RESEARCH ELEMENTS

STEPS IN RESEARCH PROCESS

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- 1. Research Problem
- 2. Literature Review
- 3. Objectives
- 4. Research Design
  - Sample Design
- 5. Data Collection
- 6. Data Analysis
- 7. Generalization and Interpretation
- 8. Reporting

STEP 3: OBJECTIVES

- Objectives are the goals set out to attain in a study.
- Word them clearly and specifically.
- Objectives should be listed under two headings:
  - a) Main objectives
  - b) Sub-objectives

STEP 3: OBJECTIVES

- a) Main objectives
  - Overall statement of the thrust of your study
  - Main relationships that will be established
- b) Sub-objectives
  - Specific aspects within the main framework
  - Should be numerically listed
  - Wording should specifically communicate the intentions
  - Should contain only one aspect of the study
  - Use action oriented words

STEP 3: OBJECTIVES

- The objectives should start with words such as
  - ‘to determine’
  - ‘to find out’
  - ‘to ascertain’
  - ‘to measure’
  - ‘to explore’ etc.
- Determines the type of research
  - Descriptive
  - Correlational
  - Experimental

TYPES OF QUESTION

- **Descriptive**
  - When a study is designed primarily to describe what is going on or what exists. Public opinion polls that seek only to describe the proportion of people who hold various opinions are primarily descriptive in nature. For instance, if we want to know what percent of the population would vote for a Democratic or a Islamist in the next election, we are simply interested in describing something.

TYPES OF QUESTION

- **Correlational**
  - When a study is designed to look at the relationships between two or more variables. A public opinion poll that compares what proportion of males and females say they would vote for a Democratic or a Islamist candidate in the next general election is essentially studying the relationship between gender and voting preference.

TYPES OF QUESTION

- **Causal or Experimental**
  - When a study is designed to determine whether one or more variables (e.g., a program or treatment variable) causes or affects one or more outcome variables. If we did a public opinion poll to try to determine whether a recent political advertising campaign changed voter preferences, we would essentially be studying whether the campaign (cause) changed the proportion of voters who would vote Democratic or Islamist (effect).

TITLE: AN INVESTIGATION INTO THE STUDENT USE OF E-BOOKS AT BOLTON UNIVERSITY.

- **Aims**

Many academic libraries have expanded their library provision by the acquisition of e-books. Despite this strategic direction, the literature reveals that relatively little is known about student perceptions and attitudes towards e-books. Consequently, this research aims to narrow this research gap and conduct empirical research into student perceptions towards e-books and their frequency of use. The results will be used to provide recommendations to library management to improve the quality of service provision regarding e-books.

TITLE: AN INVESTIGATION INTO THE STUDENT USE OF E-BOOKS AT BOLTON UNIVERSITY.

- **Research Objectives.**

The above aim will be accomplished by fulfilling the following research objectives:

1. Review the literature concerning the student uptake and experience of e-books in academic libraries.

2. Investigate perceptions and attitudes towards e-books and the usage of e-books at the University of Bolton.

3. Compare usage statistics between various user-groups, e.g. full-time, part-time, course type, etc.

4. Identify if any improvements or alterations are required to facilitate a high service quality provision in relation to the e-books service at Bolton University library.

RESEARCH QUESTION

- Based on mature theory
  - tend to describe relations between established constructs
- Based on emerging theory
  - tend to be more open ended about the problem of interest.

OBJECTIVES: CHARACTERISTICS

- **Variables**
  - A perception or concept that can be measured
    - capable of taking on different values
- **Identifying Variables**
  - The concepts should be measurable
  - Techniques and knowledge about variables
    - play an important role

DIFFERENCE BETWEEN CONCEPT AND VARIABLE

- Concepts are perceptions
  - Their meaning varies markedly from individual to individual
  - A concept cannot be measured
- A variable can be measured
  - crude/refined, subjective/objective
- It is therefore important for the concept to be converted into variables

CONCEPT AND VARIABLES

Concept	Variable
Effectiveness	Sex (male/female)
Satisfaction	Income (Rs……)
Impact	Age
Self esteem	Height
Quality	Weight

STEP 4: RESEARCH DESIGN

- The conceptual structure to conduct the research
- To provide the collection of relevant information
- Consideration
  - a) Objectives of the research study
  - b) Method of data collection
  - c) Sample design
  - d) Tool for data collection
  - e) Data Analysis-- qualitative and quantitative

A) OBJECTIVES OF THE RESEARCH STUDY

- Objectives identified to answer the research questions have to be listed
  - a) Numbered
  - b) Statement begins with an action verb.

B) METHOD OF DATA COLLECTION

- Observation Method
- Experimental Method

B) METHOD OF DATA COLLECTION: OBSERVATION METHOD

- Direct observation of
  - People, actions and situations
  - Without asking from the respondent.
- Observation can yield information which people are normally unwilling or unable to provide
  - Observing e-learning behaviors
  - Graph traversal properties
  - SE production in unsuitable environments

TYPES OF OBSERVATION

- Structured
  - for descriptive research
- Unstructured
  - for exploratory research
- Participant Observation
- Non- participant observation
- Disguised observation
- **Limitations:**
  - feelings, beliefs and attitudes cannot be observed
  - expensive method
  - often supplement observation with survey research.

SURVEY METHOD

- Structured Surveys
  - use formal lists of questions asked of all respondents in the same way.
- Unstructured Surveys
  - Researcher probe respondents and guide the interview according to their answers.

SURVEY METHOD

- Survey research may be Direct or Indirect.
- Direct Approach
  - The researcher asks direct questions about behaviors and thoughts.
  - Why you wasted 3 months in coding
- Indirect Approach
  - Indirectly provoking the thoughts
  - How much time should be given for programming

SURVEY METHOD

- Advantages
  - Can be used to collect many different kinds of information
  - Quick and low cost as compared to observation and experimental method.
- Limitations
  - Respondent's reluctance about private things
  - Busy people may not want to take the time
  - May try to help by giving pleasant answers
  - Unable to answer because they cannot remember
  - May answer in order to look smart or well informed.

SURVEY METHOD

- Contact Methods
  - Information may be collected by
    - Mail
    - Telephone
    - Personal interview

SURVEY METHOD: MAIL QUESTIONNAIRES

- Advantages:
  - Collect large amounts of information at a low cost per respondent.
  - May get more honest answers to personal questions
  - Respondent's can answer when they have time
  - Good way to reach people who often travel
- Limitations:
  - Not flexible
  - Take longer to complete than telephone or personal interview
  - Response rate is often very low
  - Researcher has no control over who answers.

SURVEY METHOD: TELEPHONE INTERVIEWING

- Advantages
  - Quick method
  - Response rate tends to be higher than mail
  - More flexible as interviewer can explain questions not understood
  - Can skip some Qs and probe more on others
  - Allows greater sample control
- Disadvantages
  - Cost per respondent higher
  - Some people may not want to discuss personal Qs with interviewer
  - Manner of speaking may affect the respondent's answers

SURVEY METHOD: PERSONAL INTERVIEWING

- Advantages
  - Very flexible
  - Can collect large amounts of information.
  - Can hold the respondent's attention
  - Clarify difficult questions.
  - Explore issues, and probe as the situation requires.
  - Can show actual products, advertisements, packages
    - observe the reactions and behavior.

SURVEY METHOD: PERSONAL INTERVIEWING

- Disadvantages
  - Cost: may cost more than telephone survey
  - Sampling: keep small sample size to keep time and cost down,
    - it may be difficult to generalize from the results.
  - Interviewer bias.

EXPERIMENTAL METHOD

- Also called
  - Empirical Research
  - Cause and effect method
- It is a data-based research
  - Coming up with conclusions
  - Capable of being verified with observation or experiment.

EXPERIMENTAL METHOD

- Appropriate when proof is sought that
  - certain variables affect other variables in some way.
- Class participation (independent variable) affect grades (dependent variable)
- Higher education improves job security
- Research projects/classes affect analytical thinking

EXPERIMENTAL METHOD

- The researcher controls all variables and deliberately manipulates one of them to study its effects.
- Researcher must provide a working hypothesis
  - guess the probable results.
- Then work to get enough facts (data)
  - to prove or disprove the hypothesis.
- Considered as the most powerful support for a given hypothesis

C) SAMPLE DESIGN

- Researchers usually draw conclusions about large groups by taking a **sample**
  - A Sample is a segment of the population selected to represent the population as a whole.
  - Representative of the larger population

SAMPLE DESIGN

- Three concerns
  - The Sample
    - Who will be surveyed?
    - Students/professionals/doctors etc.
  - Sample Size
    - How many people will be surveyed?
    - Large samples give more reliable results than small samples.
  - Sampling
    - How should the sample be chosen?
    - Sample members may be chosen at random from the entire population (probability sample)
    - The researcher might select people who are easier to obtain information from (nonprobability sample)

D) DATA COLLECTION TOOL

- Most important aspect of a research project
  - All findings are based upon the collected information
  - The collected data dependent upon the asked questions
- "garbage in garbage out"
- The research tool provides the input
  - therefore the quality and validity of the output (the findings), are solely dependent on it.

THE QUESTIONNAIRE

- Surveys/ interviews employ the use of a **questionnaire**
  - A questionnaire consists of a set of questions presented to a respondent for answers.
- Because there are many ways to ask questions, the questionnaire is very flexible.
- Questionnaire should be developed and tested carefully before being used on a large scale.

THE QUESTIONNAIRE

- There are three basic types of questionnaire:
  - Closed – ended
  - Open – ended
  - Combination of both

CLOSED ENDED QUESTIONNAIRE

- Closed ended questions include all possible answers/prewritten response categories
  - respondents are asked to choose among them.
  - multiple choice questions
- Used to generate statistics in quantitative research.
- Follow a set format
  - Can be entered easily analyzed through computers

OPEN-ENDED QUESTIONNAIRE

- Allows respondents to answer in their own words.
- Closed ended questionnaires
  - How many people use a service
- Open-ended questionnaires
  - What people think about a service
- Data analysis is more complex
  - No standard answers to these questions

COMBINATION OF BOTH

- To find out
  - How many people use a service and
  - What they think of the service in the same form

- Begins with a series of closed –ended questions
- Finishes with a section of open-ended questions

HOW TO CONSTRUCT QUESTIONNAIRES

- Deciding which questionnaire to use-
  - Closed or open ended,
  - Self or interviewer administered
- Wording and structure of questions
- Questions should be kept short and simple
  - avoid asking two questions in one
- Avoid negative questions
  - Which is not one of the distinct features of IP v.4?

HOW TO CONSTRUCT QUESTIONNAIRES

- Question should not contain Prestige Bias
  - causing embarrassment
  - forcing the respondent to give false answer in order to look good.
  - Questions about educational qualification or income
- Use indirect questions for sensitive issues
  - respondents can relate their answer to other people .

HOW TO CONSTRUCT QUESTIONNAIRES

- Using closed ended questions
  - Make sure that all possible answers are covered
  - "Don't Know"/N-A category also needs to be added.
- Avoiding Leading Question
  - Don't lead the respondent to answer in a certain way
  - "How often do you wash your car?"
    - assumes that respondent has a car and he washes his car.
  - Instead, ask a filter question to find if he has a car, and then, 'If you wash your car, how many times a year?'

HOW TO CONSTRUCT QUESTIONNAIRES

- Length and ordering of the Questions:
  - Keep the questionnaire as short as possible
  - If combined questionnaire,
    - Keep open ended Qs for the end.
  - Make Qs as interesting and easy to follow
    - Varying type and length of question
  - Group the Qs into specific topic
    - Easier to understand and follow.

STEP 5: DATA COLLECTION

- Collecting data through any of the methods may involve some ethical issues in relation to the **participants** and the **researcher**
  - Those from whom information is collected or those who are studied by a researcher become *participants* of the study.
  - Anyone who collects information for a specific purpose, adhering to the accepted code of conduct, is a *researcher*.

ETHICAL ISSUES

- Ethical issues concerning
  - a) Research participants
  - b) Researcher

- There are many ethical issues in relation to participants and researcher of a research activity.

ETHICAL ISSUES: RESEARCH PARTICIPANTS

- i) Collecting information:
  - Manner
    - Your request for information may put pressure or create anxiety on a respondent.
  - Consent
    - First obtain the respondents' informed consent.
  - Time
    - If you cannot justify the relevance of the research
      - you are wasting your respondents' time

ETHICAL ISSUES: RESEARCH PARTICIPANTS

- ii) Providing incentives:
  - Most people do not participate in a study because of incentives, but because they realize the importance of the study.
  - Is it ethical to provide incentives to respondents to share information with you because they are giving their time?
  - Giving a present before data collection is unethical.

ETHICAL ISSUES: RESEARCH PARTICIPANTS

- iii)Seeking sensitive information:
  - Certain types of information can be regarded as sensitive or confidential by some people and thus an invasion to their privacy, asking for such information may upset or embarrass a respondent.

ETHICAL ISSUES: RESEARCH PARTICIPANTS

- iv) The possibility of causing harm to participant:
  - When you collect data from respondents or involve subjects in an experiment, you need to examine carefully whether their involvement is likely to harm them in any way.
  - Harm includes discomfort, anxiety, harassment, invasion of privacy, or dehumanizing procedures.
- v) Maintaining confidentiality:
  - Sharing information about a respondent with others for purposes other than research is unethical.
  - It is unethical to identify an individual's responses.

ETHICAL ISSUES: RESEARCHER

- i) Avoiding bias:
  - **Bias** on the part of the researcher is unethical.
    - Bias is a deliberate attempt to either hide what you have found in your study, or highlight something disproportionately to its true existence.

- ii) Provision or deprivation of a treatment:
  - Is it ethical to provide a study population with an intervention/ treatment that has not yet been conclusively proven effective or beneficial?
  - But if you do not test, how can you prove or disprove its effectiveness or benefits?

ETHICAL ISSUES: RESEARCHER

- iii) Using inappropriate research methodology:
  - It is unethical to use a method or procedure you know to be inappropriate
    - Selecting a highly biased sample
    - Using an invalid instrument
    - Drawing wrong conclusions.

ETHICAL ISSUES: RESEARCHER

- iv) Incorrect reporting:
  - To report the findings in a way that changes or slants them to serve your own or someone else's interest, is unethical.

ETHICAL ISSUES: RESEARCHER

- v) Inappropriate use of the information:
  - The use of information in a way that directly or indirectly adversely affects the respondents is unethical.
  - Should you ask respondents for information that is likely to be used against them?
  - It is ethical to ask questions provided you tell respondents of the potential use of the information, including the possibility of it being used against some of them, and you let them decide if they want to participate.

STEP 6: DATA ANALYSIS

- Summarizing the collected data
- Organizing them
  - in a manner that they answer the research questions (objectives).

DATA PROCESSING OPERATIONS

- Editing
  - Examining the collected raw data to detect errors and omissions and to correct these when possible.
- Classification
  - Arranging data in groups or classes on the basis of common characteristics.

DATA ANALYSIS METHODS: QUALITATIVE

- Few rigid rules and procedures.
- Done by the process
  - Content Analysis
  - analysis of the contents of an interview in order to identify the main themes that emerge from the responses
- This process involves a number of steps:

QUANTITATIVE DATA ANALYSIS

- Most suitable for large surveys using properly constructed and worded questionnaire.
- Data can be analyzed
  - manually or with the help of a computer .
  - knowledge of statistics plays an important role.
  - SPSS

7. GENERALIZATION AND INTERPRETATION

- Generalize your findings to other context not explored in the current study.
- Interpret the results to make them more generalized
  - Insights that can be observed only by the researcher but not others.

STEP 8: REPORTING THE FINDINGS

- The last and the most difficult step
  - What you have done
  - What you have discovered
  - What conclusions can be drawn from your findings
- The report should be written in an academic style
  - Formal and not journalistic