (if any) is written in this section.

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- k. Estimated Research Costs: Write down the estimated cost of the study in detail and refer to the specific format applicable in determining the amount of points that must be paid.

CHAPTER 4

THE STAGES OF RESEARCH PROCESS

In this chapter, we will discuss the stages of the research process which includes the following activities:

1. Identifying Problems
2. Make a hypothesis
3. Study of literature
4. Identify and Name Variables
5. Making Operational Definitions
6. Manipulating and Controlling Variables
7. Compile Research Design
8. Identifying and Compiling Observation and Measurement Tools
9. Making a Questionnaire
10. Perform Statistical Analysis
11. Using a Computer for Data Analysis
12. Writing Research Report

4.1 Identifying Problems

What is meant by identifying a problem is that the researcher carries out the first stage in conducting research, namely formulating the problem to be examined. This stage is the most important stage in research, because all the research paths will be guided by the formulation of the problem. Without clear problem formulation, the researcher will lose direction in conducting research..

4.2 Make a hypothesis

The hypothesis is a temporary answer to the problem that we examine. The formulation of hypotheses is usually divided into three stages: first, determine the research hypothesis based on the author's assumptions about the relationship of the variables being studied. Second, determine the operational hypothesis consisting of Hypothesis 0 (H_0) and Hypothesis 1 (H_1). Third, determine the statistical hypothesis. H_0 is neutral and H_1 is not neutral. Please note that not all studies require hypotheses, such as descriptive research.

4.3 Literature Study

At this stage the researcher does what is called a literature review, which is to study reference books and the results of previous similar studies that have been done by other people. The aim is to get a theoretical basis for the problem to be studied. Theory is the basis for researchers to understand the problems that are examined correctly and in accordance with the scientific framework.

4.4 Identifying and Giving Variable Names

Identifying and naming variables is one of the important stages because only by knowing the variables being studied, a researcher can understand the relationship and meaning of the variables being studied.

4.5 Making Operational Definitions

Operational definitions are definitions that make the variables being studied become operational in relation with the process of measuring these variables. Operational definitions make it possible for an abstract concept to be an operational one, making it easier for researchers to take measurements.

4.6 Manipulating and Controlling Variables

What is meant by manipulating variables is to give a treatment to the independent variable with the aim of the researcher being able to see the effect on the dependent variable or the variables it influences. While what is meant by controlling the variable is to control certain variables in the study so that the variable does not interfere with the relationship between independent variables and dependent variables..

4.7 Compiling Research Design

What is meant by compiling a research design? Research design, especially in research that uses a quantitative approach is a tool in research where a researcher depends on determining the success or failure of the research being carried out. Research design is like a guiding tool for researchers in carrying out the process of determining data retrieval instruments, determining samples, collection of data and analysis. Without a good design, the research carried out will not have high validity.

4.8 Identifying and Compiling Observation and Measurement Tools

What is meant by this section is the stage where a researcher must identify what tools are appropriate for retrieving data in relation to the purpose of his research. In research that uses a quantitative approach researchers usually use questionnaires, especially in Ex Post Facto types of research.

4.9 Making a Questionnaire

In research that uses a quantitative approach, the questionnaire is one of the important tools for data collection; therefore, researchers must be able to make questionnaires properly. How to make a questionnaire can be divided into two, namely in terms of formatting questions and answer models.

4.10 Perform Statistical Analysis

One prominent feature in research using quantitative approaches is the presence of statistical analysis. Statistical analysis is used to help researchers know the meaning of relationships between variables. Until now, statistical analysis is the only tool that can be scientifically accounted for to calculate the magnitude of the relationship between variables, to predict the effect of independent variables on dependent variables, to see the percentage size or the average magnitude of a variable that we measure..

4.11 Using Computers for Data Analysis

With the development of increasingly sophisticated computer technology and demanded to conduct research more quickly and the possibility of large amounts of data, then a researcher needs the help of a computer to do data analysis. A lot of software has been developed to assist researchers in analyzing data, both data processing and analysis. One popular program is the IBM SPSS program.

4.12 Writing Report on Research Results

The last stage in research is to make a report on the results of the study in writing. A written report can be made so that researchers can communicate the results of research to reader or raised funds.

CHAPTER 5

CHOOSING PROBLEMS AND MAKING HYPOTHESES

5.1 Introduction

Choosing a problem to study is an important stage in conducting research, because in essence the entire research process that is carried out is to answer a predetermined question. Choosing a problem is also not easy because there is no standard guide . Even so with practice and scientific sensitivity, choosing the right problem can be done.

How researchers search for problems to be studied, some of the basic guidelines below will make it easier for us to find problems:

- a. Problems should form at least the relationship between two or more variables
- b. The problem must be stated clearly and not double and generally formulated in the form of question sentences .
- c. Problems must be tested using empirical methods, which are possible data collection that will be used as material to answer the problem being studied.
- d. Problems may not represent moral and ethical position problems.

5.2 Variable Inter- Relationships

Problems should reflect the relationship of two or more variables, because in practice researchers will examine the effect of one particular variable on other variables. For example, a researcher wants to know whether or not the influence of "leadership style" (variable one) on "employee performance" (variable two).

If a researcher uses only one variable in formulating the problem, then the person concerned only does a descriptive study, for example "leadership style in company X". Researchers in this case will only conduct studies of existing leadership styles without considering other factors that influence or are influenced by the leadership style.

Example: Relationship between employee motivation and work performance

Motivation: variable one; Job performance: variable two

5.3 Problems Are Formulated Obviously

The problem must be clearly formulated and not double or allow for more than one interpretation and formulated in the form of question sentences. Examples:

- a. Is there a relationship between promotion and sales volume?
- b. Does the color of Suzuki motorcycles affect consumers' buying interest?
- c. Does mobile phone product design influence consumer buying decisions?
- d. Is there a connection between reading interest and the high achievement index?

The examples above reflect the formulation of a problem that is clear and not meaningful. In the example "a" the researcher wants to examine the relationship of promotional variables with the variable sales volume. In the example "b" the researcher wants to do a study of the relationship of the variable "Suzuki motorcycle color" to the variable "buying interest". In the example "c" the researcher will examine the relationship between variables "mobile product design" with the variable "buying decision". In the example "d" the researcher will examine the relationship between "reading interest" and the "achievement index".

5.4 Can Be Tested Empirically

The problem must be empirically tested, meaning that the formulation of the problem made allows researchers to look for data as a means of proof. The main purpose of data collection is to prove that the problem being studied can be answered if the researcher searches and collects data. In words, the problem is the results of the research, the researcher collects the problem.

5.5 Avoid Morals and Ethical Assessments

We recommend that researchers avoid problems related to idealism or values, because the problem is more difficult to measure compared to problems related to attitude or performance. For example we will have difficulty measuring problems such as the following:

Should all students not cheat on the exam? Should all students be diligent in learning?

It would be better if the problem was made in a form like:

The relationship between test readiness and the value achieved
Effect of student craft on the speed of graduation

5.6 Strategies for Determining Problems

One way to make a good problem formulation is by narrowing the problem from the very general to the more specific and eventually becoming a specific problem and ready to be studied.

Sample case:

5.6.1 Recognizing a symptom

The emergence of a sense of dissatisfaction among computer programmers in a particular company. The company's earnings have continued to increase well over the past five years. Oral complaints have been received from employees regarding the payroll structure which is considered to be inadequate.

5.6.2 Identification of problems

- a) Evaluating internal and external data by carrying out activities as follows:
Monitoring the dissatisfaction and disseminating information on company earnings Track whether there has ever been a sense of dissatisfaction in the past. Search for literature / references that address issues similar to those experienced by the company with problems in other companies.
- b) Conduct isolation of the problem area Management does not have a consistent payroll allocation plan. Based on the interview outside, it is known that there is dissatisfaction with the payroll system. The directors have inventoried complaints from employees regarding payroll discrimination.
- c)

5.6.3 Formulation of the problem

The problem statement will read as follows:

What are the main factors related to payroll levels for professional computer experts in the company.

Is there a connection between increasing company earnings and dissatisfaction among programmers.

5.7 Special Considerations in Choosing Problems to Be Researched

In making a selection of problems you can consider the following:

- a. Can Be Implemented: If we choose a particular problem, then the questions below are useful for us to check whether we can or do not do research with the problem we set: 1) Is the problem within our reach? 2)

- Do we have enough time to do research with this problem? 3) Will we get access to the sample we will use as respondents as a means of obtaining data and information? 4) Do we have special reasons so that we believe we can get answers to the problems we formulate? 5) Have we mastered the required methods?
- b. Research Range: Is the problem sufficient to be investigated? Is the number of variables enough? Is the amount of data sufficient to be reported in writing?
 - c. Linkages: Are we interested in the problem and how to solve it? Are the problems we are researching related to our knowledge or work background? If we do research with this problem will we get added value for our self-development?
 - d. Theoretical Value: Will the problems that will be examined reduce the existing theoretical gaps? Will other parties, such as readers or funders, recognize the importance of this study? Will the results of his research contribute to the knowledge of the science we are studying? Are the results of the research worthy of publication?
 - e. Practical Value: Will the results of his research be practical values for practitioners in the fields that are suitable for the problem to be studied?

5.8 Making Hypotheses

5.8.1 Definition

After the problem is formulated, the next step is to formulate a hypothesis. What is the hypothesis? There are many definitions of hypotheses which essentially refer to the same understanding. Among them is a hypothesis is a temporary answer to the problem being studied. A hypothesis is a statement that can be empirically tested, i.e. translation of theory into a testable statement. (Shone, 2022). While according to Nasution the definition of a hypothesis is "a tentative statement which is an estimate of what we are observing in an attempt to understand it". (Nasution: 2000)

5.8.2 Function of the Hypothesis

The hypothesis can be derived from the theory relating to the problem that we will examine. For example, a researcher will conduct a research on the price of a product so that in order to reduce a good hypothesis, it is better for those concerned to read the theory regarding price determination.

The hypothesis is a transient truth that needs to be tested for validity, therefore the hypothesis functions as a possibility to test the truth of a theory. If the hypothesis has been tested and proved its truth, then the hypothesis becomes a theory. So a hypothesis is derived from a theory that already exists, then tested the truth and finally raises a new theory.

The function of the hypothesis according to according to. Nasution is as follows: 1) to test the truth of a theory, 2) provide new ideas to develop a theory and 3) broaden the knowledge of researchers about a phenomenon being studied.

5.8.3 Considerations in Formulating a Hypothesis

In formulating the hypothesis the researcher needs considerations including:

It must express the relationship between two or more variables, meaning that in formulating a hypothesis a researcher must have at least two variables to be studied. Both of these variables are independent variables and dependent variables. If the variable is more than two, then usually one variable depends on two independent variables.

It must be stated clearly and not double, meaning that the formulation of the hypothesis must be specific and referring to one meaning must not cause interpretation of more than one meaning. If the hypothesis is formulated in general, then the hypothesis cannot be tested empirically.

It must be able to be empirically tested, the intention is to allow it to be expressed in an operational form that can be evaluated based on data obtained empirically. Hypotheses should not reflect moral elements, values or attitudes.

5.8.4 Types of Hypotheses

Broadly speaking there are two types of hypotheses based on the level of abstraction and form.

According to the level of abstraction the hypothesis is divided into:

- a. The hypothesis states that there are similarities in the empirical world: this type of hypothesis relates to general statements whose truths are recognized by many people in general, for example "the Javanese people have a refined attitude and are gentle", "if there is the sound of a dead animal the dry season begins to arrive, "if it rains the city of Jakarta Flood". General truths like the one above that have been known by many people in general, if tested scientifically are not necessarily true.

- b. The hypothesis concerning the ideal model: in reality the world is very complex, so to study the complexity of the world we need the help of philosophy, methods, types that exist. Knowledge of authoritarianism will help us understand, for example in the world of leadership, father's relationship in educating his child. Knowledge of the idea of nativism will help us understand the emergence of a leader.

- c. The hypothesis is used to find relationships between variables: this hypothesis formulates the relationship between two or more variables studied. In compiling the hypothesis, the researcher must be able to know which variables influence other variables so that the variable changes.

According to the form, the hypothesis is divided into three:

Research / work hypothesis: the research hypothesis is the basic assumption of the researcher on a problem being studied. In this hypothesis the researcher correctly considers the hypothesis which will then be empirically proven through hypothesis testing by using the data obtained during the research. For example: There is a relationship between the economic crisis and the number of people stressed

Operational hypothesis: the operational hypothesis is an objective hypothesis. This means that researchers formulate hypotheses not solely based on their basic assumptions, but also based on their objectivity, that the research hypothesis made is not necessarily correct after being tested using existing data. Therefore researchers need a comparison hypothesis that is objective and neutral or technically called the null hypothesis (H_0). H_0 is used to give balance to the research hypothesis because the researcher believes in testing the hypothesis's right or wrong research depends on the evidence obtained during conduct research.

Example:

H_0 : There is no relationship between the economic crisis and the number of people stressed.

Statistical hypothesis: The statistical hypothesis is a type of hypothesis that is formulated in the form of statistical notation. This hypothesis is formulated based on researchers' observations of the population in the form of numbers (quantitative).

For example: $H_0: r = 0$; or $H_0: p = 0$

5.8.5 How to Formulate a Hypothesis

The way to form a hypothesis is with the following stages: formulate the research hypothesis, operational hypothesis, and statistical hypothesis. The research hypothesis is a hypothesis that we make and expressed in sentence form.

Example 1: Associative hypothesis

Formulation of the problem:

Is there a relationship between leadership style and employee performance?

Research hypothesis:

There is a relationship between leadership style and employee performance

The operational hypothesis is to define the hypothesis operationally the variables in it so that it can be operationalized. For example "leadership style" operationalized- it is a way of giving instructions to subordinates. Employee performance is operationalized as a high and low income company. The operational hypothesis is made into two, namely hypothesis 0 which is neutral and hypothesis 1 which is not neutral

Then the statement of the operational hypothesis:

H0: There is no relationship between how to give instructions to subordinates with high - low income of companies H1: There is a relationship between how to give instructions to subordinates with high - low income of the company

The statistical hypothesis is an operational hypothesis that is translated into statistical numbers according to the measurement tool chosen by the researcher. In this example the assumption is an increase in income of 30%, then the hypothesis reads as follows:

H0: $P = 0,3$

H1: $P \neq 0,3$

Example 2: Descriptive hypothesis

Formulation of the problem: How much is the mastery of English among students?

Research hypothesis: Mastery of English among students is less than standard

The operational hypothesis:

H0 = Mastery of English among students is the same as standard

H1 = Mastery of English among students is not the same as standard

Statistical hypothesis

H0: $r = 80\% (0.8)$

H1: $r \neq 80\% (0.8)$

The standard is assumed to be equal to 80% of the mastery of English.

Example 3: Comparative hypothesis

Formulation of the problem: How is the attitude of students in Bandung to drug abuse compared to student attitudes in Yogyakarta

Research hypothesis: There are differences in attitudes towards drug abuse among students in Bandung and students in Yogyakarta

Operational hypothesis:

H0 = There is no difference in the percentage of attitudes towards drug abuse among students in Bandung and students in Yogyakarta

H1 = There are differences in the percentage of attitudes towards drug abuse among students in Bandung and students in Yogyakarta

Statistical Hypothesis:

H0: $r_{\text{Bandung}} = r_{\text{Yogyakarta}}$

H1 :: $r_{\text{Bandung}} \neq r_{\text{Yogyakarta}}$

5.9 Hypothesis testing

The hypothesis that has been formulated then must be tested. This test will prove that H0 or H1 will be accepted. If H1 is accepted then H0 is rejected, meaning that there is a relationship between how to give instructions to subordinates with high - low income of the company.

CHAPTER 6

STUDY OF LITERATURE

6.1 Aim

The main purpose of conducting a literature study is 1) Finding the variables to be studied, 2) Distinguishing the things that have been done and determining the things that need to be done, 3) Synthesizing and obtaining new perspectives, 4) Determining the meaning and relationship between variable.

The first objective of conducting a literature study is to find the variables to be studied. In practice, researchers often find it difficult to formulate problems that deserve to be studied. The problem examined is essentially the variables that will be examined. Besides helping to identify the problems to be studied, literature studies can also help researchers in defining variables both conceptually and operationally and more importantly is helping to identify the existence of relationships between variables that are conceptually or operationally important to study.

The second goal is to distinguish between things that have been done and determine the things that need to be done so that there is no duplication of research or work in the past that has been done by someone else. Also note that past research can be material or at least give ideas or inspiration to the research that will be carried out at this time, especially previous discoveries can give us direction in conducting current research. We often get a lot of results from past research suggesting that further / more in-depth research be conducted on the topics studied.

The third objective is to synthesize and obtain a new perspective, meaning that if a researcher can carefully synthesize the results of similar studies in the past, it is possible that the researcher will find something important about the symptoms being questioned and the ways in which they can be applied in current research context. In general, researchers prefer things that are specific rather than things that are general.

The fourth objective is to determine the meaning and relationship between variables, because all variables studied must be named, defined and put together with problems that have been formulated along with the hypothesis. If someone performs the process of defining variables without conducting a library study first, then it is likely that will diperoleh ialah kesalahan dalam pendefinisian variabel. By conducting a library study the author in question will get theoretical guidance in ways to define a variable and also the possibilities of a variable conceptually defined by previous researchers. Especially in the social sciences and psychology, in general symptoms or variables are conceptually and operationally defined in existing theoretical books.

6.2 Sources

Some library sources that can be used by researchers include 1) abstracts of research results, 2) indices, 3) *reviews*, 4) journals 5) reference books. Abstract research results are valuable reference sources because in abstract researchers usually write the essence of the research which includes: methods used, problem formulation, research results and conclusions. By reading the research abstract we will get an overall picture of the research that has been done. The main advantage of abstract reading is that we can learn the methods used by these researchers, so that it inspires us to use similar methods in different contexts and settings.

The index provides book titles compiled based on the main description of each book but does not provide abstracts, for example the Internet Index will be displayed as follows: heading section g (news head) Internet, proxy server . Headings give us information about books on the Internet, the main thing discussed is about proxy servers.

The review contains writings that synthesize works or books that have been written in a certain period of time. Posts are arranged by topic and content. In a review, the author usually provides comparisons and even criticisms of books or works reviewed by those concerned. Sometimes the author of the review also provides alternative conclusions to the reader whose purpose is so that the reader can get a different view from the book he reads.

Journals contain writings in one field of the same discipline, for example management science in economics or informatics engineering in computer science. The main use of the journal is that it can be used as a secondary data source because in general the writings in the journal are the results of research. We can also use the writing in the journal as a citation material for reference in our research as well as reference books.

Reference books contain writings that are common in certain disciplines. It's good we choose books that are reference books that are as a guide in using or making things. A good reference book will contain deep writing on certain topics and accompanied by supporting theories so that we will be able to know the development of theories in the sciences discussed in the book.

6.3 How to search

How to search the library can be done manually or online. If done manually, the researcher must visit libraries, information sources, such as the Central Bureau of

Statistics. If done online, the researcher must have a computer connected to the Internet. Due to the absence of censorship on the Internet, we need to evaluate the quality of writing / books / references that are on the Internet. The following are discussed ways to measure the quality of writing on the Internet:

- a. Reliability: the references sought should be considered reliability, especially from the side of the author. If the author is indeed an expert in his field, then the writing can be trusted in its quality. In the back *cover* of the book, usually a short history of the author is written, for example the experience of writing a book, his studies, and his career path. From this information we can assess how much reliability the book is currently written in relation to the field of knowledge and experience in writing a book.
- b. CARS (*Credibility Accuracy Reasonableness and Support*) checklist: Cars checklist (Robert Harris, 1997) can be used to test the quality of information originating from the Internet.

First, credibility involves clear and accountable sources of information that allow us to believe it; clarity of the author's background regarding education, address, experience, position, and judgment of fellow writers; quality control from fellow writers; clear references taken from journals or other research results. Second, accuracy includes not *up-to-date*, factual, detailed, definite, comprehensive, reader-oriented and purpose-oriented, making current sources not expired information, and can provide a full picture of the truth. Third, it can be accepted with common sense which includes fair and impartial, provides balance, is objective, does not give rise to conflicts of interest, is not incitement; has the purpose to be used as a source that can be trusted because it raises the whole truth. Fourth, the existence of support such as reference sources, contact information, enabling service demands, the aim is to provide convincing evidence to the reader if the reader makes a claim.

CHAPTER 7

IDENTIFYING AND GIVING VARIABLE NAMES

7.1 Definition

Variables are defined as "something that may vary or differ" (Brown, 1998: 7). Another definition that is more detailed says that the variable "is simply symbolic that can assume any one of a set of values" (Davis, 1998: 23). While Shone (2022) define a variable as something that varies over time or over subjects (in other words, varies within the study), also used to mean the operational definition of a concept (how do we measure something).

The first definition states that variables are something different or varied, emphasizing the word something is clarified in the second definition, namely a symbol or concept which is assumed to be a set of values. The abstract definition will be clearer if given an example as follows:

- a. Relations between intelligence and learning achievement
- b. Influence of colors on interest in buying a motorcycle
- c. Relationship between promotion and sales volume

Examples of variables are: intelligence, learning achievement, color, buying interest, promotion and sales volume

7.2 Variable Types

7.2.1 Independent Variables: Independent variable is a stimulus variable or variable that affects other variables. Independent variables are variables that are the variables are measured, manipulated, or chosen by the researcher to determine the relationship with a symptom observed. In the example above, "color" is an independent variable that can be manipulated and seen its influence on "buying interest", for example whether the red color of a motorcycle can lead to consumer buying interest in the motorcycle.

7.2.2 Dependent Variables: Dependent variable is a variable that gives a reaction / response if it is associated with a free variable. Dependent variable is a variable whose variables are observed and measured to determine the effect caused by the independent variable. In the example of the influence of color on motorbike buying interest, the dependent variable is "buying interest". How big is the influence of red on consumer buying interest in the motorcycle. To ensure the influence of red

independent variables on buying interest, the red color can be replaced with blue. If the magnitude of the effect is different, the manipulation of the free variable proves that there is a relationship between the color independent variable and consumer buying interest.

7.2.3 Relationship Between Independent Variables and Dependent Variables

In general, people do research using more than one variable, namely independent variables and dependent variables. The two variables are then searched for relationships

Example 1

Research hypothesis: There is a relationship between "leadership style" and "performance" employees

Independent variable: leadership style

Dependent variables on buying interest

Leadership style has a relationship with employee performance, for example a centralized leadership style will have an impact on employee performance is different from the delegative leadership style.

Example 2

Research hypothesis: There is a relationship between promotion and sales volume

Independent variable: promotion

Dependent variable on: sales volume

Promotion has a relationship with the presence and absence of an increase in sales volume in certain companies.

7.2.4 Moderate Variables

The moderate variable is the second independent variable that is deliberately chosen by the researcher to determine whether his presence influences the relationship between the first independent variable and the dependent variable. Moderate variables are variables whose variables are measured, manipulated, or chosen by the researcher to find out whether the variable changes the relationship between independent variables and dependent variables.

In the case of a relationship between motorcycle colors and buying interest, researchers chose the moderate variable as "price". By entering the moderate price

variable, the researcher wants to know whether the magnitude of the relationship between the two variables changes. If it changes then the existence of moderate variables plays a role, while if it does not change the moderate variable does not affect the relationship between the two variables studied.

Another example:

Hypothesis: There is a relationship between promotion on television media with the increasing awareness of Samsung mobile phone brands among consumers

Independent variable: promotion

Dependent variable: brand awareness

Moderate variable: media promotion

7.2.5 Control Variable

In research researchers always try to eliminate or neutralize the influence that can disrupt the relationship between independent variables and dependent variables. A variable whose influence will be removed is called a control variable. Control variables are defined as variables whose variables are controlled by researchers to neutralize their effects. If not controlled, these variables will affect the symptoms being studied.

Example:

Hypothesis: there is an influence of shirt color contrast on buying decisions among women

Independent variable: color contrast

Dependent variable: buying decisions

Control variable: gender

In the case of research above the control variable of female sex. Assuming researchers only women are affected by the color contrast if they want to buy it.

7.2.6 Intervening Variables

Independent, dependent, control and moderate variables are concrete variables. The three variables, namely the independent, control and moderate variables can be manipulated by the researcher and the influence of the three variables can be seen or observed. As with the intervening variable is hypothetical, meaning that the effect is not concrete, but theoretically can affect the relationship between independent variables and depending on what is being studied. Therefore, an intermediate variable is defined as a variable that theoretically influences the relationship of variables being studied but cannot be seen, measured, and

manipulated; the effect must be inferred from the effects of independent variables and moderate variables on the symptoms being studied. For example:

Hypothesis: If the interest in the task increases, the performance of performing the task will increase

Independent variable: interest in the task

Dependent variable: the performance of the task

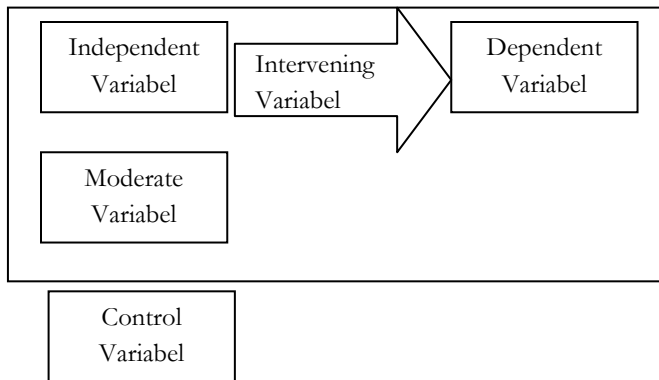
Intervening variable: learning process

The description of the case above is as follows: If students are interested in the assignments given by the lecturer, the results will be good. The size of the performance is influenced by interest; however the final results of the assignment are influenced by the factors students learn or not in doing the task first. With high interest and good preparation for learning, the performance will be even greater.

7.2.7 Variable Relationship Schemes

The relationship scheme between variables shows the influence of independent, moderate, control and intermediary variables on dependent variables.

The model scheme was made by Brown (1988) as follows:



The Brown scheme can be read as follows: the central relationship in the study is between independent variables and dependent variables. The arrows show more the direction of focus of the researchers' thinking and research design, rather than the causal relationship. Thus focus variable is the dependent variable. In the early stages of the research it was carried out only to determine the effect of independent variable on dependent variable. The intervening variable serves as label for the relationship between the two variables or the process that connects the independent variables and dependent variable but is not observed. Researchers may also consider the existence of other independent variable, namely a moderator

variable that will be used to determine whether there will be a change in the relationship between the independent variable and the dependent variable if the

moderator variable is included in the study. The researcher may also control other independent variables if the person concerned wants to neutralize, or eliminate the influence of the control variable.

7.2.8 Case Examples

Measuring methods in teaching on student achievement. The assumption of the researcher is that there are other variables that influence, namely the student's personality, gender and means of formality in the class.

Independent variable: method

Dependent variable: learning achievement

Moderator variable: student personality

Control variable: gender

Intervening variable: means of formality in class

Information from the above cases are as follows: The researcher wants to know whether or not there is an influence of the teaching method on student achievement. The teaching method is an independent variable and student achievement is a dependent variable. Researchers also consider the existence of other factors that influence the relationship of these two variables, namely student personality. Student personality variables are deliberately chosen to determine whether their presence influences the relationship between independent and dependent variables. Researcher intends to neutralize the possibility of influencing sex factors, therefore sex will be controlled as a control variable. The aim is to eliminate the possibility of confusion due to these factors. In theory the means of formality in the classroom will influence the relationship between teaching methods and student achievement. Then the means of formalities in the class are used as intermediary variables.

7.2.9 Paradigm of Relations Between Variables

The emphasis of research that uses a quantitative approach is the pattern of relationships between the variables being studied. This understanding is based on the philosophy of positivism which says that symptoms can be classified and symptoms have a causal or causal relationship. Therefore, in conducting research, researchers must be able to understand and find relationships between variables. Because the symptoms being studied can be seen by looking at the relationships between variables. The paradigm of relations between variables according to Sugiyono (2002) will be discussed further in this section, the author uses examples that have been adjusted, namely:

a. Simple Paradigm of Two Variable Relationships

Research that uses this paradigm only examines the relationship between one independent variable and one dependent variable.

Example:

Independent variable (X): promotion

Dependent variable (Y): sales volume

The relationship of these two variables can be described as follows:



The above paradigm will produce research as follows:

- 1 Problem Formulation: How much is the relationship (or the influence of advertising on sales volume?)
- 2 The theory needed by researchers is the theory of advertising and sales
- 3 The research hypothesis will be as follows: There is a relationship between advertising and sales volume
- 4 Data Analysis Techniques: to see the relationship between X and Y can be used Pearson Product Moment correlation while testing the hypothesis can be used to test the significance of product moment correlation.

b. Relationship Paradigm More Than Two Sequential Variables

Research that uses this paradigm will examine more than one independent variable with one dependent variable. The relationship between variables is still simple, namely sequentially, meaning that the condition of the independent variable 2 is the result of the existence of independent variables 1. In other words, the independent variable 1 affects the independent variable 2; independent variables 1 and 2 affect dependent variables.

Example:

Independent variable 1 (X1): Quality of wired network

Independent variable 2 (X2): Service quality

Dependent variable (Y): Customer satisfaction

The relationship pattern of these variables can be described as follows:



The relationship pattern can be explained as follows: the quality of the cable network affects the quality of service. The quality of the cable network and service

quality affect customer satisfaction.

c. Relationship Paradigm Between Two Independent Variables with One Dependent Variable

Research that uses this paradigm will examine the relationship of two independent variables with one dependent variable.

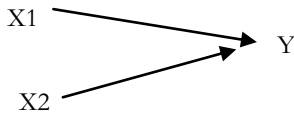
Example:

Independent variable 1 (X1): IQ

Independent variable 2 (X2): Motivation

Dependent variable (Y): Test results

The relationship pattern of these variables can be described as follows:



The pattern of relationships between these variables can be explained as follows:

IQ affects test results partially

Motivation affects the results of the exam partially

IQ and motivation affect test results simultaneously

d. Relationship Paradigm Three Independent Variables with One Dependent Variable

Research that uses this paradigm will examine the relationship of three independent variables with one dependent variable.

Example:

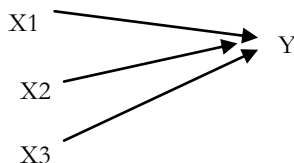
Independent variable 1 (X1): Salary

Independent variable 2 (X2): Career path

Independent variable 3 (X3): Employee recruitment system

Dependent variable (Y): Work performance

The relationship pattern of these variables can be described as follows:



The pattern of relationships between these variables can be explained as follows:

Salary affects work performance partially

Career paths affect work performance partially

Employee recruitment system influences work performance partially

Salaries, career paths and employee recruitment systems affect work performance simultaneously

e. Paradigm Relationship One Independent Variable with Two Dependent Variables

Research that uses this paradigm will examine the relationship of one independent variable with two dependent variables.

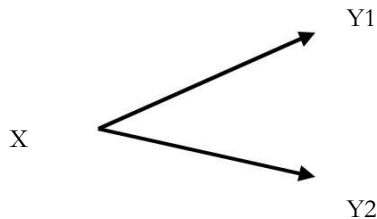
Example:

Independent variable (X): Education level

Dependent variable (Y1): Work achieved

Dependent variable 2 (Y2): Insight

The relationship pattern of these variables can be described as follows:



The pattern of relationships between these variables can be explained as follows

The level of education affects the work achieved and insight

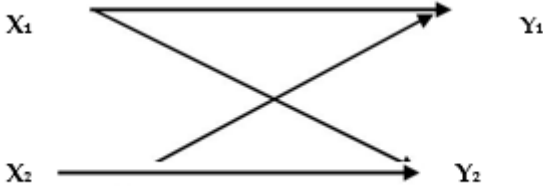
f. Relationship Paradigm Between Two Independent Variables with Two Dependent Variables

Research that uses this paradigm will examine the relationship of two independent variables with two dependent variables.

Example:

- Independent variable (X1): Service speed
- Independent variable (X2): Product price
- Dependent variable 1 (Y1): Number of customers
- Dependent variable 2 (Y2): Decision to buy

The relationship pattern of these variables can be described as follows:



The pattern of relationships between these variables can be explained as follows:

- Service speed affects the number of customers
- Service speed affects the decision to buy
- Product prices affect the number of customers
- Product prices affect buying decisions

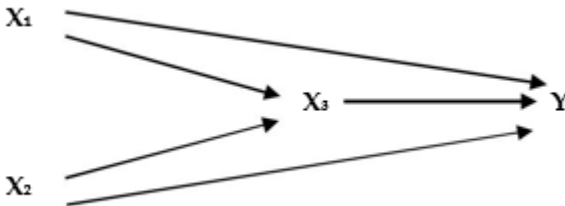
g. Path Paradigm

Research that uses this paradigm will examine the relationship of three independent variables, one of the independent variables functions as an "intervening variable" with one dependent variable. The possibility of the influence of X1 and X2 on Y can be directly, but also the another possibility is that X1 and X2 affect Y after going through X3.

Example:

- Independent variable (X1): IQ
- Independent variable (X2): Learning pattern
- Independent variable (X3): Motivation
- Dependent variable (Y): Learning achievement

The relationship pattern of these variables can be described as follows:



The pattern of relationships between these variables can be explained as follows:

IQ affects learning achievement

Learning patterns affect learning achievement

Motivation affects learning achievement

IQ and learning patterns with intermediary motivation affect learning achievement.

CHAPTER 8

DEVELOPING OPERATIONAL VARIABLE DEFINITIONS

8.1 Importance of Variable Operationalization

Variables must be operationally defined so that the relationship between one variable and another is easier to find and its measurement. Without the operationalization of variables, researchers will experience difficulties in

determining the measurement of the relationship between variables that are still conceptual.

Operationalizing variables is useful for: 1) identifying observable criteria that are being defined; 2) shows that a concept or object might have more than one operational definition; 3) knowing that operational definitions are unique in situations where the definition must be used.

8.2 Operational definitions are based on observable criteria

What is meant by operational definition is a definition based on observable characteristics of what is being defined or "changing concepts in the form of constructs with words that describe behavior or symptoms that can be observed and which can be tested and determined by people others" (Young, quoted by Koentjaraningrat, 1991; 23). The emphasis of the definition of operational definition is on the word "can observed". If a researcher makes an observation of a symptom or object, other researchers can also do the same thing, namely identifying what has been defined by the first researcher.

Unlike the conceptual definition, the conceptual definition is more hypothetical and "not observable". Because conceptual definition is a concept defined by reference to another concept. Conceptual definitions are useful for making the logic of the hypothesis formulation process.

8.3 Ways to Arrange Operational Definitions

There are three approaches to compiling an operational definition, namely called Type A, Type B and Type C.

8.3.1 Type A Operational Definition

Type A operational definitions can be arranged based on the operations that must be performed, so that the symptoms or conditions that are defined become real or can occur. Using certain procedures researchers can make symptoms become apparent. For example: "conflict" is defined as a situation produced by placing two or more people in a situation where each person has the same goal, but only one person will be able to achieve it.

8.3.2 Operational Definition of Type B

Type B operational definitions can be compiled based on how certain objects that are defined can be operationalized, namely in the form of what they do or what composes their dynamic characteristics. For example: "smart people" can be defined as someone who gets high values in his school.

8.3.3 Type C Operational Definition

Type C operational definitions can be arranged based on the appearance of what the object or symptom is defined, namely what constitutes the static characteristics. For example: "Smart people" can be defined as people who have strong memories, mastered several foreign languages, have good thinking skills, are systematic and have the ability to calculate quickly.

8.4. Criteria of Uniqueness

In compiling operational definition, the definition should be able to identify a set of unique criteria that can be observed. The more unique operational definition is, the more useful it will be. Because of the definition of information to researchers, and more often than not, they will not be included in the definition of accidentally and can increase. Even so, the uniqueness / specificity does not become a barrier to its general applicability.

CHAPTER 9 TECHNIQUES FOR MANIPULATING AND CONTROLLING VARIABLES

One characteristic of experimental research is that it allows researchers to manipulate and control variables that cannot be carried out in the types of descriptive or exploratory research. Variable manipulation means that the researcher gives a certain treatment to the independent variables which will have

an effect on the dependent variable. The purpose of manipulating an independent variable is that the researcher wants to see how much the effect of giving different treatment of independent variables on the dependent variable affected. By manipulating independent variables, the researcher will can know which treatment is the most effective result. Controlling variables means that researchers exercise control in such a way that researchers can eliminate the influence of these variables so as not to influence the process of measuring the influence of the variables under study. The purpose of controlling variables is to eliminate the bias that is likely to arise because the influence of these variables is not desired by the researcher. Below will be discussed techniques for manipulating and controlling variables.

9.1 Control Group

One technique in manipulating and controlling variables is by way of making a control group (or comparator) with the existence of a controlling group, the researcher will be able to control the possibility of the emergence of factors that can influence the valid assessment process on the effects of the treatment conditions imposed on the group or object being studied.

9.2 Factors Affecting Internal Validity

In experimental research, if not controlled, it will affect what is called internal validity. External variables that can affect internal validity will be discussed below, including:

9.2.1 History : Factor of history refers to events that are happening in the environment at the same time when the variables being made in the experiment are being tested or carried out measurements. This can be understood by using an example as follows: if a member of a group was having a psychological problem or external pressure to include in the study such as testing a new curriculum on the group, the results of test measurements experimentally may not be reflecting the problems of testing the implementation of the new curriculum but reflect external event factors or called " external historical event "

9.2.2 Selection : The selection process that is not good will result in a group that is being tested there is a difference in the ability to accept, respond, age, type of work and so on. The result is a different response to the treatment being tested. The process of selecting group members who are investigated incorrectly will produce wrong or biased conclusions.

9.2.3 Maturation: Maturation means that there is a process of change that

occurs in the object being studied (respondent) at their time is participating in experimental research. Usually this happens in research that requires a long time. People who are the object of research or respondents constantly change both physically and mentally. Changes that occur in the respondent can result in bias in the measurement results.

- 9.2.4 Testing:** Testing refers to the effects that occur because of a pre-test that precedes the actual test that will be imposed on the respondents. This pre-test activity will affect the respondents in working on the actual test. There is a possibility that there is a tendency for individuals who have pre-tested the results to be better at working on the actual test.
- 9.2.5 Instrumentation:** Instrumentation has the understanding that changes that occur in measurement or observation procedures during the experiment take place. These procedures include tests, mechanical measurement instruments, officers who make observations or those who make judgments. One form of threat that can affect internal validity is for example: if the observation officer, the appraiser or interviewer either intentionally or unintentionally matches the desired research hypothesis. This event allows the officers to direct the respondent in the desired hypothesis.
- 9.2.6 Experimental Mortality:** In a study that requires post-test data, all respondents were included in the study because respondents who resigned from the experimental study differed from respondents who were still active in the group; hence this status difference will give rise to what is called post-test bias (post-test bias) or bias because there is no internal validity based on mortality. For example, in an experimental study, researchers used graduates from two different disciplinary groups, for some reason some members of each group were absent or retreated so that one of the groups lost more members than the other group. Because the number of the two groups is not the same, it will cause bias.
- 9.2.7 Stability:** What is meant by stability bias is that the research findings cannot be scientifically unreliable. This bias can be tested using statistical calculations.

9.2.8 Interactive Combinations of Several Factors: There is also the possibility of the results of research where there is no internal validity caused by several combination factors simultaneously, for example the source loses internal validity due to the interaction of the combination of completion factors and maturation. In determining group selection based on age, some members are mature while other members are still at the stage of physical or mental change.

9.2.9 Hope: What is meant by the expectation factor is the expectation of the researcher to obtain certain research results according to his wishes. In order for the purpose to be achieved, the researcher consciously or unconsciously tries to influence the research process and the object being studied. Such actions can result in a loss of internal validity factors.

9.3 Factors Affecting External Validity: External validity means the existence of a generality or ability to represent (population) the results of research. The results of the study can be applied in the context of time, place and group of people (objects research) that is different. Only studies that have external validity can be said to reflect the population. Below will be discussed several factors that can influence the presence or absence of external validity in the current research.

9.3.1 Reactive Impact of Testing : If the researcher wears a pretest activity that can affect the respondents being studied in an experimental study, then the impact of the treatment can be influenced by some of the pretest's activities. If the pretest is not done, the impact of the treatment will not be the same.

9.3.2 Effects of Selection Bias Interaction : If the researcher makes a mistake in sampling which results in the sample not representing a larger population, the researcher will have difficulty in generalizing his study findings from the sample level to the population. Example: if the researcher takes a sample from a part of city A, then the result will not be valid if applied to the other parts of the city.

9.3.3 Reactive Effects of Experimental Settings : Researchers in conducting experimental arrangements intentionally or unintentionally can create a contrived condition to limit the possibility of research results that can be generalized in testing a treatment that is not experimental.

9.3.4 Multiple Inference Treatment : In conducting the study the researcher gave several treatments simultaneously to the respondents where the treatments could be in the form of experimental or non-experimental treatments; these treatments can interact with various ways so that it can cause representation of the impact of the treatment to decrease.

9.4 Equating Experimental Groups and Controllers: To get good experimental results, researchers need to select the control group members who have similar characteristics with the experimental group members. By doing the selection process, the possibility of losing selection validity will decrease. The following will be given examples of several ways to equalize the experimental group and the control group: a. Randomization: Randomization technique is a procedure to control selection variables without identifying them first. The aim is to avoid the possibility of different types of people being chosen as members in the control group or the controlling group. b. Matching Pair Techniques:

Before using a suitable pairing technique, researchers must first determine which control variables can be applied to different individuals. Usually the variables used are gender, age, socio-economic status, IQ, achievement; while in dependent variables, researchers usually use pretest values. In determining partner members, for example researchers make a partner between one member who is 30 years old with other members who have the same age. All members who are used as research objects are made pairs. So if the researcher needs 50 members it will be 25 pairs. Then by making a random selection one member of each pair will be made a member in the experimental group, while the other members will be made members of the control group. c. Suitable Group Techniques: Using a suitable group technique can be done in the same way as the matching pair technique. In the experimental group certain members are selected using the same variable, for example age; then the control group is selected using the same variable. d. Limiting Population Research samples are basically taken from the population. By limiting population characteristics, researchers will automatically be able to limit the characteristics of the sample. For example, researchers want to do research using the object of college students, it should be restricted, for example only university students, then limited to only university students majoring in engineering. This limitation will produce the same characteristics in the population and if the sample is drawn from the population, the sample will have the same characteristics.

CHAPTER 10

MAKING RESEARCH DESIGN

1.0.1 Introduction

In conducting research one of the important things is to make a research design. Research design is like a road map for researchers who guide and determine the direction of the research process in a correct and appropriate manner in accordance with the objectives set. Without a correct design, a researcher will not be able to do a good research because he does not have a clear direction. In order

to achieve the correct design creation, the researcher needs to avoid potential sources of errors in the overall research process. These errors are:

- a. **Error in Planning:** Errors in planning can occur when researchers make mistakes in compiling designs that will be used to gather information. This error can also occur if the researcher is wrong in formulating the problem. Errors in formulating problems will produce information that cannot be used to solve the problem being studied. The way to overcome this error is to develop a good and correct proposal that clearly specifies the method and value added of the research that will be carried out.
- b. **Error in Data Collection:** Errors in data collection occur when researchers make mistakes in the process of collecting data in the field. This error can increase the level of errors that have occurred due to improper planning. To avoid this, the collected data must be a representation of the population being studied and the data collection method must be able to produce accurate data. The way to deal with this error is to be careful and accurate in carrying out research designs that have been designed in the proposal.
- c. **Error in Analyzing:** Errors in conducting an analysis can occur when the researcher is wrong in choosing how to analyze data. Furthermore, this error is caused by an error in choosing an analysis technique that is appropriate to the problem and available data. The way to overcome this problem is to make a justification of the analytical procedure used to infer and manipulate data.
- d. **Error in Reporting:** Errors in reporting occur if the researcher makes a mistake in interpreting the results of the study. Errors like this occur when giving meaning to the relationships and numbers identified from the data analysis stage. The way to overcome this error is the results of data analysis examined by people who are truly experts and master the problem of the results of the research.

10.2 Types of Research Design

Types of research designs are as follows:

The exploratori research design is used for initial research which functions to explain and define a problem. Early research is not to seek final conclusions. Included in this category are surveys conducted by experts, case studies, analysis of secondary data and research using a qualitative approach.

Conclusive research design is used for descriptive research and ex-experimental research. Descriptive research serves to describe the characteristics / symptoms / functions of a population. The methods used are usually surveys and observations. Descriptive research has the characteristics of a hypothesis, a structured and inflexible design, prioritizing accuracy and understanding of previous problems. Causal research is used to identify causal relationships between variables that function as causes (independent variables) and which variables function as consequential variables (dependent variables).

Broadly speaking, in a conclusive quantitative flow there are two types of designs, namely: Ex Post Facto Design and Experimental Design. The factors that distinguish these two designs are that in the first design there was no manipulation of the independent variables while in the second design there was manipulation of the independent variables. The main purpose of using the first design is exploratory and descriptive; while the second design is explanatory. If viewed in terms of the level of understanding of the problem under study, the ex post facto design results in a level of understanding of the problem under study at the surface level, while experimental designs can produce a deeper level of understanding. The two main designs have more specific sub-designs. Included in the first category are field studies and surveys. While what is included in the second category is an experiment in the field (field experiment) and experiments in the laboratory (laboratory experiment)

10.2.1 Sub Design Ex post Facto

- a. Field Study: Field studies are research designs that combine literature searches, experiential surveys and / or case studies where researchers attempt to identify important variables and relationships between these variables in a particular problem situation. Field studies are generally used as a means of further and in-depth research.
- b. Survey: Survey design depends on the use of the type of questionnaire. Surveys require a large population if researchers want the results to reflect real conditions. The larger the sample, the more surveys provide more accurate results. With a survey a researcher can uncover many problems, even if only on the surface. Even so, surveys are useful if researchers want information that is diverse and diverse. Survey methods are very popular because they are widely used in business research. Another advantage of the survey is that it is easy to implement and can be done quickly.

10.2.2 Experimental Sub Design

- a. Field Experiments: Field experiment design is a study conducted by using a realistic setting where researchers intervene and manipulate independent variables.
- b.
- c. Laboratory Experiments: The laboratory experimental design uses

artificial background in conducting his research. By using this design, researchers intervene and manipulate independent variables and allow researchers to control the main aspects of errors.

10.3 Validity

Validity is related to the problem of limiting or suppressing errors in research so that the results obtained are accurate and useful to implement. There are two validities, namely internal validity and external validity.

- a. Internal Validity : Internal validity is the level at which research results can be trusted truthfully. Internal validity is an essential thing that must be fulfilled if the researcher wants the results of his study to be meaningful. In connection with this, there are several things that become obstacles to obtaining internal validity: a) History: This factor occurs when external events in the investigation conducted affect the results of research. b) Maturation: There are changes that occur in the respondent in a certain period of time, such as increasing age or the existence of fatigue and saturation factors. c) Testing: Effects produced by the process under investigation which can change the attitude or actions of the respondent. d) Instrumentation: Effects that occur due to changes in tools when conducting research. e) Selection: An artificial effect where the selection procedure influences the results of the study. f) Mortality: The effect of the existence, loss or departure of the respondents studied
- b. External Validity : External validity is the degree to which research results can be generalized to populations, settings and other things in similar conditions. Things that become sources of external validity are: a) Testing Interactions: Artificial effects made by testing respondents will reduce generalizations in situations where there is no testing on the respondent. b) Selection Interaction: The effect in which the types of respondents that influence study results can limit their generality. c) Interaction Setting: Artificial effects made using certain backgrounds in the study cannot be replicated in other situations.

10.4 Ex Post Facto and Experimental Specific Designs

Before discussing Ex Post facto and experimental specific designs, the notation system used needs to be known first. The notation system is as follows:

- X: Used to represent the exposure (exposure) of a group that is tested against an experimental treatment on an independent variable which then effects on the dependent variable will be measured .
- O: indicates the existence of a measurement or observation of dependent variables that are being studied in certain individuals, groups or objects.
- R: indicates that individuals or groups have been randomly selected and determined for study purposes.

10.4.1 Ex Post Facto

As mentioned earlier that in the Ex Post Facto design there is no treatment manipulation of the independent variables then the notation system, whether field studies or surveys are only written with O or O more than one.

Example 1: The study was conducted using two populations, namely

Company A and Company B, the notation:

O 1

O 2

Where O 1 is an observation activity carried out in company A and O 2 is an observation activity carried out in company B. For example: We randomly examined 200 companies from a population of 1000 companies regarding their payroll system. The survey was conducted by sending questionnaires to 200 managers, so the design configuration would be as below:

(R) O 1

Where O 1 represents a survey in 200 companies by giving questionnaires to 200 managers selected randomly (R).

If we examine the same sample repeatedly, for example three times in three consecutive months, the notation is:

(R) O 3 where O 1 is the first observation, O 2 is the second observation and O 3 is the third observation.

10.4.2 Experimental Designs

The experimental design was divided into two, namely: pre-experimental (quasi-experimental) and actual experimental design (true experimental). The difference between the two types of design lies in the concept of control.

- a. One Shot Case Study: The simplest experimental design is called One Shot Case Study. This design is used to research one group by being given one treatment and the measurement is done once. The diagram is as follows:

X O

- b. One Group Pre-test - Post-test Design: The second design is called One Group Pre-test - Post-test Design which is a development of the design above. The development is by doing one measurement in front (pre-test) before the treatment (treatment) and after that the measurement is done again (post-test). The designs are as follows:

O 1 X O 2

In this design the researcher makes initial measurements on an object under study, then the researcher gives certain treatment. After that the measurement is done again for the second time. The design can be developed in other forms, namely: "time series design". If the

measurement is done repeatedly in a certain period of time. Then the design will be as below:

O 1 O 2 O 3 XO 4 O 5 O 6

In the time series design, researchers took measurements in front for 3 times in succession, then he gave treatment to the object under study. Then the researchers took measurements again 3 times after the treatment was done.

- c. Static Group Comparison: The third design is Static Group Comparison which is a modification of design b. In this design there are two groups chosen as the object of research. The first group received treatment while the second group received no treatment. This second group functions as a comparison / control group. The designs are as follows:

XO 1 O 2

- d. Post Test Only Control Group Design: This design is the simplest design of the actual experimental design (true experimental design), because the respondents were actually randomly selected and treated and there were the control group. This design has fulfilled the actual experimental criteria, namely by the presence of variable manipulation, random selection of groups studied and treatment selection. The designs are as follows:

(R) XO 1

(R) O 2

The purpose of the design is that there are two groups chosen randomly. The first group was treated while the second group was not. The first group was given treatment by the researcher then carried out measurements; while the second group used as the control group was not treated but only measured.

- e. Pre-test - Post-test Control Group Design: This design is a development of the design above. The difference lies in both the first group and the control group in the pre-test. The designs are as follows:

(R) O 1 XO 2

(R) O 3 O 4

- f. Solomon Four Group Design: This design is a combination of Post Test Only Control Group Design and Pre-test - Post-test Control Group Design which is an ideal design model for conducting controlled experimental research. The researcher can press as little as possible the sources of error because there are four different groups with six

measurement formats. The designs are as follows:

(R) O 1 XO 2

(R) O 3 O 4

(R) XO 5

(R) O 6

The design intent is: The researcher randomly selected four groups. The first group which is the core group is given treatment and two measurements, namely in front (pre-test) and after treatment (post-test). The second group as a control group was not treated, but measurements were taken as above, namely: measurement in front (pre-test) and measurement after treatment (post-test). The third group was treated and only one measurement after treatment (post-test) and the fourth group as the control group of the third group was only measured once.

10.4.3 Advanced Experimental Design

a. Completely Randomized Design: This design is used to measure the influence of an independent variable manipulated on dependent variables. Random group selection is done to get equivalent groups. Case: The directors of a company want to know the influence of three different types of giving instructions made by superiors to subordinates. For the purpose of this study three randomly selected groups of 25 people were selected. Instructions for the first group were given orally, for the second group in writing and for the third group the instructions were not specific. The three groups were given about 15 minutes to think about the situation. Then all three were given objective tests to find out how well they understood the work to be done.

The formulation of this case problem is: Does the manipulation of independent variables affect the understanding of subordinate employees in carrying out their work?

The purpose of this study is to determine which types of instructions can create a better understanding of the work ordered by superiors.

Research Design:

Instruction	A1. (Verbal)	A2. (Written)	A3. Not Specific
	X11	X12	X13
	X21	X22	X23

	X31	X32	X33
	X25,1	X25,2	X25,3
Treatment	x.1	x.2	x.3

b. Random Block Design: This design is an improvement in Random Perfect Design above. In the previous design the differences found in each individual were not considered, resulting in groups that had different characteristics. So that the design that we make can produce good output, it is necessary to choose group members (respondents) who come from populations that have the same characteristics. Therefore researchers must be able to identify some of the main sources of the intended differences early.

Examples of Design:

Treatment				
	Experimental Group		Control Group	
Instruksi Blok (Departement)	A1. (Verbal)	A2. (Written)	A3. Not Spesifik	Average Blok
B1	5 (Workers)	5 (Workers)	5 (Workers)	X1.
B2	5 (Workers)	5 (Workers)	5 (Workers)	X2.
B3	5 (Workers)	5 (Workers)	5 (Workers)	X3.
B4	5 (Workers)	5 (Workers)	5 (Workers)	X4.
B5	5 (Workers)	5 (Workers)	5 (Workers)	X5.
Average Treatment	x.1	x.2	x.3	

The above design can be explained as follows: At the time the study was conducted using the previous design, members from three groups came from different backgrounds. Member background differences are a nuisance or are referred to as interfering variables. For this reason, it is necessary to equalize the members of each group. The trick is to create blocks that function to get members of the same group. In this case the block is determined based on the department (section) where the group members originate. Furthermore, workers from the same department are divided into five based on their respective departments. Then each group received the same treatment, namely the first group received oral instructions, the second group received written instructions and the third group the instructions were not specific. By using this design, the researcher will be able to see the effects caused by the system of blocks per department and the interaction of instructions for the three groups.

c. Latin Square Design: This design is used to control two confounding variables at once. In connection with the above case, there is still one other confounding variable, namely "the ability of workers". The variable capabilities of our workers divide into three levels, namely: high ability, medium ability and low ability. These three levels of capability variables are then placed in the rows and columns of the *Latin Square* model . This design consists of three rows and three columns. Then randomly taken 3 employees from each department.

The design is as below:

Ability of Workers

Block	c1 Height	c2 Intermediate	c3. Low	Average
B1	(a1) x1	(a2) x1	(a3) x1	X1 ...
B2	(a2) x2	(a3) x2	(a1) x2	X2 ...
B3	(a3) x3	(a1) x3	(a2) x3	X3 ...

c. Factorial Design: *Factorial* design is used to evaluate the impact of the combination of two or more treatments on dependent variables. In the case below, *factorial* analysis was applied using a perfect random design with 3 rows and 3 columns. The research case is as follows: researchers want to see two independent variables, namely the variable "level of contrast" and "line length" of an ad. Contrast levels are manipulated to "low", "medium" and "high"; while the length of the line is manipulated to "5 inches", "7 inches" and "12 inches". The designs are as follows:

Contrast Level

Line Length	B1. Low	B2. Medium	B3. High	Average Treatment
A1. 5 inches	X1			x ..1
A2. 7 inches		X2		x ..2
A3. 12 inches			X3	x ..3

Average	x.1.	x.2.	x.3.	
Treatment				

The design table above X1 means the respondent who gets treatment reads the and with a 5 inch line length and a low color contrast level; X2 means the respondent who gets the treatment to read the ad with a 7 inch line length and medium color contrast level and X3 means the respondent who gets the treatment to read the ad with a 12 inch line length and high color contrast level. From the format above we will get 9 different combinations.

CHAPTER 11 MEASUREMENT SCALE

There are four types of measurement scales in the study, namely nominal, ordinal, interval and ratio.

11.1 Nominal: The nominal measurement scale is used to classify objects, individuals or groups; for example classifying gender, religion, occupation, and geographical area. In identifying the above numbers are used as symbols. If we use a nominal measurement scale, non-parametric statistics are used to analyze the data. The results of the analysis are presented as a percentage. For example, we classify gender variables as follows: we give the symbol number 1 and woman number 2. We cannot do arithmetic operations with these numbers, because these numbers only indicate the presence or absence of certain characteristics. For example: The answer to the question in the form of two choices "yes" and "no" that are categorical can be given numeric symbols as follows: the answer "yes" is given the number 1 and is not given the number 2. For example in the question: Do you agree about abortion? Answer: a. yes and b. not. If a nominal scale is used, then "yes" is given a value of 1 and "no" is given a value of 0

11.2 Ordinal: The ordinal measurement scale provides information about the relative number of different characteristics possessed by certain objects or individuals. This level of measurement has nominal scale information added by certain relative ranking facilities that provide information on whether an object has more or less characteristics but not how many shortcomings and strengths it has. For example: Answers to questions in the form of ratings, for example: strongly disagree, disagree, neutral, agree and strongly agree can be given the symbols number 1, 2,3,4 and 5. These numbers are only a symbol of rank, do not express the amount. For example in the question: Do you agree about abortion? Answer: a. strongly disagree, b. disagree, c. hesitant, d. agree, e. totally agree. If an ordinal scale is used, then "strongly disagree" is given a value of 1, "disagree" is given a value of 2, "doubt" is given a value of 3, "agrees" is given a value of 4 and "agrees completely" is given a value of 5

11.3 Interval: Interval scale has characteristics such as those owned by nominal and ordinal scales with added other characteristics, namely in the form of a fixed interval. Thus researchers can see the magnitude of the differences in characteristics between one individual or object with another. The interval measurement scale is really a number. The numbers used can be used can be done arithmetic operations, for example summed or multiplied. For doing analysis, this measurement scale uses parametric statistics. For example: The answer to the question concerns the frequency of questions, for example: How many times have you visited Jakarta in one month? Answer: 1 time, 3 times and 5 times. Then the numbers 1,3, and 5 are the actual numbers using intervals 2. For example in the question: How many times did you shop at this supermarket in one month? The answer is in the form of actual numbers: a. 1 time, b. 2 times, c. 3 times, d. 4 times and e. 5 times

11.4 Ratio: The measurement scale ratio has all the characteristics possessed by the nominal, ordinal scale and intervals with excess scale that have absolute 0 (zero) empirical values. The zero absolute value occurs when the absence of a characteristic is being measured. Ratio measurement is usually in the form of a comparison between one individual or certain object with another. For example: A

weight 35 Kg medium weight B 70 Kg. Then B weight compared to A weight is equal to 1 compared to 2. For example in questions: What is your weight before and after eating these diet drugs? The answer is the actual number: Weight before taking medicine 70 kg and heavy after taking medicine 60 kg.

11.5 Attitude Measurement Scale

There are four scales of attitude measurement according to Daniel J Mueller (1992), namely: 1) Likert attitude scale, 2) Thurstone scale, 3) Guttman scale, and 4) semantic differences.

- a. Likert Attitude Measurement Scale: Likert scale is used to measure attitudes in a study. What is meant by attitude according to Thurstone is "1) influence or rejection, 2) assessment, 3) likes or dislikes, 4) positivity or negativity of a psychological object". Usually the attitude on a Likert scale is expressed starting from the most negative, neutral to the most positive in the following forms: strongly disagree, disagree, not know (neutral), agree, and strongly agree. To do quantification, the scale is then given numbers as symbols so that calculations can be made. Generally giving the number code as follows: "strongly disagree" given number 1, "disagree" given number 2, "do not know (neutral)" given number 3, "agree" given number 4, and "strongly agree" given number 5. Of course the values of these numbers are relative because they are only symbols and not actual numbers. For Example 1: In this example a statement that is positive, neutral and negative is written. Positive statement: I prefer to have a Honda brand car. Neutral statement: Many Honda brand cars are on the market. Negative statement: Honda brand cars are generally expensive. Example 2: In this example positive, neutral and negative attitude statements are applied in certain cases, namely in research on attitudes towards drugs.

Commands: Choose one appropriate answer using the following answer categories:

- A. = strongly agree
- B. = agree
- C. = uncertain / do not know
- D. = disagree
- E. = strongly disagree

1. There will be no people who think healthy using drugs (N)
2. Use of Narcotics leads to the use of heroin (N) –
3. Use of Narcotics causes children born to become disabled (N) –
4. Narcotics are not "hard" drugs. (P) –
5. Narcotics have the potential for psychological therapy (P) –

6. Narcotics cause a decrease in the user's humanity

Note: N is a negative attitude statement, and P is a statement of positive attitude.

The scoring process uses the following figures: or very agree worth 5, agree worth 4, uncertain value 3, disagree worth 2 and strongly disagree worth 1.

- b. Thrustone Scale: The Thurstone scale is the first attitude scale developed in attitude measurement. This scale has three attitude scaling techniques, namely: 1) pair comparison method, 2) same emergence interval method, and 3) sequential interval method. These three methods use presumptive path considerations that assume the relative positivity of the attitude statement towards an object.
- c. Guttman's scale: The Guttman scale is arranged based on the degree of positivity with an emphasis on unidimensional aspects. This aspect places the respondent at a certain point in a continuum of attitudes that must agree with all the statement items below and must disagree with all items above the scale position. For example: Below is an example of the Guttman scale applied in the problem of cheating among students. The statement is composed of five items as follows:

- 1) Cheating can be accepted in all circumstances
- 2) cheating is a habit that can be accepted among students
- 3) Cheating is permitted in urgent circumstances
- 4) cheating is acceptable if students do not study
- 5) cheating can be accepted if students are urged to drop out

If the respondent agrees with opinion number 1 then the person concerned must agree with all choices under number 1. If the respondent does not agree to statement number 1, but agrees with number 2, then he must agree with numbers 3,4 and 5.

- d. Semantic difference:
The semantic difference was invented by Osgood to measure the attributes given by respondents to several meanings to describe certain objects. In measuring this, adjectives are usually used which have opposite meanings.

For Example:

This example is used to measure three dimensions of meaning, namely: 1) measuring the evaluation dimension by using four adjective pairs, 2) measuring the potential dimensions by using as many as three adjective pairs and 3) measuring the dimensions of activity using as many as three adjective pairs. What is your opinion about Supermarket X?

Quick Service ---!--- !---!---!---!---!---!---!---!---!--- Slow Service

Clean Shopping Place	---!--- !--!---!---!---!---!---!---!---	Dirty Shopping Place
New Product	---!--- !--!---!---!---!---!---!---!---	Old Product
Low Price	---!--- !--!---!---!---!---!---!---!---	High Price
Spacious Parking Friendly Employees	---!--- !--!---!---!---!---!---!---!---	Narrow Parking Employee Not Friendly
Lots of Choices	---!--- !--!---!---!---!---!---!---!---	Little Choice
Spacious Room	---!--- !--!---!---!---!---!---!---!---	Narrow Room
Comfortable	---!--- !--!---!---!---!---!---!---!---	Not Comfortable
Safety	---!--- !--!---!---!---!---!---!---!---	Not Safety

11.6 Validity

A measurement scale is said to be valid if the scale is used to measure what should be measured. For example a nominal scale that is non-parametric is used to measure nominal variables not to measure parametric interval variables. There are 3 (three) types of measurement validity that must be known, namely:

- a. Content Validity: Content validity involves the degree to which scale items reflect the domain of concepts being studied. A domain of certain concepts cannot just be calculated in all its dimensions, because the domain sometimes has many attributes or is multidimensional.
- b. Validity of Construct Validity: Construct validity is related to the degree to which the scale reflects and acts as the concept being measured. The two main aspects of construct validity are naturally theoretical and statistical.
- c. Criterion Validity: The validity of the criteria concerns the level problem where the scale being used is able to predict a variable designed as a criterion.

11.7 Reliability

Reliability refers to the consistency and stability of the value of a particular measurement scale. Reliability concentrates on the problem of measuring accuracy and results

CHAPTER 12

DATA COLLECTION INSTRUMENT DEVELOPMENT

12.1 Definition

Primary data collection requires an instrument. In this section we will discuss how to make questions using a questionnaire. In preparing the questionnaire there are several considerations that must be done, namely: a. To what extent can a question influence the respondent to show a positive attitude towards the things being

asked? b. To what extent can a question influence the respondent to volunteer to help the researcher find the things that the researcher will look for? c. To what extent does a question dig up information that the respondent himself does not believe in the truth?

The validity of the questionnaire is determined by the three criteria above. Besides that the question format and answer model will also determine the quality and accuracy of the respondent's answers. The question format is divided into two, namely: a. How questions are asked (Question Format); b)How are these questions answered (Answer Model).

12.2 How Are These Questions Submitted? (Question format)

The format of questions is as follows:

a. Direct Questions v.s Indirect Questions: The fundamental difference between Direct Questions and Indirect Questions is the level of clarity of a question in revealing specific information from respondents. Questions Directly ask specific information directly with no direct (direct). Indirect Questions ask specific information indirectly (indirect); however the core of the question is the same.

For example:

Direct Questions:

- a. Do you like work now?
- b. Do you agree with the increase in telephone rates?

Indirect Questions:

- a. What do you think of the work that is currently in?
- b. What do you think about the increase in telephone rates?

b. Special Questions v.s Frequently Asked Questions: Specific Questions ask specific questions about the respondent which causes the respondent to be aware or intrigued so that the person will give a dishonest answer. Moderate General Questions usually ask for information sought in an indirect and general way, so that respondents are not very aware of it.

For example: Special Questions:

- a. Do you like the job of operating the production machine?
- b. Do you agree with the 10% increase in Telkom's DLD telephone rates?

Frequently Asked Questions:

- a. Do you like working at the company?
- b. Do you agree with the increase in Telkom's DLD telephone rates?

c. Questions About Facts v.s Questions About Opinion

c. Questions About Facts will require answers from respondents in the form of facts, while Questions About Opinions require answers that are opinions. In practice, because the respondent may have a memory that is neither strong nor conscious, the one who wants to create a special impression, then the Question About the Facts does not necessarily fully produce factual answers. Likewise with questions that ask for opinions may not necessarily produce answers that express honest opinions. This happened because respondents distorted their opinions based on the existence of "social pressure" to adjust to their social and environmental desires.

For Example:

Questions About Facts:

- a. What brand of car do you have now?
- b. What is the price of gasoline per liter today?

Questions About Opinion:

- a. Why do you like Honda brand cars?
- b. Why do you say the price of gasoline is cheap?

d. Questions in Sentence Form Tanya v.s. Questions in the Sentence Form

Statement: Questions in the Form of Sentences Questions provide questions directly to respondents; while the Question in the Form of Sentences The statement provides the answer to his agreement.

For example:

Questions in the Form of Sentences Question:

- a. Do you agree with the increase in fuel prices?
- b. Do you agree with divorce?

Questions in the Form of Statement Sentences:

1. The price of fuel will be raised. The answer: a. Agree b. Disagree
2. Many artists do divorce. The answer: a. Agree b. disagree

12.3 How Questions Must Be Answered

In this section we discuss the models for answering questions.

- a. Unstructured Answer: This answer model is not structured usually also referred to as open questions. This answer provides an opportunity for residents to answer questions freely and express their opinions. The advantage of using this answer model is that researchers can obtain complete information from respondents; however this model has weaknesses including the researchers will experience difficulties in processing information because of the large amount of information data. Besides that the processing takes a

lot of time and the researcher will have difficulty in the scoring process. For example: Tell me how you feel about the problem of rising fuel prices What do you think about the increase in fuel prices?

- b. Field Answer: This answer model is a form of transition from unstructured to structured question answer model. Although respondents were given opportunity to give an open but limited response because model the question. For example: What is your work? Which university did you graduate from?
- c. Tabulation Model Answers: This answer model is similar to answer answers but more structured because the respondent must fill in the answer in a table. Form tables like this make it easier for researchers to organize answers complex.
- d. Answers to Scale: This answer model is another structured answer model where respondents were asked to express their approval or acquisition to the question given. For example 1: If you experience difficulties in what work will you do it?

Will Stop Working	Might Stop Working	Take seriously but continue to work	No Problem
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- e. Answer ranking : This answer model asks respondents to rank several statements based on their level of importance in a sequential form based on priorities. The result is that researchers will obtain ordinal data.

For Example: ranking of these activities in relation to new product launches Doing market research on making products, product designing, advertise product launch products

- f. Answer Form Checklist
The checklist answer asks the respondent to answer by choosing one of the possible answers provided. The form of the answer is not in the form of scale but in form nominal category. This form saves a lot of time for both respondents and researchers.

Example: What type of work do you like the most?

1. Work that matches my abilities so that I can work optimally.
2. Work that forces me to work with my limited abilities.
3. work that generates a lot of money even though it is not in accordance with my ability.

g. Categorical Answers

This answer model is similar to the answer checklist, but the form is simpler and only provides two alternative answers. Answers like this will provide data that is nominal.

Example:

Are you a hard-working person? a. yes b. Not

Working discipline and order is good. a. right b. Wrong

12.4 Selecting the Model Answer

Making questions based on the answer model requires consideration based on the data type we need and also the consideration of the advantages and disadvantages.

Based on the answer model the researcher can also determine the data needed in relation to the measurement scale.

Example: What is your opinion regarding the increase in prices of food staples?The answer model that produces a nominal type of data

a. agree; b. Disagree

The answer model that produces an ordinal scale type of data

a. strongly disagree; b. disagree; c. neutral; d. agree; e. totally agree

The answer model that produces interval type data

1

Disagree Agree

10

Agree

What is the increase in the price of basic commodities that you agree to the Answer Model that produces an interval type of data

a. 2% c. 6% e. 10%

b. 4% d. 8%

What is the price of a Bandung train ticket - Jakarta do you want for business and executive classes?

The answer model produces a type of scale data ratio

Executive Class	Bussiness Class
a. Rp.60.000	Rp.40.000
b. Rp.80.000	Rp.40.000
c. Rp.120.000	Rp.40.000

CHAPTER 13

SAMPLE DESIGN

13.1 Definition of Terms

Before conducting the sampling process, we need to learn first some basic terminology in the sampling technique.

- a. Element: element is the unit from which the required data is collected. An element can be analogous to the unit of analysis. An analysis unit can show an organization, object, inanimate object or individual.

- b. Population: population is defined as a complete set of analysis units that are being studied.
- c. Unit Sampling: sampling units are different elements / not overlaps of a population. A sampling unit can be an individual element or a set of elements.
- d. Sampling Framework: sampling frame is a physical representation of objects, individuals, or groups that are important for the development of the final sample studied and is a real list of sampling units at various stages in the selection procedure.
- e. Samples: samples are sub of a set of elements chosen to be studied.
- f. Parameters and Statistics: parameters related to a brief description of a selected variable in a population; while statistics are a brief description of the variables chosen in the sample.
- g. Sampling Errors: sampling errors are related to procedural errors in taking samples and inaccuracies in relation to the use of statistics in estimating parameters.
- h. Statistical and Sample Efficiency: Statistical efficiency is a measure in comparing sample designs with the same sample size that assesses designs which can produce a smaller estimated standard error rate. Sample efficiency refers to a characteristic in sampling which emphasizes the existence of high precision and low cost per unit to get each fixed precision unit.
- i. Sampling Planning: sampling planning is a formal specification of the methods and procedures that will be used to identify selected samples for study purposes.

13.2 Sampling Process

The sampling process is our ways of choosing samples for a particular study. The process consists of several stages as follows:

a. Stage 1: Select Population

The initial process is to determine the population that is interesting to learn. A good population includes explicit designs of all the elements involved which usually include four components, namely: elements, sampling units, scope of scope and time.

b. Stage 2: Select Sampling Units

Sampling units are units of analysis from which samples are taken or originated. Due to the complexity of the research and the large number of sample designs, the selection of sampling units must be done carefully.

c. Stage 3: Selecting the Sampling Framework

The choice of sampling frame is an important step because if the sampling frame is adequately chosen not to represent the population, then the generalization of the results of the study is dubious. The sampling frame can be a list of population names such as a telephone book or other name data base.

d. Stage 4: Choosing a Sample Design

Sample design is a type of method or approach used to select study analysis units. The sample design should be chosen according to the research objectives.

e. Stage 5: Selecting Sample Size

The sample size depends on several influencing factors including: Homogeneity of sample units: In general, more like sample units; in a population the smaller the sample needed to estimate population parameters. Trust: Trust refers to a certain level where the researcher wants to be sure that the person predicts the correct population parameters correctly. The higher the level of trust desired, the greater the sample size needed. Precision: precision refers to the size of the standard error of estimation. To get great precision, a large sample size is needed. The Power of Statistics: This term refers to the ability to detect differences in hypothetical testing situations. To get high strength, researchers need large samples. Procedure Analysis: The type of analysis procedure chosen for data analysis can also influence sample size selection. Costs, Time and Personnel: The choice of sample size must also consider costs, time and personnel. Large samples will demand large fees, a lot of time and large personnel too.

f. Stage 6: Selecting the Sampling Design

The sampling design determines operational procedures and methods to get the desired sample. If well designed, sampling design will guide the researcher in choosing the sample used in the study, so that the errors that will appear can be reduced as small as possible.

g. Stage 7 Choosing Samples:

The final stage in this process is the determination of samples to be used in the next research process, namely data collection.

13.3 Sample Design

Broadly speaking there are two main sample designs, namely Probability Design and Non-Probability Design. Each category has smaller sub-categories. In this discussion, we will start with probability design.

a. Simple Random Sampling: The method of sampling with this technique is to give a different number to each member of the population, then choose a sample using random numbers. The advantage of using this technique is that the researcher does not need knowledge of the previous population to be free from the classification errors that might occur; and the data is easily analyzed and errors can be calculated. Weaknesses in this technique are: researchers cannot use the knowledge they have about the population and the level of error in determining a larger sample size.

b. Systematic Random Sampling: This technique is the development of previous techniques only the difference between this technique is using natural sequences. The trick is select randomly starting from number 1 and the closest integer to the sampling ratio (N / n); then select items with intervals from the nearest integer to the sampling ratio. The advantage of using this sample is that the researcher simplifies the sampling process and is easy to check; and reduce sample diversity. The disadvantage is that if the interval is related to the periodic sequencing of a population, there will be sample diversity.

c. Random Multistage Sampling: This design is a variation of the design above

but is more complex. The trick is to use a random sample form with at least two stages. The advantages are the sample list, identification, and numbering needed only for the members of the sampling unit selected in the sample. If the sampling unit is defined geographically it will save more costs. The disadvantage is that the error rate will be high if the number of sampling units chosen decreases.

d. Stratified Random Sampling

Proportional: The method of sampling is done by selecting each sampling unit according to the size of the sampling unit. The advantage is that the representative aspects are more convincing according to the characteristics that form the basis of the units that classify them, thereby reducing their diversity. Characteristics of each strata can be estimated so that comparisons can be made. The disadvantage is that it requires accurate information on the proportion of the population for each stratum. If this is ignored, an error will appear. Disproportional The sampling strategy is proportional. The difference is that the sample size is disproportionate to the size of the sampling unit because of the importance of the analysis and conformity.

e. Cluster Sampling Techniques: The sampling strategy is done by selecting sampling units using a specific form of random sampling, the final units are certain groups, select the groups randomly and count each group. The advantage of using this technique is that if the clusters are based on geographical differences, the cost of the research will be cheaper. Cluster and population characteristics can be estimated. The disadvantage is that it requires the ability to uniquely distinguish each member of the population against the cluster, which will cause the possibility of duplication or removal of certain individuals.

f. Stratified Cluster Sampling Techniques: How to select samples by randomly selecting clusters for each sampling unit. The advantage is to reduce the diversity of simple cluster sampling. The disadvantage is that the characteristics of the Christian cluster can change so that the profits can be lost because it cannot be used for subsequent research.

g. Repetition: Two samples or more of the above clusters (F) are taken by using the results from the sample that were earlier to design the next samples. The advantage of using this technique is to provide estimates of population characteristics that facilitate efficient performance for subsequent samples. Weakness this technique is counting and analysis will be done repeatedly. Sequential sampling can only be used if a small sample can reflect the population.

h. Non Probability Design

1. Judgment: Select samples from a population based on available information, so that representation of the population can be accounted for. The advantage is that the last selected units can be chosen so that they have many similarities. The disadvantage is the emergence of diversity and biased estimates of the population and sample chosen.
2. Convenience: Select analysis units in a manner deemed appropriate by the

researcher. The advantage is that it can be done quickly and cheaply. The disadvantage is that it contains a number of systematic errors and unknown variables

3. Snowball Technique: Select units that have rare characteristics and additional units indicated by previous respondents. The advantage is only used in certain situations. The disadvantage is that representation of rare characteristics can not be seen in selected samples.

13.4 How to determine sample size

One way to determine the sample size developed by Isaac and Michael using a statistical approach for error rates of 1%, 5% and 10% can be done with the following formula:

$$S = \frac{\lambda^2 \cdot N \cdot P \cdot Q}{d^2(N-1) + \lambda^2 \cdot P \cdot Q}$$

Where:

α^2 with Degree of Freedom = 1,

error rate of 1%, 5% and 10%;

P = Q = 0,5;

D = 0,05; and

S = Total sample

Based on the above formula and assumed a population with a normal distribution is made a table to determine the sample size of the population between 10 to 1,000,000 with an error rate of 1% (0.01), 5% (0.05) and 10% (0, 1). For example: If the population is 280, then the sample will be 197 with an error rate of 1%, and sample 155 with an error rate of 5% and sample 138 with an error rate of 10%. The greater the level of error tolerated, the smaller the number of samples taken. Conversely the smaller the level of error that is tolerated, the greater the approach to the sample population to be taken. A list of population and samples is shown in table 13.1.

Table 13.1 Provisions for the Amount of Samples with the Specific Number of Populations with an Error Rate of 1%, 5% and 10%

	S			N			N			S		
	1%	5%	10%		1%	5%	10%		1%	5%	10%	
130	109	95	88	950	391	255	211	300000	662	348	270	
140	116	100	92	1000	399	258	213	350000	662	348	270	
150	122	105	97	1100	414	265	217	400000	662	348	270	
160	129	110	101	1200	427	270	221	450000	663	348	270	
170	135	114	105	1300	440	275	224	500000	663	348	270	
180	142	119	108	1400	450	279	227	550000	663	348	270	
190	148	123	112	1500	460	283	229	600000	663	348	270	
200	154	127	115	1600	469	286	232	650000	663	348	270	
210	160	131	118	1700	477	289	234	700000	663	348	270	
220	165	135	122	1800	485	292	235	750000	663	348	270	
230	171	139	125	1900	492	294	237	800000	663	348	271	
240	176	142	127	2000	498	297	238	850000	663	348	271	
250	182	146	130	2200	510	301	241	900000	663	348	271	
260	187	149	133	2400	520	304	243	950000	663	348	271	
270	192	152	135	2600	529	307	245	1000000	663	348	271	
								∞	664	349	272	

Source: Sugiyono (2002)

If you want to be calculated by a formula, use the formula below:

$$n = \frac{N}{N(d)^2 + 1}$$

Where :

n = Sample

N = Population

d = Degrees of Freedom For example: 0.1; 0.05 or 0.01

Example:

$$N = 702$$

$$n = \frac{702}{702(0,1)^2 + 1}$$

$$n = 87,53$$

Using the Cochran Formula with the Present Writer's Calculation Proportional Approach

$$n = \hat{P}(1 - \hat{P}) \left[\frac{Z_{\alpha/2}}{E} \right]^2$$

where:

n = Sample

$$Z_{\alpha/2} = 1,96 \text{ (From Table Z with } \alpha \text{ as much as 0.05)}$$

How to calculate:

α as much as 0.05 is divided by 2 = $0,05/2 = 0,025$

$$0,5 - 0,025 = 0,475$$

See table Z with α (probability (p)) as much as 0.475 thus the value of Z is as much as 1.96

\hat{P} = Probability is determined as much as 0.5

E = Error rate as much as 0.1

$$n = 0.5 (1-0.5) \left[\frac{1,96}{0,1} \right]^2$$

$$n = 96.04$$

Average Approach

$$n = \left[\frac{Z_{\alpha/2} \cdot \sigma}{E} \right]^2$$

where:

n = sample

$$Z_{\alpha/2} = 1,96 \text{ (the value of table } \alpha \text{ as much as 0.05)}$$

E = error rate is determined as much as 0.1

α = standard deviation is determined as much as 0,5

$$n = \frac{1,96 \times 0,5^2}{0,1}$$

0,1

$$n = 96,04$$

$$n = 96$$

CHAPTER 14 DATA COLLECTION

14.1 Definition

Data collection is an important step in the research process, because only by getting the right data will the research process take place until the researcher gets an answer from the formulation of the problem that has been determined. The data we are looking for must be in accordance with the research objectives. With the right sampling technique, we have got the strategies and procedures that we will use in finding data in the field. In this section, we will discuss what types of data we can use for our research. The first is secondary data and the second is primary data.

Secondary data is data that is readily available so that we are just looking for and gathering while the primary data is data that we can only obtain from the original or first source. If we can get secondary data more easily and quickly because it is available, for example in libraries, companies, trade organizations, statistical center bureaus, and government offices, the primary data must be taken directly from the original source, through the right resource person and what we made in our research.

14.2 Considerations in Finding Secondary Data

Even though secondary data is physically available in searching for the data we cannot do it carelessly. To get the right data and in accordance with the research objectives, we need several considerations, including the following: a. The type of data must be in accordance with the objectives of the research that we have previously determined. b. Secondary data needed is not stressed on quantity but on quality and suitability, therefore researchers must be selective and careful in choosing and using it. c. Secondary data is usually used as a support for primary data, therefore sometimes we cannot only use secondary data as the only source of information to solve our research problems.

14.3 Use of Secondary Data

Secondary data can be used for the following things:

- a. **Problem Understanding:** Secondary data can be used as a supporting tool to understand the problem we are examining. For example, if we are going to do research in a company, the company provides a company profile or other administrative data that we can use as a trigger to understand the problems that arise in the company and which we will use as research problems.
- b. **Explanation of the Problem:** Secondary data is very useful to clarify the problem and become more operational in research because it is based on available secondary data, we can know the components of the environmental situation surrounding it. This will be easier for researchers to understand the problem will be examined, specifically getting a better understanding of experiences that are similar to the problems to be studied
- c. **Alternative Formulations for Resolving Proper Problems:** Before we

make a decision, sometimes we need several other alternatives. Secondary data will be useful in raising several other alternatives that support the resolution of the problem to be studied. With the more information we get, solving problems will be much easier.

- d. **Solution to the Problem:** Secondary data besides providing benefits in helping to define and develop problems, secondary data can sometimes also bring up solutions to existing problems. Not infrequently the problem we will examine will get the answer based solely on secondary data.

14.4 Secondary Data Search Strategy

How do we look for secondary data? In looking for secondary data we need a systematic strategy so that the data we get is in accordance with the problems to be studied. Some stages of the secondary data search strategy are as follows:

- a. **Identifying Needs:** Before the secondary data search process is carried out, we need to identify needs first. Identification can be done by making questions as follows: 1) Do we need secondary data in solving the problem to be examined? 2) What secondary data do we need? Identifying the secondary data we need will help speed up the search and save time and money.
- b. **Choosing a Search Method:** We need to choose a secondary data search method whether it will be done manually or done online. If done manually, we must determine the search strategy by specifying potential data locations, namely: internal location and / or external location. If the search is done online, then we need to determine the type of search strategy, then we choose the information provider services or data base that matches the problem we will examine.
- c. **Filter and Collect Data:** After we determine the secondary data search method, the next step is to do the screening and data collection. Filtering is done so that we only get secondary data that is just right, while what we don't fit can be ignored. After the screening process is complete, data collection can be carried out.
- d. **Data Evaluation:** The collected data needs to be evaluated first, especially with regard to the quality and adequacy of the data. If the researcher feels that the quality of the data has been felt well and the amount of data is sufficient, then we can use the data to answer the problem we will examine.
- e. **Using Data:** The final stage of the data search strategy is to use the data

to answer the problem we are researching. If data can be used to answer problems that have been formulated, then the next action is to complete the research. If the data cannot be used to answer the problem, then the search for secondary data must be done again with the same strategy.

14.5 Selecting Data Collection Methods

Secondary data retrieval should not be done carelessly, therefore we need certain methods. The methods of data collection can be done in a manner; a) manual, b) online and c) a combination of manual and online.

a. Manual Search: Until now there are still many organizations, companies, offices that do not have a complete data base that can be accessed online. Therefore, we still need to do a manual search. Manually searching can be difficult if we don't know the method, because there is a lot of secondary data available in an organization, or vice versa because there is little data available. The most efficient way is to look at the index book, bibliography, references, and literature in accordance with the problems to be studied. Secondary data from the researcher's point of view can be classified into two: internal data data is data that is already available in the field, and external data is data that can be obtained from various other sources.

Internal Location: Internal location can be divided into two sources of information derived from a special data base and general data base. Special databases usually contain important company information that is usually kept confidential and not provided to the public, for example, accounting data, finance, HR, sales data and other important information that may only be known by certain people in the company. This type of data will help a lot in detecting and providing solutions to the problems that we will examine in the company. Instead, the general data base contains data that is not confidential to the company and may be known by the public. This type of data can usually be found in the office / company library or stored on a computer that is generally accessible. This data is obtained from outside the company usually in the form of government regulatory documents regarding trade, news, company journals, company profiles and other general data.

External Location: External data can be easily searched because usually this data is stored in public libraries, libraries of government or private offices and universities, statistical center bureaus and trade associations, and is usually already in a standard form that is easy to read, such as research instructions, register libraries, encyclopedias, dictionaries, index books, statistical data books and other similar books.

b. Online Search: With the development of Internet technology, there are many data bases that sell various business and non-business information. This data base is managed by a number of service companies that provide information and data for business and non-business purposes. The aim is to make it easier for companies, researchers and other users to search for data. Online search provides many benefits for researchers, including: a) saving time: because we can do it just by sitting in front of a computer, b) completeness: through certain Internet media

and portals we can access information available at any time without time constraints , c) Conformity: researchers can search for sources of data and information that are suitable easily and quickly, d) saving costs: by saving time and getting information that is fast means that we save a lot of costs.

14.6 Criteria in Evaluating Secondary Data

The accuracy of selecting secondary data can be evaluated by the following criteria: Time of Applicability: Does the data have validity time? Can we get data when needed. If when needed data is not available or has expired, then it should not be used again for our research. Conformity: Does the data match our needs? Suitability relates to the ability of the data to be used to answer the problem being studied. Accuracy: Can we know the sources of errors that can affect the accuracy of the data, for example, can the data source be trusted? How was the data collected or what method was used to collect the data? Cost: How much does it cost to get the secondary data? If the cost is far more than the benefits, we should not need to use it.

14.7 Primary Data Collection

a. Understanding: What is primary data? Primary data is data originating from the original or first source. This data is not available in compiled form or in the form of files. This data must be searched through the resource person or in the technical terms of the respondent, that is, the person we made as the object of research or the person we made as a means of obtaining information or data. To collect primary data a method called survey is required and uses certain instruments. The survey is useful in providing fast, efficient and appropriate ways of assessing information from respondents. In principle there are two primary data collection techniques, namely: passive data collection and active data collection. The difference between the two techniques is: the first involves observing the characteristics of the elements being studied by humans or machines; while the second covers the search for respondents conducted by humans or non-humans.

Passive data collection is useful for getting data from humans or other types of study elements. Its activities include observing certain characteristics of individuals, objects, organizations and other entities that are of interest to them we examine. Active data collection requires respondents to get data. In the search for primary data there are three important dimensions that need to be known, namely: confidentiality, structure and method of collection. First, confidentiality covers whether the research objectives are known to the

respondent or not. Keep the research objectives secret for the purpose that the respondents did not give biased answers to what we expected. Second, the structure is related to the level of formality (official), or the search for data is done in a structured or unstructured manner. Search is done in a structured manner if the researcher searches for data using a tool, for example a questionnaire with questions that have been systematically designed, and is very structured whether done in writing or verbally. Instead the search can be done in an unstructured way,

if the instrument is made not so formal or structured. Third, the collection method refers to the means to obtain data.

b. Passive Primary Data Collection Method: The primary data collection method can be done by humans or machines. If done by humans it can be in the form of 1) structured and confidential, 2) structured and open, 3) unstructured and confidential, and 4) unstructured and open. The same division if done by the machine.

Methods of collecting data implemented by humans are as follows: 1. Structured and Confidential: this method has characteristics, namely collection is done in a structured or official manner and the respondent is not informed about the purpose of the research conducted. Even so the researchers usually provide information about the theme or topic to be studied so that the respondent cannot answer the questions in the questionnaire. 2. Structured and Open: this method has characteristics, namely collection is done in a structured or the level of formality is high and respondents are usually given information about the purpose of the research conducted. The aim is for the respondent to provide answers that are in accordance with the objectives of the study and not to deviate which can lead to bias in the results of the study due to the incompatibility of the data obtained. 3. Unstructured and Confidential: this method has characteristics, namely collection is carried out in an unstructured or less official manner and the respondent is not given information about the purpose of the research conducted. The difference with the first method is in the nature of formality in the process of collecting data in the field. This will have a psychological impact giving the respondent flexibility in giving answers to the questions given. 4. Unstructured and Open: this method has characteristics, namely collection is carried out in an unstructured or less formal manner but the researcher provides information openly about the purpose of his research so that respondents can clearly know the direction of the research and this will affect respondents in providing answers to each question submitted by the researcher.

c. Active Primary Data Collection Method

Active primary data collection methods include several of them a) giving questionnaires directly to respondents, b) filling out questionnaires with respondents by telephone, c) filling out questionnaires using letters, d) questionnaires using electronic mail. Giving Questionnaires Directly with Respondents: Respondents were given a questionnaire directly and asked to fill in all the questions in the questionnaire. The questions generally contain two main things, namely the first part that asks the profile of the respondent and the second part contains the main questions concerning the theme and problem being studied. In general, questions can be completed in between 30-60 minutes. Data collection techniques can be done by field data takers who meet face to face with respondents or questionnaires given to respondents and given time to fill them out. The advantage of this technique is that researchers can obtain accurate information directly from the people we will ask for information. While the weakness is that researchers will find it difficult to get in-depth and much

information because of time constraints. Filling in the Questionnaire by Phone: In principle, filling out questionnaires via telephone is the same as the first method. The main difference is that in this second technique the questionnaire must be read by the data taker by telephone to the respondent and then the respondent answers it by telephone. The weakness of this technique is the limited time and we cannot know for sure whether the person who is talking on the phone is really the person we are looking for and we want the information. Giving Questionnaires Through Mail: this technique can be defined as information seeking using a questionnaire sent to respondents by mail. The advantage of using this media letter is that researchers can ask many things, respondents have time to answer each question. The disadvantage of this technique is that it takes a long time to get back the questionnaire that has been filled, sometimes even if we get respondents who are lazy to write letters, the questionnaire will not be sent back to us. Another disadvantage is that we do not make direct contact, the answers written can be done by people we don't mean. Questionnaire in Email: the development of technology allows researchers to conduct interviews using questionnaires sent via email (electronic mail) to respondents. This technique is widely used in business research. The advantage of this technique is that researchers can reach respondents who are far away from locations or even different cities or countries. The weakness of this technique is that not everyone has an email address and a computer that is connected to the Internet network.

CHAPTER 15

PROCESSING AND ANALYSIS OF DATA

15.1 Data Processing

Data processing or also called the pre-analysis process has the following stages: 1) editing data, 2) developing variables, 3) coding data, 4) checking errors, 5) making data structures, 6) checking computer preanalysis, 7) tabulation.

Step 1 Data Editing: The editing process is a process where the researcher clarifies, reads, consistency and completes the collected data. The process of clarification involves providing an explanation of whether the collected data will create conceptual or technical problems when the researcher conducts data analysis. With this clarification it is expected that the technical or conceptual problems will not interfere with the analysis process so that it can lead to interpretation bias of the results of the analysis. Readability relates to whether the data that has been collected logically can be used as a justification for the interpretation of the results of the analysis. Consistency includes the same type of data relating to the measurement scale to be used. Completeness refers to the complete collection of data so that it can be used to answer the problems that have been formulated in the study.

Step 2 Development of Variables: What is meant by developing variables is the specification of all variables needed by the researcher included in the data that has been collected or in other words whether all necessary variables are included in the data. If not, this means that the data collected is not complete or does not include all the variables being studied.

Step 3 Encoding Data: Giving code to the data is intended to translate data into codes that are usually in the form of numbers. The aim is to be transferred into storage facilities, such as computers and subsequent analysis. With the data already changed in the form of numbers, the researcher will more easily transfer it to the computer and look for software programs that are compatible with the data to be used as a means of analysis, for example, can the data be analyzed using SPSS software?

Examples of data coding are, for example, the questions below that use "yes" and "no" answers can be coded 1 for "yes" and 2 for "no".

Question: Do you like work now? Answer: a. yes b. not

For answers that use a scale such as the question below, then the answers "strongly disagree", "disagree", "neutral", "agree" and "totally agree" can be coded 1,2,3,4 and 5 for each -one answer.

Question: What do you think about the current telephone rates? Answer: a. strongly disagree b. disagree c. neutral d. agree e. totally agree If the answer is in numeric form, for example monthly income is Rp. 3,500,000.00 or the frequency

of reading advertisements 20 times per month coding does not need to be done again because the form is numerical.

Step 4 Check Error: The researcher checks the error before entering it into the computer to see if the previous steps have been completed without serious errors.

Step 5 Creating a Data Structure: The researcher creates a data structure that includes all the data needed for analysis then transferred to the computer. Storage of data into a computer considers 1) is the data stored in a manner that is appropriate and consistent with actual use? 2) is there data that is lost / damaged and has not been calculated? 3) how to deal with lost or damaged data? and 4) has the data transfer been done in full?

Step 6 Check Computer Preanalysis: the final data structure is then prepared for computer analysis and beforehand a computer preanalysis must be carried out in order to find out the consistency and completeness of the data.

Step 7 Tabulation: Tabulation is an activity to describe the respondent's answer in a certain way. Tabulations can also be used to create descriptive statistics of the variables under study or variables that will be cross tabulated.

15.2 Choosing a Suitable Statistical Test

Using statistics as an analytical tool in quantitative research is mandatory, because statistics are accurate measuring instruments in looking at the relationships between variables studied. Even so, researchers should be careful in choosing a statistical analysis tool that matches the type of data and the purpose of the research. If the researcher has nominal and ordinal data, then the statistical test tool is non-parametric statistics. While if the data is interval and ratio, the statistical test tool is parametric statistics. To make it easier to choose which test equipment is suitable below, there is a table that contains suitable uses between data types, hypothesis forms and statistical test tools.

Some popular quantitative analysis procedure are as follows:

Correlation: What exactly is correlation? Levin, R.I & Rubin, D.S (1988:648) define "correlation analysis as the formula that can tell us how well the estimating equation actually describes the relationship" between the two variables that are correlated. Furthermore, "Pearson correlation (as one of the types of correlation) describes the strength of linear relationship between two quantitative variables." (Warner, 2008:255) Further more he said that: "the two variables are designated X (predictor) and Y (outcome). The correlation is useful for measuring the strength of a relationship between two variables (sometimes more than two variables) in certain scales, e.g. Pearson correlation data must be in interval or ratio scale; Spearman and Kendal correlation use the ordinal scale. Strong and weak relationship among the measured distance ranges from 0 to 1. In correlation there is possibility of testing two tailed hypotheses. A one tailed correlation coefficient value results in a positive value; Conversely, if value of correlation coefficient is negative; it is called no direction correlation. What is meant by coefficient

correlation? Coefficient of correlation is a statistical measurement of the covariance or the association between two variables. If the correlation coefficient is found bigger than zero (0), then there is a relationship between two variables. If the coefficient of correlation is found to be 1, then the relationship is referred to as a perfect correlation or a perfect linear relationship whose slope is positive. Otherwise. If the coefficient correlation is found to be -1, then the relationship is referred to as a perfect correlation or a perfect linear relationship whose slope is negative.

Regression: The simple linear regression is used to measure linear association between an independent variable and a dependent variable. Gujarati (2009) defined regression analysis as the study of the relationship between one variable called a variable which is described (*the explained variable*) with one or two variables that describe (*the explanatory*). The first variable is also called as a dependent variable, and the second variable is known as an independent variable. If there are more than one independent variables, then it is called as a multiple linear regression. Warner (2008:338) define simple linear regression as :”an equation that predicts raw scores on a quantitative Y variable from raw scores on an X variable”. This definition focuses on the function of linear regression, namely to make prediction of the value of the dependent variable based on the value of the independent variable. Anderson (2011) defines simple linear regression as two variables in which one variable is called as the independent variable whose function is to predict the value the other variable called as the dependent variable. Furthermore he said that the known variable(s) is called the independent variable (s) and the variable that will be predicted is called the dependent variable.

Purposes of using regression analysis are: a) make estimation of average of the dependent variable value based on the value of the independent variable, b) test the hypothesis of dependency characteristics, c) make prediction of average of the dependent variable value based on the value of the independent variable beyond the sample scope.

Path Analysis: What is path analysis? There are many definitions proposed by several experts, some of them are as follows: "Path analysis is an extension of multiple linear regression, and which allows the analysis of more complex models" (Streiner, 2005). Another definition says: "Path analysis is a technique to analyze causal relationships that occur in multiple regression when the independent variables affect the dependent variable not only directly but also indirectly". (Robert D. Retherford 1993).

The objectives of using path analysis are: a) Viewing relationships between variables based on a priori model; b) Explaining why variables correlate each

other by using a sequential temporary model; c) Drawing and testing a mathematical model using the underlying equation; d) Identifying the causal path of a particular variable affecting other variables; e) Calculating the strength of the effect of one or more exogenous variables on other endogenous variables.

CHAPTER 16

REPORT WRITING

16.1 Definition

If a study has been completed, the researcher must make a report on the results of the study in written form. The research report is a form of accountability. There are various versions of research reports depending on which institution or expert wrote them. Even so there is a red thread in the content of report writing, which consists of the following sections: Part I Introduction; Part II contains the Methodology used; section III contains the Research Results, section IV Analysis of Research Results and Section V contains Conclusions and Suggestions.

16.2 Some Report Form Models

Business Research Results Report: The business research report for example is as follows:

1. Title
2. Executive Summary (abstract)
3. Table of Contents
4. Introduction
5. Report content that includes:
 - a. Methodology
 - b. Research result
 - c. Limitations
6. Conclusions and Suggestions
7. Appendix that includes:
 - a. Data Collection Instrument
 - b. Tables
 - c. Other Suitable Supporting Materials (Cosenza, 1985: 449)

More detail matters can be explained as follows: The title identifies the subject of the research report. The Executive Summary contains a summary of the results of the report as a whole usually discussing the research findings, the methods used and the conclusions. The table of contents contains the titles and sub-headings, the main points of the entire report. Introduction contains background information needed by readers to understand the contents of the research results. In this section the purpose of the research and other additional information will guide the reader to understand the contents of the research results. The contents outline the main details of the study include 1) what methodology is used in conducting the

study, 2) the results of actual research, 3) a statement of the limitations that exist in the study. The

methodology mainly discusses the methods and procedures used in collecting and analyzing data. In this part of the methodology the researcher must describe all matters relating to the use of methods and procedures for collecting and analyzing data in detail so that the reader can see the quality of the results of the research through the ways researchers use methods and procedures in carrying out the research activities.

In the research results, the researcher must be able to clearly describe the main findings of the research presented in detail logical and easily understood by the reader for example by using the help of graphics, tables or images. In the limitation section of the research the researcher writes a statement about the limitations of the study, which usually describes explicitly that the researcher wants to get the perfect research results, but in reality these goals will never be achieved. Therefore, researchers convey the weaknesses of the results of their research to their readers so that they are aware of the weaknesses in the study. **Conclusions and Suggestions** In this section the researcher must be able to describe the rational or scientific reasons from which the conclusions were produced. The steps in drawing conclusions must be explained in detail so that the reader can know where the conclusion came from; so the researcher gives suggestions as he wrote. Furthermore, The appendix contains all the information and materials needed to complete the research, for example instruments to collect data, computer calculation tables and other materials that are suitable and used in the study.

Scientific Results Report: The report on the results of scientific research is as follows:

Chapter I Introduction

Chapter II. Literature review

Chapter III. Objectives and Benefits of Research

Chapter IV. Research Method

Chapter V. Results and Discussion

Chapter VI. Conclusions and recommendations

Bibliography

Attachment

(including research instruments, research personnel and their qualifications, etc.)

To clarify the systematics above, below will be given sufficient explanation as follows:

Chapter I Introduction: In this section it is basically an initial proposal that researchers have made in the framework of the process of proposing the problem to be investigated, therefore the introductory content is the same as the proposal. Its contents include the background of the problem, a brief literature review, the formulation of the problem, the purpose of the research and the research method that describes how the researcher will answer the problem that has been formulated in the formulation of the problem. Methods include data collection techniques, sampling techniques, processing techniques and data analysis.

Chapter II Literature Review: Literature review includes the study of theory relating to the problem being studied and discussion of the results of previous studies that are relevant to the problems being studied by researchers. The important thing in synthesizing theory must be considered as the latest source of theory taken. Due to the development of existing theories, it is better if the researcher quotes from the latest books or references.

Chapter III Objectives and Benefits of Research: Because this topic is already listed in Chapter 1, this section can be omitted.

Chapter IV Research Methods: In this section the researcher explains the method that will be used to solve the problem being investigated. First the researcher determines what approach will be used, for example quantitative or qualitative approaches. Then the methods that will be used, for example surveys for quantitative and participatory research for qualitative. Also determine the sampling technique in taking samples that will be used as information or data searches. The other thing is the data collection instrument. If the survey is chosen, then the questionnaire is used if participatory research, then the interview is used. Another important part that must be displayed is about data processing techniques and data analysis techniques. Data analysis techniques, especially those using a quantitative approach, must be adjusted to the title, problem formulation and research objectives, for example if the researcher gives a title using the word "relationship or correlation" then the statistical data analysis technique is correlational analysis. In determining the quantitative analysis tool, researchers must consider the type of data they have available whether the data is nominal, ordinal, interval or ratio

Chapter V Results and Discussion: In this section the researcher writes the results of his research and discussion. The results of the study are usually divided into two, namely: the first part of the presentation of data obtained in the field which can be in the form of frequency tabulation or in the form of narration. In the second part contains an analysis relating to the formulation of the problem and the

purpose of the study; so that all research objectives that have been formulated can be answered.

Chapter VI Conclusions and Suggestions: In this section the researcher draws conclusions relating to the results of data analysis. Conclusions must be in line with the research objectives.

CHAPTER 17

QUALITATIVE RESEARCH DEFINITION

17.1 Definition

Qualitative research is defined as a process that tries to get a better understanding of the complexities that exist in human interactions (Catherine Marshal: 1995). The above definition shows several key words in qualitative research, namely: process, understanding, complexity, interaction, and humans. The process of conducting research is an emphasis in qualitative research and therefore in conducting research, researchers focus more on the process than the final results. Denzin and Lincoln (2005) gives definition of qualitative research as a situated activity that locates the observer in the world. While Merriam BS(2009) define qualitative research: “Basically, qualitative researchers are interested in *understanding the meaning people have constructed*, that is, how people make sense of their world and the experiences they have in the world.

Because the process requires time and conditions that change, the definition of this research will have an impact on the design of research and the ways in which it is implemented which are also changing or flexible. Understanding implies *verstehen* meaning that researchers in conducting research should understand the problem from within the context of the problem under study, therefore qualitative researchers do not take distance from what is studied as a quantitative approach research that distinguishes between researchers as subjects and those who examined as an object. In qualitative research the researcher mingled into one with the one studied so that researchers can understand the problem from the point of view examined itself.

Complexity gives us an idea that the objectives under study are complex, complex and interrelated with each other as the characteristics of everyday life. The logical consequence of this condition, then in a study that uses a qualitative approach the problem must be viewed holocytically as not fragmented in fragments or parts of the problem as in quantitative research. Complex problems have the main characteristics of not standing alone and related to other problems, therefore solving the problem must be completely not done in pieces.

Interactions occur among living things, especially humans. The word interaction implies a relationship with one another so that in conducting qualitative research, a researcher should always ask whether the problem under study relates to other

problems or other conditions and does not stand alone. The main objective of qualitative research is humans because humans are the source of problems and at the same time solve problems. Even so, qualitative research does not only limit research to humans. Other targets can be events, history, objects in the form of photos, artifacts, legacies of ancient civilizations and so on. The point is the goal of qualitative research is humans with all cultures and activities.

1.7.2 When Should We Use Qualitative Research

The researcher can use a qualitative approach to research if the person concerned wants to do the following: a) Understand the meaning that underlies participant behavior; b) Describe the background and partisan interaction; c) Exploring to identify new information; d) Understand limited circumstances and want to know in depth and detail; e) Describe phenomena to create new theories. Focusing on human extraction and the processes they use.

CHAPTER 18

THE FUNDAMENTAL THEORIES

18.1 Introduction

Every method or approach is always based on thoughts or theories that are used as a basis for thinking. Without the theory of a method or approach like a building without its foundation, the method will be easily shaken. One of the main functions of theory is to provide the foundation in scientific thinking. Research using a qualitative approach is based on among them phenomenological theories and symbolic interactions.

1.8.2 Phenomenology

Phenomenology is the study of phenomena or symptoms based on Max Weber's theory (1864 - 1920). This theory emphasizes the method of appreciation or interpretive understanding (*verstehen*). If someone shows a certain behavior in society, then that behavior is the realization of the views or thoughts that are in the person's head. Reality is an expression in one's mind, therefore, the reality is subjective and interpretative.

1.8.3 Symbolic Interactions

Symbolic interaction theory is a theory that explains human behavior by using meaning analysis. In analyzing the meaning, there are three premises that form the basis for explaining a behavior carried out by someone. The first premise says that someone who does a certain act is based on the meaning that is in something. For example, someone who boarded an executive class aircraft actually wanted to get the meaning of what he was doing, namely "prestige" or "prestige" caused by the executive class. The second premise explains that the meaning of something arises if it is in the environment of human interaction. Examples of someone who is smart will be aware if other people in his social environment say he is "smart" and "smart". The third premise says that someone will hold that meaning to be used as a reference and interpreted if the person is dealing with someone else. Example: the smart person above will feel above the wind or higher when dealing with other people who are under his intelligence.

CHAPTER 19

QUALITATIVE RESEARCH DESIGN

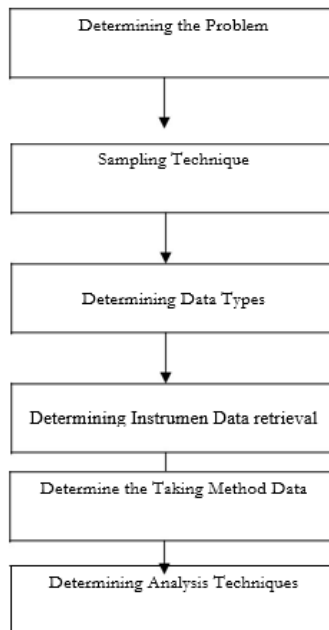
19.1 Introduction

Qualitative research designs are flexible and change according to field conditions unlike quantitative research design that is fixed, standard and does not change. Therefore the role of researchers is very dominant in determining the success of the research carried out, while the role of design only helps direct the course of the research process to fit the problem statement and run systematically.

19.2 Qualitative Research Design Models

The research design model is a qualitative approach as follows: a). Problem statement; b). Research design which includes: sampling techniques, samples, data types, data retrieval instruments, data collection methods and data analysis techniques. The design can be described as follows:

Figure 19.1 Qualitative Research Design Model



The figure above can be explained as follows:

Problem Statement: Formulate the problem to be examined according to provisions before doing other stages because the next stage in the research will be determined by the problem that has been formulated. The problem is clear and does not double so that it creates various interpretations.

Sampling Technique: The first consideration in determining the sample is that for qualitative research we use what is called a non- probability technique , namely the technique of taking samples that are not based on statistical formulations. The technique includes a) convenience b) judgment and c) snowball. The second consideration is determining the quality of respondents. Data Types : daya type is non-numeric data. Instrument for Data Collection: in depth interview. Data Collection Methods: Conduct interviews, involved observation directly, and review of documents. Analysis Techniques: consisting of domain analysis, taxonomy, complementary, cultural themes and constant comparison.

The second model is taken from Taylor SJ et.al (2016): 1. The procedures that will be used can be participant observation or open-ended interviewing. 2. Some strategies for identifying and obtaining access to settings or informants. 3. The approximate number of settings or people planned on studying, indicating that this may change once you get into your research. 4. Data collection and recording procedures. Describe the nature of the data that will be collected and the recording methods. Participant observers generally record their data as field notes; interviewers prepare transcripts based on either tape recordings or notes taken during the interviews. 5. Data analysis procedures. Specify the analytical procedures. Examine the structures of participants' interview narratives; or to map the activities of those working in a particular setting. It should be provided with a tentative plan for coding and organizing the data, including the use of any computer software programs. 6. Significance of the research. Be sure to indicate what is the expectation to accomplish and to consider that the study might contribute to the field. 7. Timelines for the completion of the research, including identification of settings or interviewees, data collection, data analysis, and the final report of the research.

19.3 Qualitative Research Proposal Model

The proposal model and qualitative research can follow the format as follows:

The scope of research: Contains an outline of the research that states why the problem needs to be investigated, what contribution will be given, what the boundaries are and shows what literature is available to inform the research

Research problems and objectives: In order for research to be directed, the researcher must formulate the problem and the purpose of the research. Problem formulation and research do not have to be what is made in quantitative research. At least the formulation and objectives of the study indicate the clear direction and purpose for which the research will be carried out.

Goals: In this section the researcher wrote down the reasons for conducting the study.

Quantitative, Qualitative and Mixed Method Research Methodology

Proposed approach: In this section the author describes an outline research approach. Shows who will be involved in this study, how much their involvement is, who will be used as informants, and the time and location of the study.

Method: in this method, the author explains how information will be obtained and collected, for example using interviews, *focus group discussion* (FGD), or triangulation. Who will be informed and how many are they and the reasons why they were

selected as informants. Is the selection of informants based on uniformity or difference, for example the informant group has information differences: for example gender, ethnicity, or age.

Information Determination: The process of determining information includes how information will be recruited, whether they must be selected or not. If selected what criteria are used, will the informants be notified in advance about the research that will be carried out or not.

Implementation of Research: In time, research will be conducted using what method: interview or focus group discussion (FGD) describe the format, procedures and methods in recording interviews or FGDs. If the researcher uses several methods, specify the reason.

Analysis: Mention how data will be analyzed: transcription, categorization, or based on themes or by using other qualitative analysis techniques. In this section a code of ethics is described which includes data security, confidentiality, and security of researchers if the identity of the researcher is published.

Cost: Mention the cost calculations required. The cost components are for example: travel, room rent, honorarium, research equipment, meals, meetings and so forth.

Feedback and Reporting: Feedback relates to whether the research findings are used as feedback material, if so, to whom will be given. Reporting contains the results of the overall research.

List of Researchers: Who are the researchers involved, mention gender, experience in researching, fields of science and expertise.

Partner: Mention, if there are partners in this study, for example *partners* in funding, experts and so on.

CHAPTER 20

INFORMANT RECRUITMENT TECHNIQUES

20.1 Introduction

Qualitative research is scientific and systematic research as well as quantitative research, although in the selection of samples it is not as strict and complex as quantitative research. In choosing a qualitative research sample using a non-probability technique, which is a sampling technique that is not based on statistical formulation but rather on the subjective consideration of the researcher based on the range and depth of the problem examined. Furthermore, qualitative research is not intended to draw conclusions from a population, but rather to study the characteristics studied, whether people or groups so that the results of the research are only for the person or group being studied. The consequence of the rationale is that the selection of samples does not depend on quantity but rather on the quality of the person to be studied which we usually refer to as informants. The small number of people who will be used to become informants in our research depends on the scope of the research problem to be conducted.

20.2 How to Select Informants

How to choose a sample as an informant can be divided into three parts as follows:

First, we look for informants to be interviewed or observed.

Second, we determine the informants to be researched or questioned according to the problems studied and Third, we stop looking for informants if the information obtained is sufficient and no new information is needed.

At the bottom, just the consideration of the authors include non-probability techniques that can also be adopted for informant search in determining the sample to be studied.

20.3 Conformity Techniques

Select analysis units in a manner deemed appropriate by the researcher. The advantage is that it can be done quickly and cheaply. The disadvantage is that it contains a number of systematic errors and can give rise to influences unknown to the researcher.

20.4 Assessment Techniques

Selecting a sample of a population based on available information, so that representation of the population can be justified. The advantage is that the last

selected units can be chosen so that they have many similarities. The disadvantage is generating diversity and estimation of the population and sample chosen.

20.5 Snowball Technique

Select units that have rare characteristics and additional units indicated by previous respondents. The advantage is only used in certain situations. The disadvantage is that the representation of rare characteristics cannot be seen in the sample that has been selected and the researcher is likely to have difficulty in finding the rare character.

CHAPTER 21

DATA TYPE

21.1 Introduction

Data in qualitative research are descriptive rather than numbers. Data can be in the form of symptoms, events and events which are then analyzed in the form of categories.

21.2 Data Types

If seen from the type, then we can distinguish qualitative data as primary data and secondary data:

- a. Primary Data: This data is in the form of text from interviews and obtained through interviews with informants who are being sampled in their research. Data can be recorded or recorded by researchers.

- b. Secondary Data: secondary data such as data that is already available and can be obtained by researchers with the means to read, see or hear. This data usually comes from primary data that has been processed by previous researchers. Included in the data category are:

Text form data: documents, announcements, letters, banners Image data: photos, animations, billboards Sound data: tape recordings The combination of text, images and sounds: movies, videos, advertisements on television etc.

Basically qualitative data can be in the form of anything including events or symptoms that do not describe the count, number or quantity.

CHAPTER 22

DATA COLLECTION INSTRUMENTS

22.1 Introduction

In general, qualitative research uses interview methods in finding data; however other methods are also used. The essence of the problem is whatever the instrument, the main goal is to get information in the form of not numbers so that many qualitative researchers use technology for data collection facilities, such as *tape recorders* , computers and even the Internet.

22.2 Types of Data Collection Instruments

In general, data collection tools can be divided into two:

- a. Interview Guide: An interview guide that has been written in accordance with the problem, then used as a means to obtain information. How to use the guide can be in the form of interviews or discussions. In the example given in the next section, the author includes an interview guide used in *focus group discussions*.

- b. Researcher it self: If not using interview guides, for example in conducting direct observation, participatory research, or document *review* , the role of the researcher itself is a means or tool to obtain information. If the search for information is done in a closed or confidential manner, the role of the researcher is very important to be able to obtain information that is correct and in accordance with what is being studied. With Armed with memories, notes, cameras or videos, a qualitative researcher will try to get as much information as possible about the things he is learning. A simple example is in the world of intelligence, a police officer or secret agent who is in the midst of the community searches or intercepts the information he is looking for without being noticed by the surrounding community.

22.4 When do we use an FGD or interview (In depth Interview)

Following are the considerations when we will use FGDs or interviews.

No.	Factor that is considered	FGD is used, if	The interview is used, if
1.	Group Interaction	Interaction of informants can push that response many, new and give away Thoughts new .	Interaction of informants limited, formal and not productive
2.	Pressure Group	Pressure group useful for challenge thinking informants and give way come out for opinions different.	Pressure group will block response and obscure meaning research results .
3.	Sensitivity of objects researched	The object discussed in research not too so sensitive the the informant will give a response Fiery	The object discussed sensitive so the informants unwilling or reluctant open talk inside a Group

No.	Factor that is considered	FGD is used, if	The interview is used, If
4.	In response each individual	The topic is such so that part of it big informant say agree or can know only in time short .	Topic requires that response depth of each each informant because of Complexity the problem so required informant the informant good knowledge .
5.	Data Finder	Only one is needed people for collecting data	Requires a lot interviewer for Collect data / informant .
6.	Problem Outreach Covered	The problem volume must be covered no Many	Volume big problem
7.	Sustainability Information	One problem area studied in depth	Requires for understand existence the relationship between attitudes and behavior based on Each Individual
8.	Observation by ordering research (<i>Stakeholders</i>)	Order results research should be also see and listen to what what was said by inside informants Discussion	Order results research is not necessary find out the informant from the first source were interviewed.

CHAPTER 23

DATA COLLECTION METHOD

23.1 Definition

What is meant by qualitative data is data in the form of not numbers. Data can be in the form of text, documents, images, photos, artifacts or other objects found in the field while conducting research using a qualitative approach.

23.2 Data Collection Method

The main methods include:

1. Participation

Participation is one of the main ways to find data or information in qualitative research methods. The way to do data collection is through direct involvement with the object under study. If the object is a community or group of individuals, the researcher must blend with the one being studied (*immersion*) so that the researcher can hear, see and feel the experiences experienced by the object being studied. Because this technique requires deep recognition, then the time needed to get data or information becomes long. The longer the researcher mingles with the one being studied, the researcher will be able to study the patterns and life behaviors of the object under study.

2. Observations

Observation activities include recording systematically the events, behaviors, objects seen and other things needed to support the research being carried out. In the early stages of observation in general, researchers collect as much data or information as possible. The next stage the researcher must make focused observations, which are starting to narrow down the data or information needed so that researchers can find patterns of behavior and relationships that continue to occur. If it has been found, the researcher can find the themes to be studied.

One of the main roles in making observations is to find complex interactions with natural social backgrounds.

3. In-depth Interview

Mechanical interviews in qualitative research approach was divided into three categories, namely 1) the interview by way of informal talks (*informal conversational interview*), 2) general-directed interviews (*general interview guide approach*), and 3) open standard interview (*standardized open-ended interview*). (Patton, 1990: 280-290 cited by Catherine Marshal, 1995: p. 80).

In using this interview technique, the success in getting data or information from the object under study is very dependent on the ability of researchers to conduct interviews.

The way to conduct an interview is similar to if we are having a conversation with our interlocutor. The interview begins by presenting general

topics to help researchers understand the perspective of the meaning of the interviewee. This is in accordance with the basic assumptions of qualitative research, that the answers given must be able to reveal the researched perspective rather than the opposite, namely perceptive from the researchers themselves.

The main advantage of interviewing is that it allows the researcher to get a large amount of data, on the contrary the weakness is because the interview involves emotional aspects, so good collaboration between interviewers and interviewees is needed. From the interviewer's side, the person concerned must be able to make questions that do not give rise to long and long-winded answers so that the answers become unfocused. On the other hand, from the interviewee's side, the person concerned can reluctantly answer openly and honestly what the interviewer asks or even he is not aware of the repetitive patterns of life he experiences everyday.

What is needed by the interviewer so that the interview process is successful is the willingness to listen patiently, be able to interact with others well, be able to package questions well, and be able to subtly collaborate what is being asked if it is felt that the interviewee has not provided the information he expected.

4. Document Review

Studies document is an aid researchers in collecting data or information by reading the letters, announcements, meeting summaries, a written statement of certain policies and other writing materials. This data search method is very useful because it can be done without disturbing the object or atmosphere of the study. Researchers by studying these documents can recognize the culture and values embraced by the object under study.

The use of this document is related to what is called content analysis. The way to analyze the contents of a document is by systematically examining documents in forms of communication that are written in the form of documents objectively.

5. Elite Interviewing

What is meant by special interviews is conducting interviews with certain elite groups, for example with leaders certain company or office. The main purpose is to obtain information relating to important policies of a company. This elite group really understands the ins and outs of the company from various sides, for example in terms of the quality of human resources, finance, and policies relating to company goals. Such information will not be obtained from ordinary employees or middle group managers.

6. Focus Group Interviewing

Interviewing this model was inspired by marketing researchers. They conduct *interviews* or discussions with several people who usually consist of 5-10 people.

The group is the implementation is guided by an expert in the field of marketing and lead discussions by way of giving the questions that have been designed previously. Questions were given to participants and then the participants were asked to answer and discuss with the group.

The purpose of the discussion of this model is to filter out common problems to be more specific which in the end these specific problems will be used as problems that deserve to be studied.

Complementary Method: Complementary methods can be used simultaneously with the main method above to obtain data as desired by the researcher. Some complementary methods that will be discussed are:

a. Narratives

Narrative is a method taken from the fields of literature and psychology. The researcher in collecting data explores the story of the person being studied. To implement this method, researchers need to develop working relationships equally good with the investigation.

The advantage of this method is that researchers can reveal as much information as possible from the source under study. The weakness of this method is takes a long time to listen to the story of the object under study and the answers given are not systematic, because the person might tell the story according to what he has in mind.

b. Life History

Studying life history is another technique in qualitative research. The life history of a person or institution is accurate data if we are conducting research related to the historical fact of an event where people whose life history we learn are involved either directly or indirectly with the events we are examining.

Data in life history is secondary data that is easily available where researchers just need to read and study it.

c. Historical Analysis

If life history is used as a means for collecting secondary data about one's life, then historical analysis is secondary data whose scope is wider than the history of life where historical analysis is related to a general event, for example the history of the Republic of Indonesia, history of computer inventors, history the discovery of the Internet and others.

d. Movies, Videos and Photos

Films, videos and photos are secondary data sources that are useful for researchers because they can be images and sounds that will complement textual data. In qualitative research data in the form of sounds and images are useful for proofs in law, police and intelligence.

22.3 Online Secondary Data Collection Methods

1. Introduction

Current information technology allows researchers to search data and / or information by using the Internet as a medium for fast and easy data collection tools. With the availability of sophisticated search tools, *servers* that store data and / or information spread across various parts of the world and the emergence of *online* information buying and selling businesses will make it easier for researchers to conduct research *online* .

This paper discusses the strategy of collecting secondary data *online* which includes the first definition of understanding, the two search techniques, the third evaluation of the quality and validity of search results, and the four types of search tools.

2. Definition

In this paper what is meant by secondary data is data and / or information that is not obtained directly from the first source (*respondent*) through either obtained through interviews or using a written questionnaire. Data and / or information can be quantitative and qualitative. Quantitative type data is data relating to numbers, for example financial statements, statistical data on a particular topic, data that states the amount, weight, distance and so forth. Qualitative data can be text, images, and sounds. Search *online* is a search by using a computer that is done through the Internet with certain search tools on servers that are connected to the Internet that are spread across various parts of the world.

3. Search Techniques

How to search secondary data *online* can be done by means of computers that are connected to the Internet using certain methods. The search method can be a simple method or sophisticated methods according to facilities provided by certain search tools. In this paper, the author will provide an example of online search using Google's search tool (<http://www.google.com>) on the grounds that Google provides the most advanced *search tool* (*Intelligent Search Tool*) that can search more than 3 billion pages pages on the *World Wide Web* .

4. Evaluation of Information Quality

Due to the absence of censorship on the Internet, we need to evaluate the quality of the writing / references available on the Internet, including the Author's Name, Title or Position, Organizational Affiliation, Date of writing, and Contact Address. The following are discussed ways to measure the quality of writing on the Internet based on the level of credibility of the author and the contents of his writing:

a. **Reliability**

the reference sought should be considered reliability, especially from the side of the author. If the author is indeed an expert in his field, then the writing can be trusted in its quality. At the back of the book, it is usually written a brief history of the author, for example the experience of writing a book, his studies, and his career path. From this information we can assess how much reliability the book is currently written in relation to the field of knowledge and experience in writing a book.

b. **Use the CARS (*Credibility Accuracy Reasonableness and Support*) checklist method (Robert Harris, 1997) to test the quality of information originating from the Internet.**

First, credibility involves clear and accountable sources of information that enable us to believe it, the clarity of the author's background regarding education, address, experience, position and judgment of fellow writers, quality control from fellow writers, clear references taken from journal or other research results.

Second, accuracy includes not *up-to-date* , factual, detailed, definite, comprehensive, reader-oriented and purpose-oriented, making the current source not outdated information, and can provide a full picture of the truth.

Third, it can be accepted with common sense which includes fairness and impartiality, provides balance, is objective, does not give rise to conflicts of interest, is not inciting, has a purpose to be used as a source that can be trusted because it raises the whole truth.

Fourth, the existence of support such as reference sources on theory, data or numbers taken from other sources outside the author's book, contact information so as not to give the impression that the real author is unknown, allows service demands, the purpose of which is to provide convincing evidence to the the reader if the reader makes a claim or if the reader wants to ask questions related to what the author has written.

5. **Types of Search Tools**

In the World Wide Web technology, there are three types of search engines (*search tools*), namely 1) Meta Search Site, 2) Search Engine, and 3) Subject Guides and Directories.

6. **Meta Search Sites**

Meta search sites which are a collection of several search tools are good search tools, especially for complex research searches because these sites allow users to speed up searches by reducing search time if done by search tools from other sites. . The principle of *meta* search is searches carried out on several *search engines* in a single search. The advantage of this tool is that we can save time and avoid

duplication. The disadvantage of this tool is the loss of search options that distinguish between one search tool and another.

7. Search Engine

Search Engines have very specific search characteristics that depend on each site that provides them. The general similarity is that they use the Boolean method in their search. For a focused and successful search, researchers should study the characteristics of each search engine below:

- AltaVista: <http://www.altavista.com>: The main feature of AltaVista that can index more than 550 million pages of sites is the use of analysis of the relevance of the text as well as the use of Boolean logic. Search can be done by using the right word or phrase in accordance with the topic being sought. The search can be limited to certain parts, such as the title, the anchor (*anchor*), *hosted* , *links* , applets, images, and URLs. Alta's main advantage Vista is the ability to combine searches with just one search.
- Northern Light: <http://www.northernlight.com>: Northern Light has the main characteristics, which can cut and display plural forms automatically Northern Light uses Boolean logic in full and can limit searches, for example only titles or URLs.
- HotBot: <http://www.hotbot.com>: The main feature of HotBot is that it is the best part of the *web* and other *web* documents . Search is done using Boolean logic but we cannot search for these facilities with just one search.
- Google: <http://www.google.com>: Google is known as the smartest search tool. Even though we only simply search by entering words or just a few words, Google will automatically do a search with Boolean logic by using the boundaries of *AND*, *NOT*, *PHRASE* , and *OR* . Google does not support *truncation* , addition and does not distinguish between upper and lower *case* letters (*case sensitive*). Another advantage is that Google uses relevance and *linking* , which is a certain number of similar pages related to the page sought. Google even allows us to search using certain symbols, for example for *stock quotes* , maps, and provides a choice of 60 languages. Google also provides files with PDF extensions that are rarely produced by other search tools.
- Fast Search: <http://www.alltheweb.com>: Search methods on this web use

Boolean logic. We can limit search only to titles, texts, link names , URLs, links, languages and domains. Search ranking is based on relevance, *link* analysis , text placement on certain pages, and use of keywords.

- Excite: <http://www.excite.com>: Excite search engine *reviews* the information content of web pages, uses *meta-tags*
- anchor , and link popularity to determine the relevance and ranking of search results.
- Lycos: <http://www.lycos.com>: Lycos doesn't currently have its own search engine. This *web* relies on searches that come from *Fast* and *Inktomi*.

8. Subject Guides and Directories

The third type of search tool is in the form of *Subject Guides* and *Directories* . The main characteristic of this search tool is that information is organized by categories of subjects or topics, for example the categories of education, business, computers and so on. Making this category makes it easier for people to search more specifically.

- Yahoo !: <http://www.yahoo.com>: Yahoo does not use robots in creating information directories, this *web* depends on the number of *webs sites* that are registered in their directory. Even so, Yahoo is very selective in accepting sites that are registered. Because Yahoo does not have a wide range, this *website* provides Google's search engine as a complement.
- LookSmart: <http://www.looksmart.com>: *LookSmart* processes the *index* into around 200,000 categories arranged hierarchically. Categories include everything from plantations and car books and competitions to space issues. Search techniques in this *web* use keywords or track through each category.
- About.com: <http://www.About.com>: This *web* search method is similar to *LookSmart* . The location of the difference is in *About* there are geographical sites of the countries of Australia, Canada, India, Ireland, England and Japan.
- Open Directory Project: <http://www.dmoz.org>: The *Open Directory Project* is similar to Yahoo, which is doing an index process using humans. Subject categories are arranged by hierarchy. Fill in categories similar to Yahoo with additions regarding *World* subjects using German, Spanish, French, Japanese, Chinese, Italian, Portuguese, Russian, Polish, and

Indonesian WWW Virtual Library:

- Data Sources by Subject. <http://vlib.org/Overview.html>: This directory is composed by experts in their respective fields. This site uses a search method based on simple techniques, namely by *browsing* based on categories, alphabetical order, and keywords. Because it is done by humans, the topics in this directory are often out of date.

CHAPTER 24

ANALYSIS TECHNIQUES

2.4.1 Definition

Qualitative analysis is an analysis that is based on the existence of semantic relationships between the variables being studied. The aim is that researchers get the meaning of the relationship of variables so that they can be used to answer the problems formulated in the study. The relationship between semantics is very important because in qualitative analysis, researchers do not use numbers as in quantitative analysis.

The main principle of qualitative analysis techniques is processing and analyzing collected data into systematic, regular, structured and meaningful data. The qualitative data analysis procedure is divided into five steps, namely: 1) organizing data: This method is done by repeatedly reading existing data so that researchers can find data that is in accordance with their research and discard inappropriate data, 2) create categories, determine themes, and pattern: the second step is to determine the category which is a fairly complicated process because the researcher must be able to group existing data into a category with their respective themes so that the pattern of regularity of the data becomes clearly visible; 3) test hypotheses that arise by using existing data: after the process of making a category, the researcher tests the possibility of developing a hypothesis and tests it using available data, 4) looking for alternative explanations of data: the next process is that researchers provide information that makes sense of existing data and researchers must be able to explain the data based on the relationship of the logic of the meaning contained in the data, and 5) writing reports: report writing is an integral part of qualitative analysis. In this report the researcher must be able to write words, phrases and sentences as well as precise understanding that can be used to describe the data and the results of the analysis.

2.4.2 Qualitative Analysis Model

Narrative analysis is used to conduct an interview to the informants by asking them to tell stories about their daily life. The main thing to discuss is the recognition of telling about the informants themselves or to other people. The main focus of the narrative analysis is not to find the absolute truth but the reality undergone by the informants.

Bogdan and Biklen (2007) as quoted by Merriam BS (2009) 1) narrow the study; 2) make decisions relating the type of the research to accomplish. 3) develop analytic questions; 4) plan data collection sessions according to previous observation that has been conducted; 5) write some comments as the research goes; 6) write down what the researcher learn during the ongoing research; 7) try out ideas and themes on participants of the research; 8) start exploring the literature while the researcher in the field doing the research; 9) use metaphors, analogies, and concepts; 10. employ visual devices as well.

Another model for analyzing qualitative data is to use: 1) Domain Analysis, 2) Taxonomic Analysis, 3) Componential Analysis, 4) Analysis of Cultural Themes and 5) Constant Comparative Analysis. (Sanapiah: 1990). In applying the analytical techniques below, the author uses examples of the fields of science in Visual Communication Design.

Domain Analysis

Domain analysis is useful for finding and obtaining a general picture or understanding that is comprehensive. The expected results are understanding at the surface level regarding certain domains or conceptual categories.

- a. **Example : Domains in the world of art include: painting, dance, carving, visual communication design.**
- b. **How to Analyze: how to analyze a domain is to use semantic analysis that is universal. Below is an example of a universal domain:**

Semantic relationship	Form	Example
1. Type	X is type Y	Advertising is one type of promotion
2. Room	X is the place at Y or part of Y	The drawing room is part of the laboratory
3. Cause and effect	X is the result of Y	Bad advertising design wrong color composition

Semantic relationship	Form	Example
4. Reason	X is the reason do Y	The ad is good, so consumers buy products advertised
5. Location for do	X is a place do Y	The drawing room is place to draw
6 Ways to Go	X is the way do / reach Y	Make a good logo to reach the image good company
7. Sequence / stage	X is a sequence or stage in Y	Coloring is one stage in make a logo
8. Function	X is used for Y	Font used to attract readers
9. Characteristic	X is characteristics of Y	Color composition is a logo attribute

c. Applications in Ad Design: below are examples of domain analysis applications in ad design using structural questions

Semantic relationship	Form	Example
1. Type	X is type Y	What are the types of advertisements is there ?
2. Room	X is the place at Y or part of Y	What are the parts the whole of a advertisement ?
3. Cause and effect	X is the result of Y	What causes the color of the ad not suitable?
4. Reason	X is the reason do Y	What are the reasons make ads with color black and white?
5. Location for do	X is a place do Y	Anywhere the advertisement aired / installed?

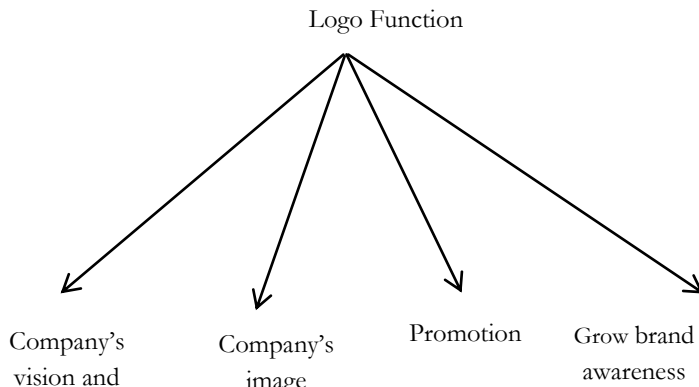
6. Ways to Go	X is the way do / reach Y	What are the ways to achieve the form of design communicative advertising ?
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Semantic relationship	Form	Example
7. Sequence / stage	X is a sequence or stage in Y	What are the stages overall inside make ad design?
8. Function	X is used for Y	What are the functions of advertising is that ?
9. Characteristic	X is characteristics of Y	What are the characteristics the whole ad interesting ?

Taxonomic Analysis

Taxonomic analysis is based on a focus on one domain (domain internal structure) and collecting things / elements are the same .

Logo Taxonomy: the taxonomy of logo functions can be described below:



Componential Analysis

Compound analysis emphasizes the contrast between elements in a domain, only different characteristics are sought.

Example: Look for different characteristics in a company's Logo Function with contrast dimensions as below:

Category Character Logo	Not Standard	Semi Standard	Standard
Form			
Color			
Size			
Writing			
Visibility / Duration			

Analysis of Cultural Themes

The way to analyze cultural themes is to look for the common thread that is associated with values, value orientation, basic / primary values, premise, ethos, worldview and cognitive orientation. The analysis stems from the view that everything we examine is basically a whole (whole), not fragmented; therefore researchers in analyzing the data should use a whole (holistic approach) The analysis technique is that researchers do things like this: Dissolve / unite themselves as optimal as possible while conducting research to appreciate what is being studied.

Perform cross domain componential analysis Identify domains that include dominant information compared to other domains. Make a schematic diagram that shows the relevance of all domains Look for similarities between contrasting dimensions to bring up the themes of the symptoms being studied. Look for universal themes that are usually loaded on a number of existing theories. Make a summary of all existing data / information to not only see the facts, but also intertwine them with one another. Make a comparison to track similarities and differences so that other alternative themes can emerge.

Constant Comparative Analysis (Grounded Theory Research)

The way to do a constant comparison analysis is as follows:

1. Collect data to compile / find a new theory.
2. Concentrate on detailed descriptions of the nature or characteristics of the data collected to produce general theoretical statements.
3. Make a hypothesis about the relationship between the symptoms, then test it with another part of the data.
4. Based on the accumulated data that has been hypothesized, researchers develop a new theory.

The types of activities are as follows: Writing a note: write the basic things, and then describe or specify in more detail by way of giving a full description, eg the context of events, chronology and causality, revealing factual data and research assessment. Starting from data to concept: Modifying the concept by way of making specific things into abstract.

Conducting a wavy analysis, from the narrow to the broader The development of themes inherently becomes a theory.

CHAPTER 25

VALIDITY OF QUALITATIVE RESEARCH

25.1 Introduction

One weakness in qualitative research that is often questioned by quantitative groups of researchers is the validity of the results of qualitative research. How can the results of qualitative research obtain high validity, as the results of quantitative research that can be measured by numbers? Perhaps the answer to that is difficult to obtain; however, qualitative research can still obtain validity if done correctly, carefully and by using systematic procedures.

25.2 Ways to Improve the Validity of Qualitative Research

Based on empirical experience, qualitative researchers try to form ways to improve the validity of qualitative research by doing the following things:

- a. Expanding the initial expectations: Learn the personal notes made from the beginning of the study so that the idea of how the data has been collected encourages us to create initial assumptions. In other words, where did the initial assumptions that have been formulated come from? Have there been adjustments between the assumptions made and the data that has been collected.
- b. Focusing on how to look at other data sources: researchers should use triangulation and comparison techniques with other literature more extensively.
- c. Make extensive quotes from field notes and interview results , as well as *archive* data and video / audio recordings.
- d. Use other research data as a source of checking: and involve many researchers in reviewing the problem being studied or by using other verification sources.
- e. Conduct checks by asking researchers to examine the results of our research (*peer researchers*) by conducting *reviews* starting from problems, data, analysis techniques and results.

25.3 Increases Reliability

So that qualitative researchers have reliability, researchers should do the following things:

- a. Study video recordings done several times by different or similar people
- b. Listen for several times audio recordings by different or the same person
- c. Study the transcription of repeated recordings done by the same or different people.

In this way researchers are expected to be able to find the most important things that are sought. Even so according to its nature, namely reality is dynamic so it is difficult to get things that are consistent. Qualitative research characteristics that study the reality of life as a whole are still difficult to capture reality perfectly and indeed reality cannot be photographed in its entirety.

CHAPTER 26

PRESENT QUALITATIVE RESEARCH RESULTS

26.1 Introduction

Qualitative research results in the form of recordings in the form of video or audio which are then transcribed in text form. It is different from the results of quantitative research in the form of numbers so that it is easily tabulated and presented in the form of a tabulation or cross tabulation model. Presenting research results in the form of texts is not easy, because presentations must be systematic, logical, and based on certain criteria, such as categories, themes, or comparisons. Below is shown an example of the presentation of research results in the form of a *matrix* based on categories and themes. The first study on the perception and assessment of the activities in the sharing of knowledge (*Knowledge Sharing*) among the academic community on campus "X". Second research about the need for information technology and telecommunications services among senior high schools in Bandung.

26.2 Perception and assessment of activities in various knowledge among the academic community on campus X

Problem: This study revealed when knowledge sharing activities were carried out by informants.

Table 26.1 Interview Results are displayed in the form of a Matrix

Group researched	(a) Activities	(b) Which one is most effective	(c) Why / Reason
The informant Examined	In the seminar Official Via <i>email</i> Exchange information informant Eating meeting Noon	In official seminar Send <i>E-mail</i>	The most way suitable for communicating the information a lot .
Group comparison / p control	In the seminar Official Exchange Information Informal At meal time afternoon together	Exchange information in a manner informal Official seminar	More ways easy to spread inside information background / condition not official Information that spread more a little
Leaders Institution	In the seminar Official At meal time afternoon together	Official seminar	Many visited by the guests or non- participation

Example 2: Study of the needs of senior high school Information and telecommunications technology services in Bandung

Problem: What school activities can be served with IT and TK.

Table 26.2 *Activities that can be supported by Information Technology and Telecommunications Technology*

Activities that can be supported with Information Technology	Supportable Activities with Telecommunications Technology
<p>1. Needs as a means of communication between students, teachers and parents fast and cheap compared to currently available</p>	<p>1. Needs as a means communication between students, teachers and parents are fast and cheap compared to existing ones at this time .</p>
<p>2. Needs as a means for communicate school activities curricular nature such as:</p> <ol style="list-style-type: none"> a. Announcement of schools that are support the teaching and learning process, like giving assignments to students b. Announcement of problems with test results or exam c. All school subjects except Arabic and though subjects Body d. Publish test questions and the answer e. Re-registration activity / Registration f. Information about repayment of SPP g. Information about books new collection h. Profile and expertise of teaching staff i. Registration of new students (PSB) Writing of teachers and students Stufnrt's assessmenr of the quality of teaching teacher <ol style="list-style-type: none"> 2. Communicate ectra-curricular activities, such as <ol style="list-style-type: none"> a. Announcement of sports activities b. Announcement of art activities c. Announcement of religious activities d. Announcement of computer skills 	<p>2. Curricular activities, in particular as follows: a) Announcement support the learning process teach; b) registration; c) information about repayment SPP; and d) information regarding new student registration</p>

e. Announcement of incidental activities, such as performing arts, exhibitions etc.	
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Activities that can be supported with Information Technology	Supportable Activities with Telecommunications Technology
<p>2. Needs as a means of promoting school profiles to the community through the internet</p> <ul style="list-style-type: none"> a. Simplify and speed up registration administration process new student b. Increase added value for school against competitors and candidates students who will enter into the school . 	
<p>5. The need to improve quality faster, more efficient school services effective and global scale (no limited geographical factors) and cheap</p>	

CHAPTER 27

WRITE A REPORT

27.1 Introduction

Each research result should be written in the form of a written report, this is in accordance with the applicable conventions and to avoid clarity for the readers of the results of the research. There are so many formats for reporting the results of research even though the most important is not systematic, which sometimes changes and differs from one another. The essence of the report can be written as follows:

- Part I: Introduction
- Part II: Literature Review
- Part III: Research Methodology
- Part IV: Research Results
- Part V: Analysis of Research Results
- Part VI: Conclusions and Suggestions

Introduction

The introductory chapter contains the background of the problem, the formulation of the problem, the purpose of the research, the benefits of the research, the design of the research to be used, and the limitations of the problem to be examined. assessment team.

Literature Review

In this section contains a study of supporting literature relating to concepts, theories, data or findings from previous research results relating to the problems studied and underlying the research being carried out.

Research Methodology

This section contains the approaches, methods, and techniques used to answer predetermined goals. Methods include determining the population, samples, data collection *instruments* , analysis techniques and measuring instruments.

Research Results

The results of the study contain descriptive explanations of all data and information obtained in the field. The amount of exposure depends on the number of questions given to the informants studied.

Analysis of Research Results

In this section, the researcher analyzes the results of the study by using analytical techniques that are appropriate to the problems studied. The description of the results of the research and analysis should be in line.

Conclusions and Suggestions

In the conclusions section contains the answers in accordance with the research objectives in the introduction. Keep in mind there must be a red thread between the formulation of the problem, the purpose of the research and conclusions. The suggestion section contains the recommendations of the researcher regarding the results of the research which are summarized in the conclusions. Therefore, it is best to give advice always based on conclusions that have been made.

Chapter 28

Combining Quantitative and Qualitative Approaches

28.1 Differences Between Research Quantitative and Qualitative Approaches

The need for correct understanding in using approaches, methods or techniques for conducting research is important so that results can be achieved that are accurate and in accordance with the research objectives that have been predetermined. Which approach should be used in research between qualitative and quantitative approaches? In this chapter we will give a brief review of the basic understanding of the two approaches.

Concept related to approach: The qualitative approach emphasizes meaning, reasoning, the definition of a particular situation (in certain contexts), more researching things related to daily life. The qualitative approach, furthermore, is concerned with the process compared to the final result; therefore the sequence of activities can vary depending on the conditions and the number of symptoms found. The purpose of research is usually related to practical matters. The quantitative approach emphasizes the existence of variables as the object of research and these variables must be defined in the form of operationalizing each variable. Reliability and validity are absolute requirements that must be fulfilled in using this approach because both of these elements will determine the quality of the research results and the ability to replicate and generalize the use of similar research models. Furthermore, quantitative research requires the existence of hypotheses and testing which will then determine the next stages, such as determining the analysis technique and the statistical formula that will be used. Also, this approach gives more meaning in relation to the interpretation of statistics rather than its linguistic and cultural meaning.

Basic Theory: If we use a qualitative approach, then the basis of theory as a basis is the existence of symbolic interactions of a symptom with other symptoms interpreted based on the culture concerned in a way to find the universal semantic meaning of the symptoms being studied. In the beginning qualitative theories emerged from anthropological, ethnological, and phenomenological studies and ideals. Because these theories are general and open, other social sciences adopt them as a means of research. As with the quantitative approach, this approach rests on what is called structural functionalism, realism, positivism, behaviorism and empiricism which essentially emphasizes concrete things, empirical tests and tangible facts.

Purpose: The main purpose of research that uses a qualitative approach is to develop understanding, concepts, which eventually become theories, this stage is known as "*grounded theory research*". On the other hand, the quantitative approach

aims to test theory, build facts, show relationships between variables, provide statistical descriptions, estimate and predict results.

Design : Seeing its nature, the qualitative design approach is general, and changes / develops according to the situation in the field. In conclusion, the design is only used as an assumption to conduct research, therefore the design must be flexible and open. As with research design that uses quantitative approaches, the design must be structured, standardized, formal and designed as well as possible beforehand. The design is specific and detailed because the design is a research design that will actually be carried out. Therefore, if the design is wrong, the results will be misleading. Examples of quantitative design: *ex post facto* and experimental design that includes them *one short case study*, *one group pretest, posttest*, *Solomon four group design* and so forth.

Data: In a qualitative approach, the data is descriptive, meaning that data can be in the form of symptoms categorized or in other forms, such as photos, documents, artifacts and field notes at the time the research was conducted. On the other hand, research that uses quantitative data approaches is quantitative / statistical numbers or quantifiable codes. The data are in the form of variables and their operations with a certain size scale, for example nominal, ordinal, interval and ratio.

Samples: Small samples are characteristic of a qualitative approach because the qualitative approach emphasizes the selection of samples based on their quality rather than the amount. Therefore, the accuracy in choosing a sample is one of the main keys to success in producing good research. Samples are also viewed as theoretical and unrepresentative ones. Whereas in the quantitative approach, the number of samples is large, because the statistical rule says that the larger the sample will increasingly represent the real conditions. Because generally a quantitative approach requires a large sample, then the stratification of the sample is needed. Samples are usually selected randomly. In conducting research, a control group is needed to compare the samples being studied. Another characteristic is determining the type of variable to be examined, for example, determining which variable is determined as an independent variable, dependent variable, moderate variable, intermediate variable, and control variable. This is done so that researchers can control the confounding variables.

Techniques: If the researcher uses a qualitative approach, then the person involved will use direct observation techniques or participatory research, such as those carried out by researchers in anthropology and ethnology so that researchers are directly involved or mingle with those studied. In practice, the researchers will conduct *a review* of various documents, photographs and artefacts. *The interview* used is an open, structured or unstructured and structured or unstructured *interview*. If a quantitative approach is used, the techniques used will be structured observations, surveys using questionnaires, experiments and quasi-experiments. In searching for data, researchers usually use written or read out questionnaires. Engineering refers

to the purpose of the research and the type of data needed whether it is primary or secondary data.

Relations with those studied: In research that uses a qualitative approach, researchers do not take distance from the one being studied. Relations that are built are based on mutual trust. In practice, researchers make connections with intensively studied ones. If sample it's a human being, then the respondent is treated as a *partner*, not an object of research. In research that uses a quantitative approach the researcher takes distance from the one studied. This relationship is like the relationship between subject and object. This is done to get a high level of objectivity. In general, the research is short-term.

Data Analysis: Analysis of the data in qualitative research is inductive and sustainable in that the goal ultimately produces insights, concepts and the construction of a new theory, examples of qualitative analysis models are domain analysis, taxonomic analysis, compound analysis, cultural theme analysis, and constant comparative analysis (*grounded theory research*). Analysis in quantitative research is deductive, empirical test theory is used and carried out after completion of complete data collection using statistical tools, such as correlation, t test, variance and covariant analysis, factor analysis, linear regression etc.

Conclusion: Both approaches each have advantages and disadvantages. The qualitative approach takes a lot of time, its reliability is questionable, the procedure is not standard , the design is not structured and cannot be used for large-scale research and in the end the research results can be contaminated with the subjectivity of the researcher. The quantitative approach raises difficulties in controlling other variables that can influence the research process either directly or indirectly. To create high validity, accuracy is also needed in the process of determining samples, retrieving data and determining analytical tools.

28.2 Strategies for Combining Quantitative Approaches with Qualitative Approaches

Based on the discussion above, there seems to be no way to combine these two contradictory approaches . For followers of a pure methodology, they still hold firm in using just one approach. Even so, there are many people who are trying to find a common ground to integrate the two approaches . The author suggests that in combining the two different approaches it should be distinguished in three levels, namely the level of philosophy, theoretical and practical.

First we will talk from the level of the underlying philosophy. On one side of the philosophy foundation the quantitative approach says that reality is single, concrete, observable, on the contrary, the foundation of the philosophy of the qualitative approach states that reality is dual, round or intact, and that reality is the result of a definition and construction. Seeing these conditions we will experience difficulties when trying to combine the two approaches at the level of each

philosophy because the starting point of philosophy that underlies both approaches is different.

Second, on the theoretical level, the quantitative approach is based on the theory of positivism, empiricism, behaviorism, rationalism, and functionalism. The common thread of these theories is how way get the truth in science empirically by using the human senses and tracking from an outside perspective. Meanwhile the qualitative approach is based on theories, such as idealism, phenomenology, symbolic interaction, and naturalism. The essence of these theories states that the essence of meaning or truth can be obtained through human interaction; therefore, meaning is bound to certain human cultures and is not value free. As a result, in tracing the truth, researchers must look from the side in humans. In conclusion, at the theoretical level, we also experience difficulties in combining the two approaches because they are based on different philosophical foundations.

Third, on a practical level, at this level methods and techniques for each approach are expected to be combined or at least used simultaneously in a particular study. From empirical experience in the field, many methodologists have used combined methods to solve various problems in science. The discussion for this third problem will be discussed in depth in the following section.

Mixed Design Research Models

Combined Method: Applications in Brymman's Visual Communication Design (Brennan : 1992) propose the following model:

1. Qualitative research is used to facilitate quantitative research.
2. Quantitative research is used to facilitate qualitative research
3. Both approaches are given the same weight
4. Triangulation

In his gut, Brymman gave no examples at all. Therefore to make it easier for readers to understand this problem the author will provide examples in visual communication design research.

Model I Qualitative Research Used to Facilitate Qualitative Research

For this first model the author suggests the following: In the first stage of the research, we conducted a qualitative study using the *focus group discussion* (fgd) method. FGD is one of the popular techniques in a qualitative approach that serves as a means of gathering initial information from the informants interviewed. This FGD technique will be effective if the interaction between the participants of

the discussion in this case the informants and provide many and quality answers and provide new thoughts related to the problem being explored. To do this we need at least five discussion participants who will used as informants to extract information. The course of the discussion is led by a writer who asks questions and directs the course of the discussion. For the record, the author must not direct the answers of the informants but only provide stimulation or inducement. From the results of this discussion it is expected that clear and specific problems arise after going through screening in discussions; then the problem can be used as a problem in quantitative research.

Research using this model in visual communication design can be done by using the following topics: Study of the role of a *public figure*. In the initial stage researchers can conduct the study by conducting qualitative research with the FGD method to examine what is obtained from the results of the study related to the role of characters in the advertisement. Problems that will arise include:

- Is the presence of these artists able to play a role in increasing people's buying interest?
- Is the presence of the artist the ad itself attractive to viewers?
- Are the characteristics and daily lives of the artist can improve or otherwise worsen the company's image?
- Is the presence of the artist the message that will be conveyed by the company can be caught by their prospective customers?

From the results of the qualitative discussion, for example, the last problem emerged which was the most dominant in the conversation; then the problem that will be examined is "The effectiveness of the role of the artist X in delivering the message of herbal medicine ABC so that prospective customers can understand the advertisement". Using these topics, researchers must *crosscheck* consumers by conducting quantitative surveys.

Model II Quantitative Research Used to Facilitate Qualitative Research

For this second model, the following example can be given: In a survey of the logo of PT B found input from its employees stating that as many as 80% of its employees wanted the company logo to be changed given the times and basically the logo reflected the company's image . With the development of increasingly sophisticated information technology, PT B has abandoned old or manual service methods. For this reason, a logo change that reflects the new conditions is needed. The survey results can only reflect the wishes of the employees but cannot provide thought information what which underlies that desire. So that researchers can uncover what is implicit in that desire it should be concerned conduct qualitative

research by way of conducting interviews to employees with problems, for example:

- Why do employees want a logo change?
 - How should the new logo shape be?
 - What does the new logo message contain?
 - Is the change a modification or a total change?
- etc.

Model III Quantitative and Qualitative Approaches Given the same weight

In this third model the researcher must develop two research designs simultaneously, namely quantitative research design and qualitative research design. For quantitative research designs, survey methods, questionnaire data collection instruments, probabilistic sampling techniques, average or percentage statistical measurement tools and analysis techniques using inferential statistics. As for qualitative research design, the method uses participatory research, the data collection instruments are in the form of interview guides, samples as informants will be selected according to needs . In this model, researchers can use several different methods when taking data in the field.

This model will be applied in cases, for example "The study of the role of pink in SA's cosmetic products". After the researcher identifies the problem, the problems that arise are as follows: 1) What factors encourage SA to use pink for cosmetic products in 2005 ? B) Why are pinks their choice in 2005?

The first problem can be solved using a survey. The methods are: a) Choose employee of SA using a simple random sampling technique, b) have them fill out the prepared questionnaire first, and c) use descriptive statistics to analyze the initial results and if you want to use inferential statistical analysis, researchers can use analysis factor.

The results of the study show that among them are: a) economic factors (marketing strategies), b) trends in the world of fashion, c) relating to the target market, namely women, and d) conducting product exports with the help of color. If seen from the percentage of the picture as follows:

- The first factor is chosen by 30%
- The second factor is chosen by 30%
- The third factor is chosen as much as 20%
- The fourth factor is chosen by 20%

To answer the second problem formulation, the researcher must use a qualitative approach, the interview method. In the interview the researchers asked questions including:

- Why does the company choose pink?
- Who does product color selection?
- What is the procedure for selecting the color?
- What are the main considerations in determining colors in a particular product?

If the researcher uses this third model, the thing to remember is that the selection of respondents must be done twice. First by using probability techniques, the researcher selects respondents to fill in the questionnaire and the two researchers take another sample to be used as informants in the interview. The researcher may not use the same respondent because the person concerned uses two methods that come from different approaches. This is done so that interpolation does not occur (information one with another is contradictory, while the source is the same) in the information obtained.

Model IV Triangulation

In this fourth model researchers who use a quantitative approach as an approach in their research, verify their research findings with the results of research that uses a qualitative approach or vice versa. In the case of research, for example, a researcher wants to know "What is the standard size of a *billboard* that is commonly used for the promotion of companies in cigarette products". The researcher then conducted a survey to the offices of the advertising bureau or *billboard* maker bureaus . In his study researchers found a certain size. The researchers then perform *a crosscheck* with the way interviewed a designer or an expert in the *billboard* the field of advertising on the standard size . This model can be the opposite. The most important thing is that each research is carried out by different researchers with different samples and backgrounds.

Model of Author: The author proposes a model merger by way of :

1. The combination of data analysis produced in qualitative research in the form of primary data with quantitative secondary data.
2. Combining secondary qualitative data analysis with primary qualitative data.

The first model is done by way of doing qualitative research by interviewing or FGD. Data generated from qualitative research is the main source of information, while quantitative secondary data is used as complementary data (*complementary data*) Example: the author conducted a FGD on the needs of information and telecommunications technology services in senior high schools in Bandung. Data

from FGD results are used to answer the problem formulation of what activities can be served with IT and any other activities that require kindergarten service. Then the author also uses qualitative secondary data to answer the problem statement: "how much IT and TK service needs in high school in Bandung " Quantitative secondary data in the form of the number of senior secondary schools in West Java that cannot be obtained through FGD.

The second model can be done by the following methods : Quantitative data from the research results are used as main information to answer the formulation of the main problem and qualitative secondary data is used as supplementary data. Example Research wants to reveal the magnitude of the influence of advertisements on XYZ cellular phone products on buying decisions, the researcher must obtain data from respondents using a questionnaire to obtain quantitative data that can be used to answer the problem statement: "how much influence does XYZ cellular phone advertising have on consumer buying decisions" Qualitative secondary data in the form of detailed information about XYZ cellular phone products through brochures or *leaflets* can be used to answer the characteristic problems of the XYZ cellular phone which attract consumers to buy them.

28.3 Risks that will be encountered in research results

Combining two different approaches has risks that will be found in the research results, such as:

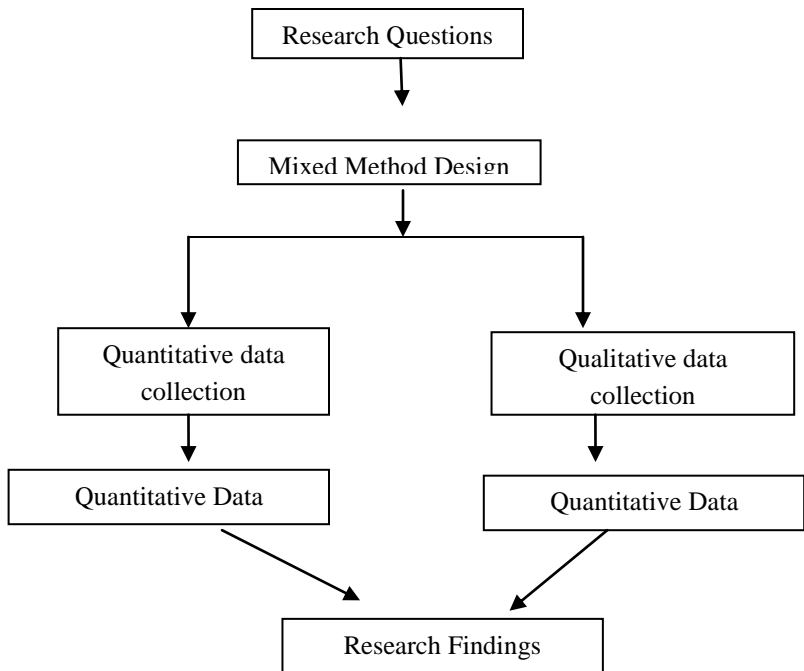
- a. Research findings are not *integrated* : Data collected using different methods will result in inconsistencies, not intact and not integrated. on the contrary, data is collected by the same method will provide consistent and integrated results. The conclusion is that mixed methods will lose integrity in the results of their research. We cannot treat different data types with one analytical tool. Different data must be analyzed using different tools, as a result the results will vary or differ from one another. Technically this is referred to as interpolation adding data or information that is sometimes incomplete but misleading. The logical consequence of such a situation is that the other data must be treated as a supplement.
- b. No or there are no ways or tools to integrate quantitative and qualitative data: Until now the author has not gotten a tool to integrate data in the form of text, images, sounds, events or combinations.
- c. Different research designs will produce different findings: Different research designs will produce different research findings. By using a different research design at the same time it will be possible to produce

different findings and even contradict one another due to the inability of the researcher to properly combine methods.

- d. The combined method is not necessarily better than a single method. If we are not a methodology expert, it would be better not to combine methods. Combining methods, furthermore, does not guarantee better results than using one method.

To be able to combine two different methods, we need the expertise and knowledge of both approaches. If we want to combine quantitative and qualitative approaches in the same study, the first thing that must be known is to recognize each approach first. If the expertise of the researcher cannot fulfill these requirements, the research will go wrong and the results of the research will be misleading. Mixed method tries to combine between quantitative and qualitative research design; accordingly there must be elements of both research types. In quantitative approach, strategies conducting the research generally includes survey and experimental research. While in qualitative approach, strategies include the following: a. ethnography, b. grounded theory, c. case study, d. phenomenological studies, and e. narrative research. Cresswell, J.W (2009) suggest the three types of combining qualitative and quantitative methods as follows: 1) Sequential mixed method procedures those in which the researcher seeks to elaborate or expand on the research findings of one method by using another method. This procedure will involve, for example, starting with a qualitative interview for exploratory purposes and then is followed up by a quantitative survey method using a large sample in order that the researcher can generalize the research results to a population. Alternatively, in the study, on the other way around, the researcher starts with a quantitative method in which a theory or concept is tested, then is followed by a qualitative method involving detailed exploration using a few cases or individuals. 2) Concurrent mixed method procedures are used when the researcher merges quantitative and qualitative data in order to provide a comprehensive analysis of the research problem. When using this design, the researcher collects both quantitative and qualitative data at the same time and then integrates those data into the information in the interpretation of the overall results. 3) Transformative mixed method procedures are conducted when the researcher employs a theoretical view point as an overarching perspective within a design that includes quantitative and qualitative data. This view point provides a framework for topics of interest, methods for collecting data, and outcomes of the research. In this scheme, the researcher can conduct data collection method involving either a sequential or a concurrent method.

While Hesse, et.all (2010), proposes a mixed method approach using a parallel mixed method design. The design is as follows :



The figure can be explained as follows: the study starts with research questions then decide to use the mixed method design. This is done by collecting both quantitative and qualitative data at the same time. Quantitative data, then, is analyzed using quantitative analysis procedure and qualitative data is analyzed using qualitative analysis procedure respectively. Both the research data analysis result will be used as the research findings.

30.4 Strategy for Minimizing Errors

To suppress the error rate in combining the two methods, the authors suggest the following:

1. Formulate the objectives of using each method or technique, for example what is the purpose of using a questionnaire? What is the purpose of using an interview guide? Do not use questionnaires for qualitative methods otherwise also do not use interviews for quantitative methods.
2. Specify and specify the type and characteristics of the data to be collected in advance . Are primary or secondary quantitative data? Are qualitative

data primary or secondary? Or is the data combined? If combined, which selection can be combined and which cannot, for example it is not possible to combine text data with interval scale data.

3. Always consider that the data to be collected must be in line with the theory. In a quantitative approach, this problem can be checked by looking at the numbers of significance (probability). In a qualitative approach, the data collected must be guided by the research objectives that have been formulated first. If the data is contrary to the theory, then the data must be replaced.
4. Look carefully and carefully in determining the steps of the research activity. If we want to do research, we have to start from the identification and formulation of the problem, and then we determine the approach, methods or techniques of quantitative or qualitative.
5. Use each research design well and obey the rules that apply. For example, do not use responses drawn using probability sampling techniques to be *interviewed* and do not ask respondents to be taken using non-probability techniques to fill out questionnaires.
6. Always adjust between data types, measurement instruments and data collection tools for research purposes; example, if we are formulate a research problem as follows: How big is the role of *Point Of Purchase* design on buying interest? "Then we need quantitative data, percentage size or average, and use a questionnaire. If the problem is, "What is the role of *Point Of Purchase* design on buying interest?" Then we need qualitative data.
7. Distinguish clearly between combining quantitative data with qualitative data combining quantitative and qualitative approaches. The first is at a practical level that can lead to potential errors. The second is on the theoretical level which if done properly and correctly will bring the right

results.

8. Don't try to quantify or measure qualitative data because the results will be dubious and are relative / bound to the conditions at which the research was conducted. Keep in mind the purpose of quantitative research is to generalize samples into the population, which cannot be done in qualitative research; for example, we create categories of interviews and then draw in a graph with numbers that show the results of interviews.

9. Don't feel right if you have qualitative data used as quantitative supporting data or vice versa. Remember that different types of data can create interpolations to add data or information that can cause errors or conflict with one another. Therefore, check repeatedly the data that has been collected whether they are in line or not.

28.5 Conclusions

From the description above, the author concludes a number of main points regarding the ways to combine the two approaches above, namely:

- Quantitative and qualitative approaches have fundamental differences related to the underlying philosophy, grounding theory and methods and techniques that have different objectives.
- Combining the two approaches is only possible on a practical level: methods and techniques, for example in collecting data thus researchers must be able to anticipate the possibility of errors that cause loss of validity of the results of the study.
- Although there are ways to combine the two approaches, the results will still not be intact and integrated.
- In the Science of Visual Communication Design can be carried out joint research, even though the absolute requirements using different methods, researchers must understand the two different methods well and correctly.

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