

**AC52012**

Research Methods

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# **Methods for Collecting Data from Participants**

# Plan



- Asking questions
- Qualitative/quantitative
- Listening to answers
- Methods:
  - Observation
  - Structured Diary
  - Survey/questionnaire
  - Interview
  - Focus Group

# Types of Question



- General
  - Demographic
  - Experience with computers
- Open-Ended
  - E.g. Can you suggest any improvements to the interface?
  - Considered supplementary
- Closed (pre-categorised)
  - Scalar
  - Multi-choice
  - Ranked

# Developing Questions



- Avoid Universal Questions
  - E.g. "Did you find the system easy to use?"
- Ask people to comment on a piece of software they like and find easy to use
  - What makes it easy to use?
- Convert answers into questions for your questionnaire
  - E.g. "It's easy to undo mistakes"
  - Becomes: "The system makes it easy for me to undo mistakes".
  - Then measure users level of agreement with the statement

## Questionnaires

# Categorising responses - 1

- Binary response:

*Have you used this system before?*

*YES/NO*

- Simple checklist:

*Can you use the following text editing commands?*

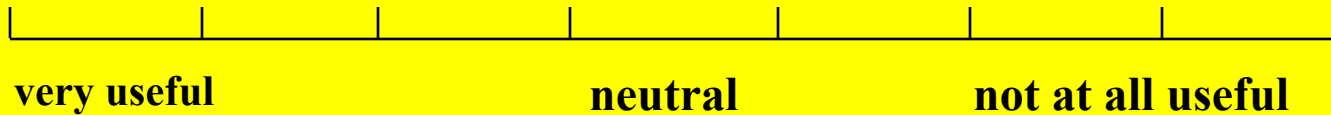
	YES	NO	DON'T KNOW
COPY	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
PASTE	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

## Questionnaires

# Categorising responses - 2

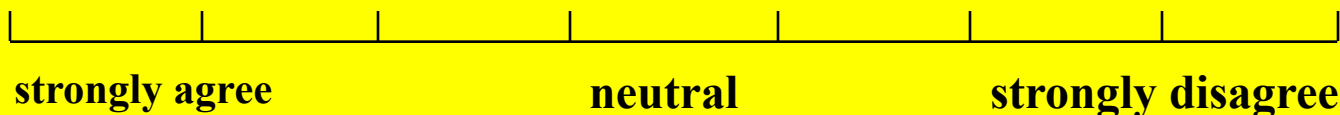
- Multi-point rating scale:

Rate the usefulness of the COPY command on the following scale:  
(Please tick one point)



- A variant, called a **Likert scale**, asks for strength of agreement with a statement:

All University teaching should be done using CBL techniques  
(Please tick one point)



## Categorising responses - 3

- Semantic differential scale:

[illegible]

## Questionnaires

# Categorising responses - 4



- Ranked order

**Please rank the following features in order of importance to YOU**  
*(1 indicates most important, 4 is least)*

GROUP ☐ COPY ☐ INSERT ☐ PASTE ☐



## Questionnaires

# Categorising responses - 5

- Multiple choice:

**What was the main reason you chose to purchase this system (*Please tick one answer*)?**

Price

☐

Performance

☐

Fits my image

☐

Like the colour

☐

Other (please specify)

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# Asking the wrong questions - 1



- The double question ...

*"Do you normally walk to lectures or do you carry your lunch"*

- The wrong choice question ...

*"Is your hair pink, purple or green?"*

# Asking the wrong questions - 2



- The kitchen sink question ...

*"Please list all the computers you have used in the last five years, what you used them for and why you changed, elaborating wherever possible with additional relevant detail"*

# Asking the wrong questions - 3



- The fuzzy word question ...

*"Do you frequently have problems using the system?"*

- The universal question ...

*"What do you think of the manuals?"*

# Asking the wrong questions - 4



- The jargon question ...

*"Do you feel that the interface specification as actualised meets with your functionally derived requirements?"*

- Leading questions ...

*"Why are you happy using this machine?"*

# Qualitative and Quantitative Data

- Quantitative

- consists of information represented in the form of numbers which represent the results of a measurement process applied to the variables in an investigation.
- to provide data in a consistent way
- to enable comparison of performance
- statistical analysis

- Qualitative

- consists of verbal/written descriptions of behaviour and experience resulting from processes of observation, interpretation and analysis
- to get at what's really going on between user and machine

# Two kinds of evaluation ...




## Formative evaluation

- Highly specific
- To help change
- Goes on throughout development
- Monitoring
- Identifying

## Summative evaluation

- General
- To record
- Done on completion of stages
- Summarising
- Describing

# 1. Observation

- 
- Watch users at work
    - List of things to watch for
    - Be ready to record unexpected things
  - Variation
    - Ask questions
  - Interaction of environment with tasks



# Observation: Strengths

- Unobtrusive
- Can be done in “real life” setting
- Extraneous factors
  - environment
  - interruptions
  - workplace atmosphere
  - other systems in use
  - distractions
  - management style

# Observation: Limitations



- Can't measure ...
  - intention
  - feelings
  - satisfaction
- Can record **what's** happening but not **why**

## 2. Structured diary



- User keeps a diary, recording ...
  - When they got stuck
  - What the problem was
  - Why they got stuck
  - How they recovered
  - Suggestions
- Photo diary?

# Structured diary: Strengths



- Uncovers long term usage problems
- Can be highly specific
- Inexpensive

# Structured diary: Limitations

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- Getting users to complete them
- Training may be needed

# Surveys / Questionnaires



- Identify what you want to find out
- Who has the information?
- Select representative sample
- Formulate introduction & questions
- Pilot Test
- Collect data
- Analyse

# Questionnaire Administration



- Individual
  - Researcher Present
- Groups
  - Researcher(s) Present
- Mail
  - Stamped Addressed Envelope Required
- Web
  - Can save money
- Phone
  - Quick feedback from many respondents

# Analysis



- Responses converted to numerical values
- Entered into Statistics Package (SPSS)
- Descriptive Statistics (means, modes)
- Inferential Statistics (t-tests, ANOVA)
  
- Free text – grounded theory



# Questionnaires: Strengths



- Can ask direct questions
- Not labour intensive
- Gathering “coarse” data from large numbers
- Responses pre-categorised
- Can be statistically analysed
- Quick to analyse

# Questionnaires: Limitations



- Easy to ask wrong or bad questions
- Data is “coarse”
- No interaction
- Bias introduced by low response



# Interviews

# **Interviewing - semi-structured**



- Identify what you want to find out
- Who has the information?
- Select representative sample
- Formulate open-ended questions
- A set of probes (echo or extension)
- Pilot test
- Collect Data
- Analyse Data

# Preparing the Interview



- Defining the Questions
  - Must have a clear, well defined purpose
  - Brief and to the point
  - Avoid ambiguity
- Sequencing the questions
  - Distinct beginning, middle and end
  - Start with “warm-up” questions

# During the interview



- Be neutral (don't agree or disagree)
- Facilitate the conversation
  - Look interested (eye contact helps)
  - Echo
  - Extension
- Don't inhibit the conversation
  - Don't state own opinion
  - Don't disapprove of the interviewees opinion
  - Don't draw conclusions
  - Don't ask leading questions
  - Don't dominate the conversation

# Data Recording



- Confidentiality
- Take Notes
  - Difficult to take notes and conduct interview
- Record
  - Some people may not want to be recorded
- Pre-coded
  - Difficult to remember codes
  - What if info given where no codes exist?
- Post interview summary

# Data Analysis



- Transcribe recording and notes for analysis
- Code transcripts for quantitative analysis
- Qualitative Data
  - Provides good anecdotes and quotes for usability report
- Quantitative Data
  - Categorised qualitative data
  - Provides statistics for usability report



## **Interviewing - semi-structured:**

# **Strengths**



- High quality data
- Can ask direct questions
- Can probe further
- Flexible
- Interactive ...
  - clarification on both sides
- “Hidden agendas”

## **Interviewing - semi-structured**

# **Limitations**



- Expensive to do
- Time consuming
- Highly skilled
- Interviewer Effects
- Standardisation between interviewers
- Response bias

# Focus Groups



- Typically 6 –9 users discuss new concepts and identify issues for about 2 hours
- Session run by a moderator who keeps focus
- Relatively informal technique
- Assesses user needs and feelings
- Can be utilised before interface designed and/or after it has been in use for some time

## **Focus Groups:**

# **Procedure**



- Preparation:
  - Prepare a list of issues to be discussed
  - Determine the kind of info to gather
  - Gather users
- During Session:
  - Moderator keeps the discussion on track without inhibiting the free flow of ideas
  - Make sure all members contribute
- Analysis:
  - Moderator writes report detailing the events

# Focus Groups



- Strengths
  - Informal technique
  - Peer to Peer situation
  - Generates spontaneous ideas
- Limitations
  - Demanding in terms of number of users
  - Many Focus Groups Required
  - Users may think they want one thing when they in fact need another

# Ecological validity



- The ecological validity of any observation made in a laboratory situation is the extent to which the result can be generalised to a real world situation
- The difference between the lab situation and the real world situation is the Ecological Gap

# Ecological validity (2):

## Two questions



- *"What have we left out from the lab situation which would be present in the real world?"*
- *"What have we added in the lab which would not be present in the real world?"*

# Qualitative Methods...

	Observation	Diaries	Interview	Focus Group	Questionnaire
<b>Stage</b>	Formative	Formative	Formative/ Summative	Usually Formative	Formative/ Summative
<b>Style</b>	Field	Field	Lab/Field	Lab/Field	Lab/Field
<b>Objective</b>	No	No	No	No	Yes
<b>Measure</b>	Qualitative	Qualitative	Qual/Quan	Qualitative	Qual/Quan
<b>Immediacy</b>	Yes	No	No	Yes/No	No
<b>Intrusive?</b>	Both	Slightly	No	Yes	No
<b>Time</b>	High	Medium	Low	High	Low
<b>Equipment</b>	Low	Low	Low	Low	Low
<b>Expertise</b>	High	Low	High	High	Low