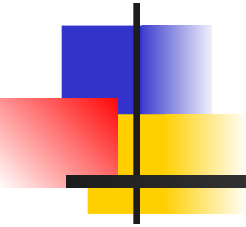


# Research Instruments



Making Selection



# Measurement Instruments

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- Types of instruments
  - Cognitive - measuring intellectual processes such as thinking, memorizing, problem solving, analyzing, or reasoning
  - Achievement - measuring what students already know
  - Aptitude - measuring general mental ability, usually for predicting future performance



# Measurement Instruments

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- Types of instruments (continued)
  - Affective – assessing individuals’ feelings, values, attitudes, beliefs, etc.
    - Typical affective characteristics of interest
      - Values – deeply held beliefs about ideas, persons, or objects
      - Attitudes – dispositions that are favorable or unfavorable toward things
      - Interests – inclinations to seek out or participate in particular activities, objects, ideas, etc.
      - Personality – characteristics that represent a person’s typical behaviors



# Measurement Instruments

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- Types of instruments (continued)
  - Affective (continued)
    - Scales used for responding to items on affective tests
      - Likert
        - Positive or negative statements to which subjects respond on scales such as strongly disagree, disagree, neutral, agree, or strongly agree
      - Semantic differential
        - Bipolar adjectives (i.e., two opposite adjectives) with a scale between each adjective
        - Dislike: \_\_\_ \_\_\_ \_\_\_ \_\_\_ \_\_\_ :Like
    - Rating scales - rankings based on how a subject would rate the trait of interest



# Measurement Instruments

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- Issues for cognitive, aptitude, or affective tests
  - Problems inherent in the use of self-report measures
    - Bias – distortions of a respondent's performance or responses based on ethnicity, race, gender, language, etc.
    - Responses to affective test items
      - Socially acceptable responses
      - Accuracy of responses
      - Response sets
  - Alternatives include the use of projective tests

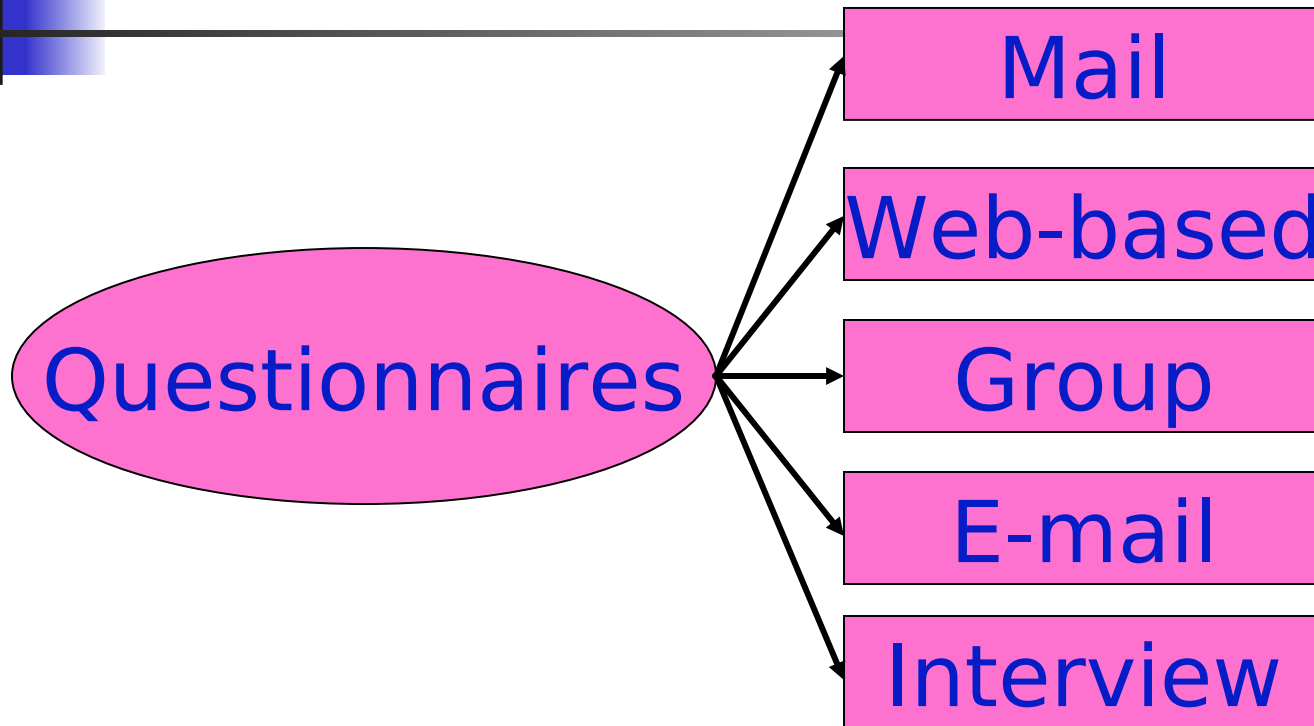


# Classification of research Instruments

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- **Researcher-completed Instruments** :Rating scales, Interview schedules/guides, Self-checklists Tally sheets, Flowcharts/Performance checklists,Time-and-motion logs, Observation forms
  
- **Subject-completed Instruments** :Attitude scales ,Personality inventories, Achievement/aptitude tests, Projective devices, Socio-metric devices, Questionnaires

# Conducting A Questionnaire Survey



# Questionnaire - Advantages


- **Broad coverage (local, national, international)**
- **Frank and anonymous answers**
- **Economical for large population**
- **Less Time consuming**
- **Quantitative data (easy to analyze)**
- **Filling at a convenient time**
- **Easy to respond (fixed responses)**
- **Good for sensitive & ego-related Questions.**
- **Original hard-to-obtain data**



# Questionnaire - Disadvantages

- **No clarification for ambiguous questions**
- **Inadequate motivation to respond**
- **Poorly worded or direct questions**
- **Unattractive style and format**
- **Low response rate**
- **Inaccurate responses - no verification**
- **Limited fixed responses**
- **Cannot uncover causes or relationships for attitudes, beliefs, actions**

# Type of Questions

- 
- **Factual:** Age, gender, education, experience  
(often used to investigate relationship)
  - **Informative:** What respondents know about a given topic (How do you come to know about the availability of e-journals?)
  - **Attitudinal/Opinion:** To obtain info about respondents' beliefs, feelings, values (Do you agree that current copyright law is fair?)
  - **Self-perception:** Allows subjects to compare their ideas or actions with others (How active are you in the community work? How will you describe your computing skills?)

# Type of Questions

- **Standard of Action:** How respondents will act in a situation (For which party you will vote in the next election? Will you join the organ donation society? )
- **Projective Questions:** Allow respondents to answer in an indirect manner by imposing their feelings, attitudes or beliefs on others (Are most of the Singaporeans quitters or stayers? Are students happy with the grading scheme?)

# Structured/Unstructured Qs

Another possible categorization of questions:

**Unstructured Questions: Allow** respondents to reply freely without having to select one of several provided responses (also called open-ended questions)

- **Useful for exploratory studies in which various dimensions and facets of a problem are examined**
- **Usually difficult to analyze responses**
  - **What steps are required to improve the quality of National Service?**
- **Usually low response rate**

# Structured Questions

Provide a group of fixed responses

**Dichotomous:** yes/no, true/false, agree/disagree

- **Multiple Choice:** What sources do you use for writing term reports? (check all that apply)
  - How many hours do you exercise per week (check only one response)
  - How satisfied are you with the quality of canteen 'A' food?
- **Contingency:** Determine if the respondent is qualified to answer a subsequent question)
  - Do you use databases available through iGems? (If no, please move to question 15) \*
  - Have you participated in DIS orientation? (Yes/No)  
If yes, how effective was this briefing? (Very effective, effective, ineffective ...)

# Scaling Responses



**Likert-type Scale:** Each response is assigned a numeric ranking based on a continuum that contains predetermined units of measurement

- Designed to show a differentiation among respondents opinions
  - How important is .... (very important, important ....)
  - How adequate are .... (v. adequate .....inadequate)
  - How frequently do you ... (frequently ... infrequently)



# Scaling Responses

## Rank-order or Comparative Ranking Scale

- Respondents are expected to rank responses according to their importance/ preference
- Should be used carefully as many respondents face difficulty in understanding/responding
- Only use a short list of responses

**Q.** What sources do you prefer for writing term reports?  
Please rank them according to ..... (1= most preferred;  
7= least preferred)

- Books
- Encyclopaedia
- Friends
- Internet
- Journals
- Lecture notes
- Personal collection



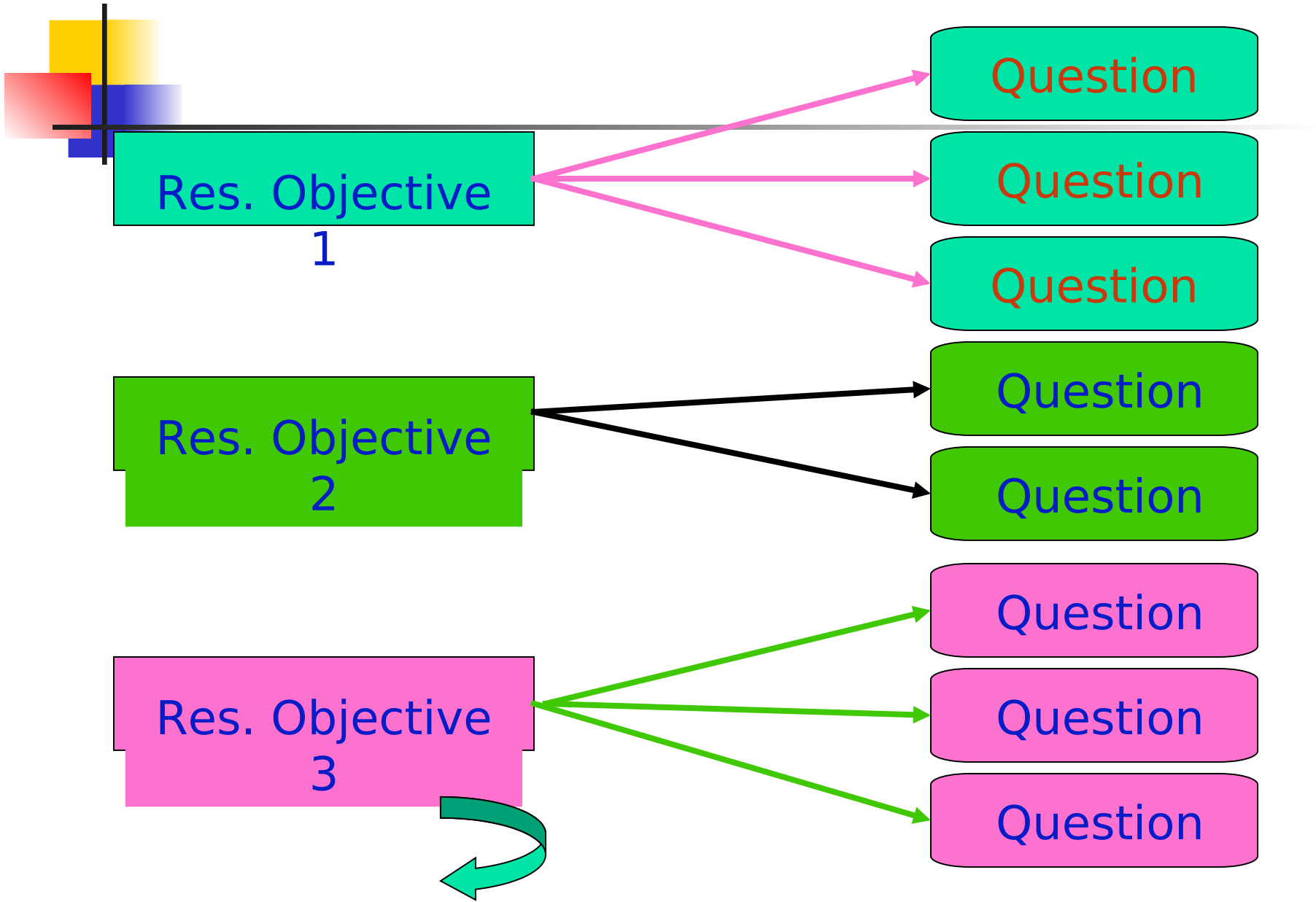
# Question Placement



**Opening questions** - start with easy non threatening questions

- **Sequence** - according to the research topic, logical flow
- **Sensitive questions** - should be asked only after trust is developed
- **Difficult questions** - more difficult questions should be asked at the end
- **Personal Data** - age, gender, qualification, experience

# Mapping Survey Questions





# Designing the Instrument

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- • Leave plenty of space to write for questions in which people write in answers
- • Allow as much white space as possible
- • Include only questions that are really needed



# Clearly Worded

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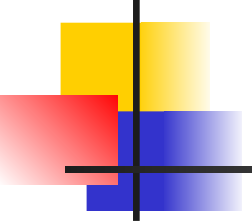
- The Prospectus is valuable source of information.
- Strongly Agree
- Agree
- Undecided
- Disagree
- Strongly Disagree

# Avoid “and” questions



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- - Example: Whether the classrooms are ventilated and clean?

- 
- 
- Have answers that are mutually exclusive
  - What is your age?
  - 20-30
  - 30-40
  - 40-50
  - Over 50

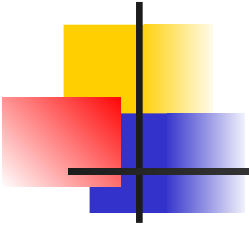


# Using Words

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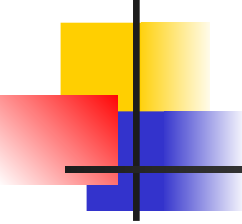
- Don't use words that could influence the response.

Example: Do you feel that the private schools are better equipped than the governments schools



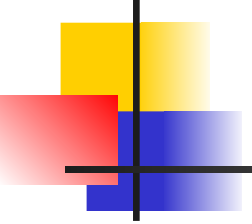
- 
- Avoid using jargon, acronyms and words
  - The ICDS programme has improved nutrition of the children
  - ICT inputs have made learning better.



- 
- 
- Allow a response for “I don’t know”, “other”, “not applicable” or “no opinion”

Which Internet browser do you prefer?

- Microsoft Explorer
- Netscape Communicator
- Mozilla
- Other (please list: \_\_\_\_\_)

- 
- 
- In measuring attitudes, use both
  - positive and negative statements.
  
  - - Smart Boards have increased student learning.
  - - Smart Board cost too much for the benefits gained.