RM U3

Q. State and Explain major sources of errors in Survey Research .

Ans. Survey research is a widely used method for gathering data, but it is subject to various sources of errors that can impact the reliability and validity of the findings. These errors can arise at any stage of the survey process, from design to data collection to analysis. Here are some of the major sources of errors in survey research, along with explanations:

1. Sampling Error- Sampling error occurs when the sample selected does not perfectly represent the population, leading to differences between the sample estimate and the true population value.

Example: If a survey about the average income in a city only samples people from wealthy neighborhoods, the result will overestimate the city's average income.

2. Non-Sampling Error- Non-sampling errors are errors that arise in survey research due to issues unrelated to the act of sampling. These can occur in any phase of the survey process.

- **Example**: A researcher accidentally misrecords a respondent's age as 35 instead of 53, leading to an incorrect data entry.

3. Measurement Error - Measurement error occurs when the survey instrument (e.g., questions, scales) produces inaccurate results, either due to poor design or respondent misunderstanding.

- **Example**: A question asks, “How often do you exercise per week?” but the answer options (e.g., “never,” “sometimes,” “always”) are too vague, leading to inconsistent or inaccurate responses.

4. Coverage Error - Coverage error happens when the survey sample does not adequately represent the entire population, either by excluding certain groups or over-representing others.

- **Example**: If a survey on internet usage is conducted only via online surveys, it excludes people who do not have internet access, leading to a biased sample.

5. Selection Bias - Selection bias occurs when the individuals selected for the survey are not representative of the broader population, often due to self-selection or non-random sampling.

- **Example**: A phone survey about customer satisfaction with a product might over-represent younger people who are more likely to answer their phones, while excluding older customers who may not be as responsive.

6. Processing Errors - Processing errors are mistakes made during data entry, coding, or analysis of survey data.

- **Example**: A researcher enters the wrong value into the database, such as typing "100" instead of "10," which distorts the analysis.

7. Interviewer Bias - Interviewer bias occurs when the interviewer unintentionally influences the responses of participants through their tone, body language, or behavior.

- **Example**: An interviewer nods approvingly when a respondent gives an answer, unintentionally encouraging them to repeat the same type of response in future questions.

8. Social Desirability Bias - Social desirability bias happens when respondents answer questions in a way they believe will be viewed favorably by others, rather than truthfully.

- **Example**: A person in a survey about drinking alcohol may underreport their consumption to appear more socially acceptable, even though they drink regularly.

9. Recall Bias - Recall bias occurs when respondents have difficulty remembering past events or experiences accurately.

- **Example**: A person being asked to recall how often they visited the doctor in the past year may forget certain visits, leading to an underreporting of healthcare usage.

10. Questionnaire Design Issues - Errors caused by poorly designed questions, such as ambiguity, leading questions, or questions that combine multiple concepts.

- **Example**: A question like "How satisfied are you with the customer service and the product quality?" is unclear because it combines two different issues, making it hard for respondents to answer accurately.

11. Time-Related Errors - Time-related errors occur when the timing of the survey affects the results, such as seasonal variations or events that influence people's responses.

- **Example**: A survey on public opinion about the economy conducted right after a major economic crisis may lead to more negative responses, not reflective of people's general views.

Q2. Explain Type of Survey Telephone, Mail , Internet , Quesstinonnaire .

Ans. Surveys can be conducted in various ways, each with its advantages and disadvantages. Below are explanations of the **types of surveys**: **Telephone**, **Mail**, **Internet**, and **Questionnaire** (which can be broadly understood as a written survey, but I'll also explain how it can be used across different methods). I'll explain each method and provide a simple example.

1. Telephone Surveys - A telephone survey involves asking respondents questions over the phone. The interviewer calls people from a list and records their responses. An interviewer or automated system calls participants, asks questions, and records answers either manually or through a system.

- **Example**: A company calls customers to ask how satisfied they are with a recent purchase. The interviewer asks, “On a scale of 1 to 5, how satisfied are you with the product?”

2. Mail Surveys -: A mail survey involves sending a written questionnaire to respondents through the postal service. Respondents complete the questionnaire and return it by mail.The researcher sends a set of questions in the mail (usually with a stamped return envelope), and the respondent fills it out and sends it back.

- **Example**: A local city government sends a survey to residents asking for feedback on public services. The questionnaire might include questions like, “How satisfied are you with the city’s trash collection service?” with response options ranging from “Very Satisfied” to “Very Dissatisfied.”

3. Internet Surveys - An internet survey is conducted online, where respondents answer questions on a website or via an online survey tool (such as Google Forms, SurveyMonkey, etc.). Respondents receive an email or a link to an online survey, which they can fill out at their convenience. The responses are automatically recorded and stored in a database.

- **Example**: A company may send an email asking customers to fill out an online survey to rate their shopping experience. The survey might include questions like, “How easy was it to find what you were looking for on our website?” with answers like “Very Easy” or “Very Difficult.”

4. Questionnaire (Written or Paper Surveys) - A **questionnaire** is a structured set of written questions used to gather information. It can be part of any survey type (telephone, mail, or internet) and is the tool that researchers use to collect data. A questionnaire consists of a series of questions that respondents answer. It can be administered in various formats (e.g., online form, paper form, telephone script).

- **Example**: A health clinic might ask patients to fill out a questionnaire during their visit, asking questions like, “How often do you exercise?” or “Do you smoke?”

Q3. List and Explain Type of Observational Technique

Ans. **Observational techniques** are methods of data collection where researchers observe subjects in a natural or controlled setting to gather information. Observational research allows researchers to collect data without relying on participants' self-reports, making it especially valuable for studying behaviors that people might not be able to articulate or might be unwilling to admit. There are several types of observational techniques, each with different methods, advantages, and limitations.

1. Naturalistic Observation - In naturalistic observation, the researcher observes subjects in their natural environment without interfering or manipulating the situation. The researcher watches and records behavior as it naturally occurs, without any intervention. The setting could be anything from a public park to a workplace or even a classroom.

- **Example**: A researcher observes how children interact with each other during recess in a school playground, noting behaviors like sharing, cooperation, or aggression.

2. Participant Observation - In participant observation, the researcher actively engages in the activities or environment they are observing. The researcher becomes part of the group or situation to gain deeper insight into the behavior or culture. The researcher may take on a role within the group being studied, either openly as a member of the group or covertly, without the group's knowledge. This allows the researcher to gather information from the inside.

- **Example**: An anthropologist may live within a remote community to study their daily practices, such as food preparation and social interactions, while participating in these activities.

3. Non-Participant Observation - Non-participant observation occurs when the researcher observes the group or environment without becoming involved in the activities or interactions. The researcher remains an outsider. The researcher watches the subject(s) from a distance, often taking detailed notes or recording behaviors, but does not participate or intervene in any way.

- **Example**: A sociologist sits in a coffee shop and watches how people interact with each other, noting body language, conversation topics, or group dynamics without participating in the conversations.

4. Structured Observation - In structured observation, the researcher has a clear, predefined set of behaviors or events they are observing and recording. This approach is highly focused and systematic.The researcher uses specific criteria or categories to observe and record certain types of behaviors. This can be done using checklists, rating scales, or coding systems.

- **Example**: A researcher studying classroom behavior might have a checklist of specific behaviors (e.g., "raising hand," "talking out of turn") and records how many times each behavior occurs during a class period.

Observational techniques provide valuable insights into real-world behavior, but they also come with various challenges, such as bias, ethical considerations, and limitations in control over the environment. Researchers often decide between structured or unstructured approaches based on the level of detail needed, and whether they want to be involved in the group or remain an outsider.

Q4. Explain Exerimental Design for Research . 1) Satic group design 2)one short deisgn

Ans. **Experimental Design** is a research method used to determine the cause-and-effect relationship between variables by manipulating one or more independent variables and observing the effect on the dependent variable(s). Experimental designs involve controlling extraneous variables to ensure that any changes in the dependent variable are due to the manipulation of the independent variable.

Two types of experimental designs that are commonly used, but are less rigorous than randomized controlled trials, are the **Static Group Design** and the **One-Shot Case Study Design**. Below, I explain each design with simple examples:

1. Static Group Design -The Static Group Design is a type of quasi-experimental design where two different groups are studied: one is exposed to a treatment or intervention, and the other serves as a comparison group. There is no random assignment to groups, and the groups are observed after the treatment or intervention.In this design, researchers select groups of subjects that already exist (i.e., there is no random assignment). One group receives the treatment or intervention, while the other group does not. Afterward, the outcomes for both groups are compared.

- **Structure**:
  - **Group 1 (Treatment Group)**: Receives the experimental treatment or intervention.
  - **Group 2 (Comparison Group)**: Does not receive the treatment (often called a control group, but not a true control because it is not randomly assigned).
  - **Outcome**: Both groups are observed, and their results are compared to infer if the treatment had an effect.
- **Example**:
  Imagine a researcher studying the impact of a new teaching method on student performance.
  - **Group 1 (Treatment Group)**: Students who are taught using the new teaching method.
  - **Group 2 (Comparison Group)**: Students who are taught using the traditional teaching method.
    After the treatment, both groups are tested on the same subject, and their test scores are compared to see if the new method improved student performance.

2. One-Shot Case Study Design - The One-Shot Case Study Design is an experimental design where a single group is exposed to a treatment or intervention, and then the outcome is measured once after the treatment. This design is also a type of quasi-experiment and does not involve a control group or random assignment.: In this design, the researcher applies an intervention or treatment to a single group of subjects and measures the effect of the treatment immediately afterward. There is no pre-test or baseline measurement, and no comparison to a control group, making this a relatively weak form of experimental design.

- **Structure**:
  - **Group (Treatment Group)**: Receives the treatment or intervention.
  - **Outcome Measurement**: The group is tested or measured on the dependent variable immediately after the intervention.
- **Example**:
  A researcher wants to study the impact of a new stress-reduction workshop on employees' stress levels.
  - The employees (the group) attend the stress-reduction workshop.

- After the workshop, their stress levels are measured (e.g., using a survey or psychological test).
  The researcher compares the post-workshop stress levels to see if there was a noticeable change.

Q5. Steps In Experimental Research

Ans. Experimental research involves systematically manipulating one or more independent variables to determine their effect on a dependent variable, all while controlling extraneous factors. The goal is to establish cause-and-effect relationships between variables. Here's a breakdown of the steps in experimental research, with simple examples for each:

1. **Identify the Research Problem** - The first step is to clearly define the research question or problem you want to investigate.

- Example: A researcher wants to find out whether a new study technique (e.g., spaced repetition) improves student performance on exams. The research problem might be: *"Does using spaced repetition improve exam scores in high school students?*

2. **Review Literature and Develop a Hypothesis** - Conduct a literature review to understand what has already been studied on the topic and develop a hypothesis — a testable statement predicting the outcome of the experiment.

- Example : Based on previous research, the researcher might hypothesize: *"Students who use spaced repetition will score higher on their exams than students who study using traditional methods.*

3. **Define Variables** - Identify and define the independent variable (the factor being manipulated) and the dependent variable (the outcome being measured).

- Example:
  - Independent variable: Study technique (spaced repetition vs. traditional study methods).
  - Dependent variable: Exam scores.

4. **Select Participant** - Choose a sample of participants from the population you are studying. This step may involve random selection to ensure the sample is representative, or using specific inclusion criteria depending on the research design.

- Example: The researcher selects 50 high school students who are preparing for the same exam. The students are randomly assigned to either the spaced repetition group or the traditional study group.

5. Assign Participants to Groups - Randomly assign participants to experimental and control groups. Random assignment helps reduce bias and ensures that differences between the groups are due to the manipulation of the independent variable, not other factors.

- **Example**: The 50 students are randomly assigned to two groups:
  - **Group 1**: 25 students use spaced repetition techniques to study.
  - **Group 2**: 25 students use traditional study methods (e.g., reviewing notes).

8. Collect Data - Measure the dependent variable(s) after the manipulation of the independent variable. This step involves gathering data from both the experimental and control groups.

- **Example**: After a set study period (e.g., two weeks), the researcher administers the same exam to all 50 students and records their scores

9. Analyze the Data - Analyze the data collected to determine if the independent variable had an effect on the dependent variable. Statistical tests, such as t-tests or ANOVAs, can help determine whether differences between groups are statistically significant**.**

- **Example**: The researcher compares the average exam scores of the two groups using a t-test to see if there is a statistically significant difference between the scores of students using spaced repetition and those using traditional methods.

10. Interpret Result - Draw conclusions based on the data analysis. Determine whether the hypothesis is supported or not, and discuss the implications of the findings.

- **Example**: If students using spaced repetition scored significantly higher on the exam, the researcher concludes that spaced repetition improves exam performance. If there is no significant difference, the researcher may conclude that the method does not have an effect, or that other factors (e.g., study habits, prior knowledge) may have influenced the results.