**RESEARCH**

**MR. BRUCE**

Course outline

Basic definitions:

1. Research
2. Historical background of research
3. Importance of research
4. Types and classifications of research
5. Research process and research cycle
6. Research protocol according to KMTC
7. Structure and format for writing an academic research

Ref: mugenda & mugenda (2000) research methods quantitative & qualitative approaches Acts Press: Nairobi, Kenya.

**Basic terms in research**

**Population** – entire group of individuals, events or objects having a common observable characteristics.

**Sample** – small group obtained from the accessible population

**Sampling** – process of selecting individuals for a study in such a way that individuals selected represent the large group from which were selected.

**Variables** – a measurable characteristics that assumes different value among subjects.

**Data** – all information a researcher gathers for his/ her study.

**Parameters** – characteristics that is measurable and can assume different values in the population.

**Statistics** – science of organizing, describing & analyzing quantitative data.

**Research –** a diligent enquiry in order to discover new facts (mugenda & mugenda (2000).

A process of collecting and colleting views and ideas from the smallest in order to make a generalization (C.K Kothari 2000)

A process of collecting and analyzing data in order to make a conclusion (Kumsa & Ngau 1984)

**History of research**

Research is as old as mankind from time memorial man made discoveries in the course of Interactions with his environment.

Ancient man made notable discoveries to include fire, locomotives and food preparation skills.

In nursing, Florence nightingale during the crinean war discovered that dressing a wound and keeping it clean in a clean environment would reduce the rate of spread of micro-organisms

Scientifically Edward Greener and loise pasture have made notable contribution

In 1950, alexander Fleming made the discovery of the century – discovered penicillin.

In human researches have also been done, the most notable was the NAZI experiment of 1945 and Tuskegee case study of (1971-1981).

For academic purposes research has been impressed as the core concept for the award of the academic papers.

**Importance of research**

1. To discover new facts and knowledge
2. To explain a theory
3. For scholarly purposes
4. Done as an occupation, to earn a living
5. To confirm a phenomena

**Definition terms**

**Researcher** a person who carries out a research

**Scholar** a person who has been to school and has engaged in literary activities to earn an academic award.

**Data** the sum of countable items

**Method** formula used to arrive at a designed site in research

**Statistics** sum of numbers

**Types of statistics**

1. Infereneral statistics
2. Descriptive statistics

**Time/ non-renewable resource** period from when you started up to when you submit a research findings

**Science** systematic knowledge of a natural or physical phenomena, truth ascertained by observation, experiment or induction.

**Types of research**

All researches can be classified into 2 based on the method of data analysis

1. **Qualitative research**

Research where data is presentable in terms of narratives form which themes are derived.

A types of research used where phenomena which cannot be presented in numerical is being research on.

1. **Quantitative research**

These are researches whose results can be expressed in numerical and figures

**NB:** a research including both qualitative and quantitative is called a collazi

**Basic research**

Is done to increase our understanding of a specific phenomena

**Applied research**

These are researches which are done with the aim of solving problem

Most scientist researchers to solve an existing problem

**Advantages of using both qualitative and quantitative methods**

1. Researcher has several objectives of study, some of these are better assessed using qualitative method while others assessed using quantitative.
2. Both methods supplement each other in that qualitative methods provide in-depth explanation while qualitative provide the hard data need to meet required objective & to test hypothesis.
3. Since both have some bias, using both types of research help to avoid such bias in that each method can be used to check the other.

**Disadvantages of using both**

Combining both methods can be prohibitively expensive

Researchers may not have sufficient training in both methods to be able to use them effectively.

**Ethical principles of research**

Research requires a lot of careful considerations for both the subject and researches to ensure that rights of the respondents are not violated.

**Nonmaleficience (do not harm)**

The researcher should not harm the respondents either intentionally or non-intentionally, emotional harm should also occur in the processes of research.

**Veracity;** principle of telling the truth alone however painful it will be

**Justice;** is the principle of fairness as a researcher always be fair in distribution of research questionnaires interventions and selection of research assistant

**Beneficence:** principle which advocates for doing well as a researcher always make sure that research and interventions makes respondents than the findings.

**Confidentiality:** all information derived from respondents must be kept secret so as not to expose the respondents to unnecessary scrutiny. Confidentiality can be ensued through use of random numbers and pseudonames.

**Features of quantitative and qualitative research**

|  |  |  |
| --- | --- | --- |
| **Quantitative** | | **Qualitative** |
| 1 | Focuses on relatively small no. of concept | Attempt to understand the phenomena in its entirely |
| 2 | Begins with preconceived ideas about how the concept are interrelated | Has few preconceived ideas and stresses the importance of people’s interpretations of events and circumstances rather than the researcher’s interpretation. |
| 3 | Uses structured procedure and formal instruments to collect information. | Collect information mainly without formal structured instruments |
| 4 | Collect information under controlled conditions | Does not attempt to control the context of the structure but rather attempt to capture the context in its entirely |
| 5 | Emphasizes objective in the collection of information | Assumes that subjective is essential for understanding of human experience. |
| 6 | Analyses numeric information through statistical procedure. | Analyses narrative information in an organized but intuitive fashion |
| 7 | Incorporated logistics, deductive reasoning | Inductive and dialectic reasoning abd predominant |
|  |  |  |

**RESEARCH PROCESS**

Research is a process which has a start (finite start) and has an end

The development of research involves various processes and stages, is to identify a research topic or problem.

**Sources of research topics or research problems**

1. Past personal experiences
2. From the current contemporary issues
3. Past incomplete researches
4. Referrals by the supervisors
5. Sponsors/ donors agencies

**Characteristics of a good research**

1. Must be brief/ succinct
2. Must be able to be expressed as a question
3. Must be able to get their respondents without using a biased criteria
4. Must have very few ethical/ legal implications
5. The findings must be realized within a short time( the period of the research)- Gantt time

**Research design**

Every research has to identify an appropriate research design for use in the study.

**Factors to consider when choosing study design**

1. Available information (state of knowledge about the problem)
2. The nature of the problem and its environment
3. The availability of resources for the study
4. The skills and creativity of researchers.

**Experimental research design**

It is one of the most complex and important research design.

Commonly used in clinical setting because of its accuracy and reliability.

Are concerned with testing hypotheses and establishing causality

The design tests the hypothesis of relationship i.e. attempts to make predictions of future outcomes based on casual model.

**Characteristics of experimental research**

1. **Manipulation**- the researcher controls the independent variable which can be an event, intervention or treatment that is expected to have some effect on the dependent variables.
2. **Control**- the researcher exercises control over the experimental situation by eliminating the actions of other possible variables beyond the independent variable. This is achieved through manipulating, randomizing and careful preparation of experimental protocols and the use of control groups.
3. **Randomizing** this is where a subject is given an equal chance to participate in the study.The researcher assigns the subject to the experimental or control group on random basis. To achieve randomization you have to first identify the respondent and then place them into groups using random tables, coin tossing or other techniques

**Advantages of research design**

1. Most powerful design for testing the hypothesis of cause effective relationship between variables.
2. It is practical feasible and can be generalized to some control over certain extraneous variables.

**Disadvantages**

In most real life situation, it is difficult to conduct a true experimental design, since some variables cannot be manipulated.

Sometimes it becomes difficult to get randomized research subjects or even control a group.

As a result of the need for randomization control and manipulate with the aim of establishing the cause effect relationship, the design become very expensive both in terms of time and money.

**Difference between experimental research design and Quasi**

In experimental, the researcher controls or manipulates the action of the action of the independent or causal variable and observe & measure the action or outcomes on dependent variable whole in quasi no control or manipulation is required.

**Descriptive/ explorative research design**

(According to Harden etal 1999) descriptive study to the systematic collection and presentation of data to give clear picture of a particular situation.

Research which involves the systematic collection of information and aims to discover & describe new facts about a situation, people, activities or event (Cormack (1982:178)

The main purposes include observing, describing and documenting all aspects of a situation as if naturally occurs.

A variety of labels are used to describe descriptive research design. These include:

1. **Explanatory**- when the researcher’s focus is to generate ideas and work on a field of inquiry that is relatively unknown.
2. **Epidemiologic-** which is a form of research that is designed to provide information on the independence & correlates of a disease or medical condition in a population for instance incidence of prevalence of Aids in specific high risk populations.

The emphasis of a descriptive research design is on maximizing the study’s credibility usefulness and feasibility.

**Categories of descriptive design**

**Explorative descriptive design**

The researcher explores a particular problem to discover what is thee and if it could be solved. Study focuses on new events, evidence or practices.

**Simple design**

Mainly a follow up of an explanatory design. The variables or interest has already been identified.

**Comparative descriptive design**

Mainly used when the researcher intends to examine and describe a particular variables in two or more groups.

**Time dimensional design**

Used in epidemiological studies and are further sub-divided into longitudinal that is when it examines changes in a group of a long period and it is cross-sectional where the data is collected at one point in time.

**Prospective study design**

Starts with present and ends by looking into the future.

**Strengths & weakness of descriptive research design**

|  |  |
| --- | --- |
| **Strength** | **weakness** |
| Lower cost | Does not answer questions of causal effect relationship nature |
| Relatively easy to implement | Expensive when complex data collection techniques are used |
| Ability to yield result in a fairly short period | May not consider variables in depth |
| Results are relatively forward to analyze and communicate to an audience | General is ability of the findings may not be achieved |

**Survey research design**

Systematic gathering of information (Benard & Marrison 1992:35)

Concerned with gathering information from a simple population

The purpose of the study is usually to identify general trends or patterns in the collected data

They are mainly cross-sectional in design. They mainly deal with (investigate) what people do e.g. what they eat

**Ways of collecting survey data**

1. Questionnaires- which are mainly self-administered
2. Telephone interviews, which involves calling people and seeking their opinions
3. Personal interviews also called face-face interviews

**Advantages of survey design**

Flexible and broad in scope

Can be applied to many people

It can focus on wide range of topics

**Case study research design**

An in depth study of one individual, a group of individuals or an institution (Brink 1996:116)

It is a detailed account of a particular experience event or situation

It is meant to provide a description of people’s thoughts, feelings and perception. Does not arm at providing a causal relationship.

**Limitation of case study**

They require plenty of time

They are costly

Have high possibility of subject drop out

Date analysis also calls for and experience, particularly if the study is carried over a long period of time.

**METHOD SECTION**

**Population and samples**

**Population** a complete set of individual, cases or objects with some common observable characteristics.

**Sample** a small group obtained from the accessible population.

**Sample size**

When time and resources allow a researcher should take a big sample

With large sample, research is confident that if another sample of size were to be selected, finding from the 2 samples would be similar to a high degree.

**METHODS OF SAMPLING**

1. **Probability sampling**

Goal is to select a reasonable number of subjects, objects or cases that represent the target population. Random sampling is the key of obtaining a representative sample.

It involves a random procedure to ensure that each unit of the sample is chosen on the basis of chance.

1. **Simple random sampling**

Each unit (subject) has the chance to be selected. It involves one stage selection. Also allows the researcher access to the study population.

Various ways of selecting the subjects exist among which are;

1. Identifying the specific target population
2. Formulating an appropriate sampling frame
3. Determine the sample size of the study
4. Adapting a consecutive identification number for each unit in the sampling frame
5. Selecting the desired subject using a randomized technique
6. **Systematic random sampling**

Selection of every element “n” from a sampling frame where “n” the sampling interval is calculated as:

N= number in population/ no. in sample using procedure each element in population has a known and equal probability of selection.

A list is arranged in alphabetical order or numerical order is not random

The rule of thumb is deciding sampling interval is to divide the total population by sampling size

**Steps**

1. List all the 1st year students in the national universities in random order e.g. (00001-12,000)
2. Determine the sample size e.g 500
3. Determine the sampling interval by dividing the total population by sample size e.g. 12,000/500 = 24
4. Blindly select from the table of random numbers the starting point because this number has to be between 0-1. You only have to consider the 1st or the last digit of the random number selected. If the number selected randomly is 05919, we should start from the student assigned the number 0 or 9 then pick the every 24th student
5. This process is continued until the required sample size is achieved.
6. **Stratified random sampling**

When sub-population considerably. It is advantageous to sample such population (stratum) independently.

**Stratification** is the process of grouping members of the population in to relatively homogeneous sub-groups e.g. by education level, socio-economic structure and so on before sampling.

1. **Cluster sampling**

Used when not possible to obtain sampling frame because population either large or scattered over a large geographical area.

It involve selection of an intact group and all members of intact group then included in a sample and each member becomes a unit of observation.

The degree of generalization of the research finding depends on the degree to which the cluster within the population are similar.

**Steps;** identifying population

1. Define the cluster forming the population
2. Determine the required sample size
3. List all clusters in random order
4. Using the table of random number, select the required no. of clusters according to sample size required
5. All members in the selected clusters are included in the sample as unit of observation.
6. **Biased sampling/ Non-probability sampling**

Used when a researcher is not interested in selecting a sample that is representative of the population.

Most qualitative study use non-probability samples because the focus is on in-depth information and not making interference or generalization.

1. **Purposive/ judgemental sampling**

This is where the researcher selects a particular group or groups based on certain criteria (Wilson 1993:179)

In this method the researcher determines who should be included in the study e.g. certain age range, religion, education level.

Commonly used in qualitative studies

**Advantages:** it gives the researcher a free hand to respond according to the judgement.

**Disadvantages:** sampling biased the possibility of unrepresentative samples and lack of generalization of the study finding.

1. **Maximum variation versus homogenous sampling**

Borg et al? Refers maximum variation as a method of sampling where effort is made to get sample containing very varied cases.

Homogenous sampling is where a sample of similar cases are selected to enable in-depth study of the group.

Maximum variation sampling enables the researcher to establish where characteristics of certain phenomenon cut across the unit of observation with maximum variation.

Selecting homogenous sample allows the researcher to select a smaller sample thus enabling the researcher to collect more intensive data.

1. **Convenience/ accidental or voluntary sampling**

Techniques involves selecting cases or units of observation as they become available to the researcher.

This type of sampling allow the utilization of any available target population e.g. radio programme debates, BP of woman using depo Provera above 40 years, you will need to take BP on any woman in contact.

1. **Quota sampling**

Technique is similar to stratified sampling and the objective include various groups or quotas of the population, in the study based on some centers e.g a researcher may want to include a certain religion or social class in the sample and therefore picks quotas of each.

Researcher purposively

1. **Snow ball sampling**

In social science research, snow ball sampling is a technique need for developing a research sample where existing study subjects recruit future subjects from among their acquaintances.

Thus the sample group appears to grow like a rolling snow ball when snow sampling is used.

Used in hidden population which is difficult for research to access e.g drug users and commercial sex workers

**Step**

In this method initial subjects with the desired characteristics are identified using purposeful sampling technique.

The few identified subject’s name others that they know have the required characteristics until the researcher gets the number of cases he/ she requires.

**Hypothesis**

When the research topic/ problem has been formulated

**Hypothesis –** a proposition statement which the researcher wants to prove right or wrong

It explains a relationship between 2 phenomena that are under study

**Types**

Alternate hypothesis: there are divergent findings contrary to the researcher’s proposition.

Null hypothesis: the research findings are always in agreement with the findings of the researcher.

The hypothesis must be tested through the co-relation between the 2 phenomena

The method used is a **chi square**

**Research objectives**

1. **Broad objective**

A re-statement of research topic including words that help explore more about the topic.

Words like; to establish, to assess, to explore, to find out are used

1. **Specific objectives**

Are several in number

They are meant to operationalize your study

It must be SMART

**NB: research proposal must be written in future tense**

**Researches are carried out at a specific time; they must be carried out at a specific place and within a specific audience.**

**A problem statement**

A statement which is used to qualify the magnitude of the problem of study.

It must be written as a continuous clause

It’s the one that quantifies the reason for carrying out research.

A problem statement must identify the very current magnitude of the problem which necessitates research.

**Purpose of the study/ research justification**

The purpose of the study is a write up on the main reason on how the study will benefit the community and the researcher

**Literature review**

Researches are never done in a vacuum and there are no virgin researches

**Sources of literature**

1. Internet

* When siting to the internet, always check the importencity of the material and avoid sites that are known for rumors e.g. Wikipedia.
* When you are siting a source form the internet, always include the site and the date of retrieval because each and every minute there are new information being retrieved
* Scholarly sites are encouraged for research purposes e.g. UNICEF, AMREF, WEBMED, KEMRI.

1. Books

* When you are referencing your book, always include the Author’s edition(S), the tittle of the book, the year of publication, the publisher, the city of publication

1. Journals

Are periodicals which are published at specific times; some are monthly, epuarterly and annually e.g. nursing journals, East African medical journal.

1. Newspapers

Newspapers are daily publications which contain stories that could be relevant to our researches

1. Unpublished thesis

Found in university libraries and in archives

NB: the sources quoted in literature must be very current (not older than 5 years)

1. Papers presented in seminars and in conferences
2. Government documents

These are reports which are produced annually or quarterly on various aspects

Can be obtained from government offices and printers

1. Grey literature

Information found from the key informers who are vast in their areas of interest or specialization.

**Assignment**

1. Describe the 3 methods and styles of referencing literature. (Harvard’s methods of referencing literature)
2. Differentiate between probability and non-probability sampling
   1. Different methods of probability sampling
   2. Non-probability methods of sampling
   3. How to determine sample size (using Andrew fischer et al method of 1998; mugenda & mugenda 2000)

**Methods of referencing literature**

There are several methods of referencing literature. APA is the most common method being used.

**American Psychology Association (APA)**

When using APA the sir name is used when quoting literature.

**Rules of APA**

* When APA method only the sir name is used when quoting literature.
* If participants in writing should be started with in 5 or less than 5 e.g (Otieno, 2003)
* If more than 5 choose one then write (Orangi et al, 2001)
* If the author is not indicated e.g. in magazine, then site the editor, type the magazine & date e.g (kipkoech Tanui Daily Nation 12/6/2015)
* In APA there is no siting/ saying people’s title. If otherwise write name and title in bracket. Orangi (Phd)
* When doing direct sitation opening and closing inverted commas (“”) must be used and the date or year and age must be shown

**METHODS OF RESEARCH**

1. Experimental research
2. Normative research
3. Historical research
4. **Experimental research**