Population, sampling and errors (2)
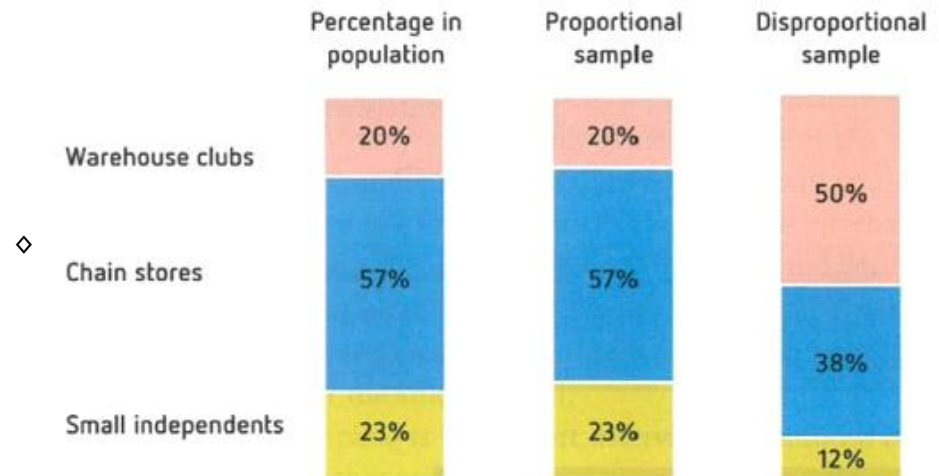
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Population (universe)
- Any complete group that shares some common set of characteristics
- Population element
  - Individual member of population
- Census
 - Investigation of all individual elements that make up a population

Sample
- Subset of the population
- Using a portion of a population to make conclusions about the whole population
- Pragmatic reasons
  - Budget
  - Time
  - Can still be relatively accurate and reliable
  - Destruction of test results is easier
- Probability sampling
  - Representative of the population
- Sampling unit
  - Single element or group of elements subject to selection in the sample
  - Does not have to be a person
    - E.g. Phone numbers
  - Levels
    - Primary sampling units
      - Unit equates to population element
      - Units selected in the 1st of
      - E.g. Flights
    - Secondary
      - E.g. Passengers on flight
    - Tertiary
      - E.g. Passengers on flight with kids
- Process (holistic and not step-by-step)
  - Defining target population
    - Who
    - Operationally define so that ideal data collection sources can be identified
  - Select a sampling frame
    - List of elements from which a sample may be drawn
    - Working population
    - E.g. List of students from registrar's office at a university
  - Determine if probability or non-probability sampling used
    - Probability
      - Technique in which every member of a population has a known, non-zero probability of selection
      - Simple random sampling
        - Selecting a sample at random from a sampling frame
        - Sampling with replacement
          - E.g. Take names out of hat, then place it back in the hat
        - Sampling without replacement
          - E.g. Lottery where balls are not placed back in the machine
      - Systematic
        - Selecting items at systematic or regular intervals from the sampling frame
        - E.g. Sample every third household in a neighbourhood
      - Stratified
        - Sample based on some known characteristic of the population that will have an impact on the research
        - Dividing the sampling frame into mutually exclusive strata (e.g. gender - males vs female) and then randomly sample within each strata

- ◆ Types
  - ◇ Proportional
  - ◇ Disproportional
  - ◇

	Percentage in population	Proportional sample	Disproportional sample
Warehouse clubs	20%	20%	50%
Chain stores	57%	57%	38%
Small independents	23%	23%	12%

- □ Cluster sampling
  - ◆ Units of people who make up the population are to be found in groups
  - ◆ Sampling occurs by randomly selecting a sample of the clusters to study, rather than randomly selecting from the population
  - ◆ Efficient with populations that are geographically spread out
  - ◆ Researcher identifies all of the clusters within the population and randomly selects units or individuals from all of the clusters to include in the study
  - ◆ Cluster should be as heterogenous as the population itself
    - ◇ Unlike a strata
  - ◆ Types
    - ◇ 1-stage cluster sample
      - ▶ Consists of all elements in the selected subsets
    - ◇ 2-stage cluster
      - ▶ Sample of elements is chosen in some probabilistic manner from the selected subsets
  - ◆
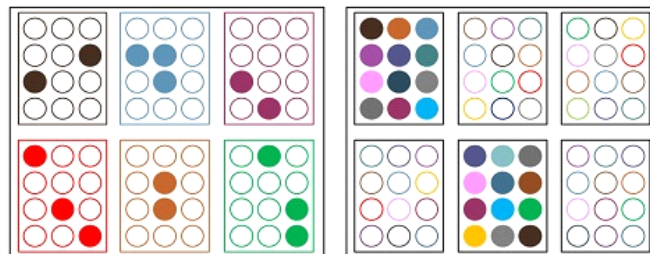
Stratified Sampling Vs Cluster Sampling

  - ◆ Examples
    - ◇ Uni students by tutorial classes

Population element	Possible clusters in Australia
Australian adult population	States
	Localities
	Local government areas
	Postcodes
	Census collection districts
	Households
University students	Residential colleges
	Tutorial classes

	Tutorial classes
Airline travellers	Airports
	Planes
Sports fans	Sports stadia
	Recreation parks
	Indoor sporting venues

- Non-probability
  - Technique in which units of the sample are selected on the basis of personal judgment or convenience
  - Probability of any particular member of the population being chosen is unknown
  - Selected to represent the population but cannot be representative of the population in a statistical sense
  - Not possible to develop a sampling frame/population list
    - E.g. Loyalty among consumers of Cosmopolitan magazine
  - Judgemental sampling
    - Researcher makes a judgment about who or what to include in the sample
    - E.g. Key informants on the topic
  - Quota sampling
    - Ensures various subgroups of a population will be represented on pertinent characteristics
    - E.g. 25 males and 25 females of student population
  - Snowball sampling
    - Initial respondents are selected by probability methods and additional respondents are obtained from information provided by the initial respondents
    - Stops when the researcher reaches saturation point
      - When the researcher no longer hears any novel thoughts, feelings, attitudes, emotions, intentions, etc
      - Continuing to engage participants would not be useful, necessary or ethically sound
  - Convenience sampling
    - Sampling procedure of obtaining those people who are most conveniently available
- Plan procedure for selecting sampling units
- Determine sample size
- Select actual sampling units
- Conduct fieldwork

Deciding on sampling method
- Qual or quant
  - Implications on sample size
- Degree of precision
  - Preliminary insights?
  - Making predictions or inductive inferences?
  - Probability methods are better for conclusive projects that demand accuracy
- Time and resource
  - Tight budget
  - How quickly does project have to be completed?
  - Non-probability methods are better for projects with constraints
- Access
  - Are there complete lists of the defined target population elements
  - How easy or difficult is it to generate the required sampling frame of prospective respondents?
- Research scope
  - Is the research going to be international, national, regional or local?

- ○ Cluster samples are better when population elements are unequally distributed geographically
- • Analysis needs
    - ○ To what extent are accurate statistical projections and/or hypothesis testing required

Bias
- ▪ Anything that contaminates or compromises the research
- ▪ At any stage in the design
- ▪ Types
    - ○ **Researcher bias**
        - ▪ **Particular perspective that the researcher takes which highlights some aspects or findings of the research**
        - ▪ While ignoring or hiding others
        - ▪ E.g. Learning towards a particular finding
    - ○ Random sampling error
        - ○ **Statistical fluctuation that occurs because of chance variation in the elements selected for a sample**
        - ○ **Difference between the sample results and the result of a census conducted using identical procedures**
        - ○ Sample not likely to perfectly represent the population
        - ○ Occasionally a large RSE occurs because too many atypical people were included in the sample
        - ○ Unavoidable
        - ○ Can be estimated by calculating confidence intervals
    - ○ **Systematic error**
        - ○ **Results from nature of a study's design**
            - □ E.g. Wording and emphasis
            - □ E.g. Recording some things and not others
        - ○ Not due to chance fluctuations
        - ○ **Sample bias**
            - ▪ **Tendency of the results of a sample to deviate in one direction from the true value of the population parameter**
            - ▪ **Sampling frame error**
                - □ **Error when certain sample elements are not listed or are not accurately represented in a sampling frame**
                - □ E.g. Highly educated respondents more likely to cooperate with mail surveys
            - ▪ Respondent error
                - □ Category of sample bias resulting from some respondent action or inaction
                - □ Non-response error
                    - ◆ To use results, the researcher must believe that consumers who responded to the questionnaire are representative of all consumers, including those who did not respond
                    - ◆ High in postal and phone surveys
                    - ◆ Response rates
                        - ◇ A low response rate will not generate the required data for analysis
                        - ◇ Count of the number of valid responses received in a data-gathering exercise
                        - ◇ Higher = better
                        - ◇ **Possible that non-respondents vary from the respondents in terms of their attitudes and experiences of the phenomenon being studied**
                    - ◆ Self-selection bias
                    - ◆ Non-respondents
                        - ◇ People who are not contacted or who refuse to cooperate
                    - ◆ Refusals
                        - ◇ People who are unwilling to participate in a research project
                    - ◆ No contacts
                        - ◇ People who are not at home or who are inaccessible on the first and second contact

- □ **Response error**
  - ◆ **When respondents either consciously or unconsciously tend to answer questions with a certain slant that misrepresents the truth**
  - ◆ Includes
    - ◇ Deliberate falsification
      - – Common issue with children respondents
    - ◇ Unconscious misrepresentation
      - – Arising from question format or content, even when respondent is trying to be truthful
    - ◇ **Response set**
      - – **Responding in a patterned way**
    - ◇ Acquiescence bias
      - – When the respondent agrees with everything the researcher says
    - ◇ Social desirability
      - – Desirable/politically correct rather than honest
    - ◇ Auspices (endorsement) bias
      - – Respondents being influenced by the organisation conducting study
    - ◇ Prestige bias
      - – Respondent is influenced in responding through their perceptions of the prestige of a group or individual
      - – E.g. Using words 'doctor', 'president', or 'excellence'
    - ◇ Extremity bias
      - – Occurs when some individuals tend to use extremes when responding to answers
    - ◇ Interviewer bias
      - – Occurs because the presence of the interviewer influences answers
  - ◆ Average-person hypothesis
    - ◇ Changes answers to conform to their perspective of what an average person looks like
  - ◆ Response bias can arise from the:
    - ◇ Question format
    - ◇ Content
    - ◇ Environment
    - ◇ Misunderstanding
  - ▪ Administrative error
    - □ Data processing
    - □ Sample selection
    - □ Interviewer error
    - □ Interviewer cheating
- ○ Errors may combine to yield a sample less than perfectly representative of the population
- ○
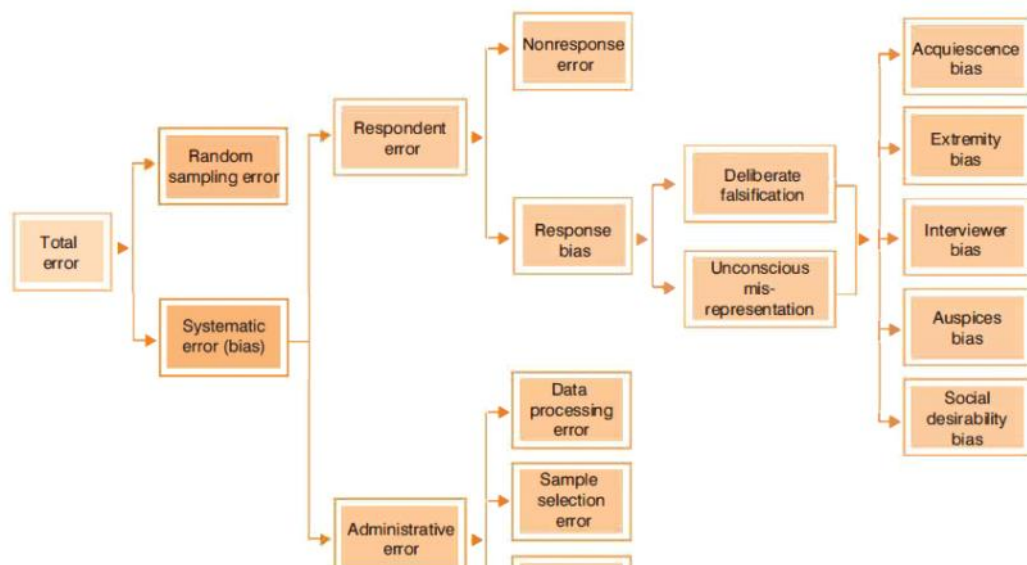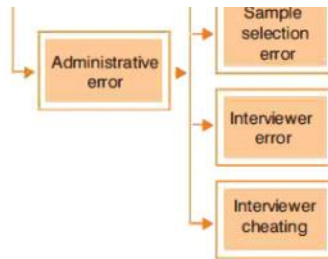
Response rate
- A count of the number of valid responses received to a data-gathering exercise
- High response rate is important to ensure the research is representative

Internet sampling
- Possible issues
    - People in some populations more likely to go online during the weekend than on a weekday
    - Researchers investigating college students' attitudes towards environmental issues found that those who responded to an email request that had been sent to all students tended to be more concerned about the environment
    - Website visitors self-select
        - Volunteer respondents who visit an organisation's website is a convenience sample
        - May not be representative because of self-selection bias
    - Lack of computer ownership and internet access among segments of the population and some regions
- Panel samples
    - Established consumer panel or pre-recruited membership panel
    - Yields a high response rate because panel members have already agreed to cooperate with the research organisation's email/internet surveys
    - Propensity-weighting scheme
        - Parallel studies to test the accuracy of its internet data-gathering capabilities
- Ad-hoc samples
    - Create a sampling frame of email addresses on an ad hoc basis
- Opt-in lists
    - Give permission to receive selected email, such as questionnaires, from a company with an internet presence

Qualitative sampling
- Sample for divergence
    - Sample people with different backgrounds, viewpoints, level of experience
    - Systematically look for outliers, different respondents
- Sample for convergence
    - Test initial results with new respondents
    - Stop sampling when no new insights are brought in by new respondents
- Also see Saturation point above

TRUE/FALSE

1. One of the main functions of qualitative data analysis is to develop as thick and rich and as complete an account of the phenomenon under investigation as possible.

    ANS: T   PTS: 1   DIF: Moderate   REF: Page 420

2. Qualitative research is situated within a positivist paradigm.

    ANS: F   PTS: 1   DIF: Moderate   REF: Page 420

3. Qualitative research is situated within a constructivist or interpretivist paradigm.

    ANS: T   PTS: 1   DIF: Moderate   REF: Page 420

4. In qualitative research, it is participants? subjective experiences and expressions of reality that the qualitative researcher tries to describe and understand in their work.

    ANS: T   PTS: 1   DIF: Moderate   REF: Page 420

5. There is an emphasis in qualitative research in signalling throughout the research process and the writing up of the research an acknowledgement of and a respect for the basic humanity of research participants and the circumstances of their lives.

    ANS: T   PTS: 1   DIF: Moderate   REF: Page 420

6. In quantitative research the researcher is completely written out of the analysis.

    ANS: T   PTS: 1   DIF: Moderate   REF: Page 420

7. In qualitative research the researcher is completely written out of the analysis.

    ANS: F   PTS: 1   DIF: Moderate   REF: Page 420

8. The fundamental aim of qualitative research is to uncover the subjective meanings participants make of the phenomenon under investigation. Within qualitative research, there is an acknowledgement of the role that the researcher plays in creating meaning, through their essential selection, description and interpretation of the data they gather for the research project.

    ANS: T   PTS: 1   DIF: Difficult   REF: Page 420

9. The essential role of the researcher in interpreting the experiences of others in the qualitative research process calls for the role of the researcher in this process and the perspective of the researcher, to be made explicit. This is done by the researcher through a reflexive process. Through this reflexive process the researcher writes themselves into the research process, and makes explicit their role in the research.

    ANS: T   PTS: 1   DIF: Difficult   REF: Page 420

18. The final stage in the four stages approach to data analysis is theorisation. In this stage, the researcher looks back at the theoretical framework outlined in the literature review chapter or section of the study. The researcher examines the literature review to see if and how the findings of their study fit with or contradict the findings of the studies and the theorists as they have presented them in their literature review. The researcher, in writing the data analysis stage of the research, demonstrates how their findings fit with, or contradict, the findings of other (published) research project. The researcher shows how, in the writing of the data analysis section or chapter of the research project, the research s/he is carrying out fits with the research published in the field or area. This is the process of theorisation. This is the way in which the researcher knits their research into the body of knowledge. This is the way in which the researcher makes a contribution to the body of knowledge.

ANS: T   PTS: 1   DIF: Difficult   REF: Page 422

19. In the four frameworks approach to the research process the third framework is the analytical framework.

ANS: F   PTS: 1   DIF: Easy   REF: Page 423

20. In the four frameworks approach to the research process the fourth and final framework is the analytical framework.

ANS: T   PTS: 1   DIF: Easy   REF: Page 423

21. The analytical framework is contained in the data analysis chapter of the thesis, or in the data analysis section of the report of the research. Data are analysed in the research project in relation to the research statement/question, the overall aim and the objectives of the research project. The focus of data analysis is on the research statement/question and the overall aim and objectives of the research. This ensures that the research project maintains focus, and it ensures that the researcher accomplishes what s/he set out to accomplish in undertaking the research as formally stated in the research aim and objectives.

ANS: T   PTS: 1   DIF: Difficult   REF: Page 424

22. Qualitative data analysis begins with a close reading of the data. In order to accomplish a close reading of the data, the researcher will read through the data over and over again. The researcher in the first place must become familiar with the data and then through the process of becoming familiar with the data, eventually they become immersed in the data. This close reading of the data brings the researcher deep into the nuances of the data. The researcher must know what is in the data and they must clearly understand the data before they can begin to describe and analyse the data.

ANS: T   PTS: 1   DIF: Moderate   REF: Page 424

23. In qualitative data analysis (as in quantitative data analysis), the researcher engages in coding the data.

ANS: T   PTS: 1   DIF: Moderate   REF: Page 424

24. In qualitative research, the codes used by the researcher are words or concepts which the researcher identifies in the data as relevant or even key or critical to the study.

ANS: T   PTS: 1   DIF: Moderate   REF: Page 424

25. In engaging in qualitative data analysis the researcher is above all concerned with the key concepts, the words or key phrases in the data. It is important to remember that concepts are the building blocks of theory. It is from the work of connecting concepts together that theories are developed, extended or changed.

ANS: T   PTS: 1   DIF: Difficult   REF: Page 424

MULTIPLE CHOICE

1. Qualitative researchers:
   a. Study one objective reality.
   b. Carry out objective research.
   c. Belief reality to be singular, objective and apart from consciousness.
   d. Rather than objectively studying the 慊eal? world, acknowledge multiple realities.

   ANS: D   PTS: 1   DIF: Moderate   REF: Page 420

2. Qualitative research is situated within a:
   a. Constructivist or interpretivist paradigm.   c. Feminist paradigm.
   b. Positivist paradigm.   d. Grounded theory paradigm.

   ANS: A   PTS: 1   DIF: Moderate   REF: Page 420

3. Language in qualitative research:
   a. Is in some respects a technicist instrumentalist language.
   b. Softer in a sense than the language of quantitative research and quantitative data analysis.
   c. Tends to include words like instrument, subject, experiment, and test.
   d. Uses words like instrument rather than method, and research subjects rather than research participants, and words like experiment or test rather than words like explore, describe, detail, construct.

   ANS: B   PTS: 1   DIF: Difficult   REF: Page 420

4. The fundamental aim of qualitative research:
   a. Is to test hypotheses.
   b. Is to carry out experiments.
   c. Is to uncover the subjective meanings participants make of the phenomenon under investigation
   d. Is to engage in statistical analyses.

   ANS: C   PTS: 1   DIF: Easy   REF: Page 420

5. Within qualitative research,
   a. The researcher is present and visible.   c. The researcher is invisible.
   b. The researcher is written out.   d. The researcher is not present.

   ANS: A   PTS: 1   DIF: Moderate   REF: Page 420

6. Within qualitative research:
   a. There is no acknowledgement of the role that the researcher plays in creating meaning, through their essential selection, description and interpretation of the data they gather for the research project.
   b. There is an acknowledgement of the role that the researcher plays in creating meaning, through their essential selection, description and interpretation of the data they gather for the research project:
   c. The researcher has no role in making meaning. Meaning is apart from the researcher.
   d. The researcher has little role in making meaning.

   ANS: B   PTS: 1   DIF: Difficult   REF: Page 420

7. In qualitative data analysis the researcher:
   a. Is objective.
   b. Stands apart from the data.
   c. Is objective and apart from the data.
   d. Becomes subjectively immersed in the data

   ANS: D   PTS: 1   DIF: Difficult   REF: Page 420

8. Reflexivity calls for an acknowledgement on the part of the researcher. :
   a. Of the financial cost of the research.
   b. Of the responses of participants to the research.
   c. Of their role in the research project.
   d. Of the ethical issues in the research.

   ANS: C   PTS: 1   DIF: Difficult   REF: Page 420

9. Through the reflexive process:
   a. The researcher outlines the project捆 research methodology.
   b. The researcher outlines the project捆 research methodology.
   c. The researcher details the analytical framework.
   d. The researcher writes themselves into the research process, and makes explicit their role in the research.

   ANS: D   PTS: 1   DIF: Moderate

10. In qualitative data analysis:
    a. Rather than analysing numbers, researchers analyse language and they use language to give expression to their analyses
    b. Researchers engage in analysing descriptive statistics.
    c. Researchers engage in analysing inferential statistics.
    d. Researchers engage in analysing numeric data.

    ANS: A   PTS: 1   DIF: Easy   REF: Page 421

11. Many of the data collection methods used in qualitative research:
    a. Are designed to generate large quantitative data sets.
    b. Are highly structured and designed to be objective.
    c. Produce data that is language based, interview and focus group transcripts of the oral testimony of participants, written texts and documents.
    d. Are designed to generate data that can be analysed using inferential statistics.

    ANS: C   PTS: 1   DIF: Moderate   REF: Page 421

12. The key to selecting or developing an appropriate approach to qualitative data analysis:
    a. Is to work with an approach with which you are familiar.
    b. Is to work with an approach with which you would like to become familiar.
    c. Is to work with an approach with which the research supervisor is familiar.
    d. Is to select or develop an approach which best suits the research project, an approach which best fits the research project.

    ANS: D   PTS: 1   DIF: Easy   REF: Page 421

13. The four stages of data analysis are:
    a. Conceptual, theoretical, methodological, analytical.
    b. Description, interpretation, conclusions and theorisation.
    c. Literature, methodology, data gathering, data analysis.
    d. Test, re-test, post-test, re-test.

    ANS: B   PTS: 1   DIF: Easy   REF: Page 422

14. The analytical framework is the:
    a. First framework in the four frameworks approach to the research project.
    b. Second framework in the four frameworks approach to the research project.
    c. Third framework in the four frameworks approach to the research project.
    d. Fourth framework in the four frameworks approach to the research project.

    ANS: D   PTS: 1   DIF: Easy   REF: Page 423

15. If the methodology used in the research is phenomenology:
    a. Then the data analysis process will be phenomenological.
    b. Then the data analysis process will be a grounded theory approach to data analysis.
    c. Then the data analysis process will be the analysis of discourses.
    d. Then the data analysis process will be a semiotic approach to data analysis.

    ANS: A   PTS: 1   DIF: Easy   REF: Page 423

16. If the methodology used in the research is discourse analysis:
    a. Then the data analysis process will be phenomenological.
    b. Then the data analysis process will be a grounded theory approach to data analysis.
    c. Then the data analysis process will be the analysis of discourses.
    d. Then the data analysis process will be a semiotic approach to data analysis.

    ANS: C   PTS: 1   DIF: Easy   REF: Page 423

17. If the methodology used in the research is narrative analysis:
    a. Then the data analysis process will be phenomenological.
    b. Then the data analysis process will be a grounded theory approach to data analysis.
    c. Then the data analysis process will be the analysis of discourses.
    d. Then the data analysis process will be the analysis of narratives.

    ANS: D   PTS: 1   DIF: Easy   REF: Page 423

18. If the methodology used in the research is grounded theory:
    a. Then the data analysis process will be phenomenological.
    b. Then the data analysis process will be a grounded theory approach to data analysis.
    c. Then the data analysis process will be the analysis of discourses.
    d. Then the data analysis process will be a semiotic approach to data analysis.

    ANS: B   PTS: 1   DIF: Easy   REF: Page 423

24. In mixed methods research:
   a. Different data gathering methods are used in the research project.
   b. Both descriptive statistics and inferential statistics are used.
   c. The data gathering methods used are mixed.
   d. Both quantitative and qualitative approaches were used in the research project

   ANS: D   PTS: 1   DIF: Moderate   REF: Page 433

25. Atlas ti and NVivo are both:
   a. Computer software packages designed for the analysis of qualitative data.
   b. Computer software packages designed for the analysis of quantitative data.
   c. Computer software packages designed for statistical analysis.
   d. Computer software packages designed for use in project management.

   ANS: A   PTS: 1   DIF: Easy   REF: Page 436

SHORT ANSWER

1. Give some examples of how language is used differently in quantitative and qualitative research.

   ANS:
   Language is used differently in quantitative and qualitative research. For example, in qualitative research, rather than instrument, the word used is method. Rather than research subjects, qualitative researchers tend to talk about research participants. Rather than experiment or test, qualitative researchers tend to explore, describe, detail and construct.

   PTS: 1

2. Define reflexivity.

   ANS:
   Reflexivity in qualitative research is the account that the researcher provides of themselves and their role in the construction of meaning in the research process. The essential role of the researcher in interpreting the experiences of others in the qualitative research process calls for the perspective of the researcher in this process to be made explicit. This is done by the researcher through a reflexive process in which the researcher makes explicit the perspectives, understandings and decisions that guide them through the process of data analysis to the findings and conclusions of the research.

   PTS: 1

3. What is meant by the term 慮hick description?

   ANS:
   Thick description was a concept developed by Clifford Geertz (1973), in relation to ethnography. The concept is used in the social sciences to explain the complex in-depth representation qualitative researchers attempt to accomplish when describing in their research projects the phenomena they investigate in their research.

   PTS: 1