AC52012
Research Methods

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			
PASTE			

Categorising responses - 2

- Multi-point rating scale:

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

very useful **neutral** **not at all useful**

- 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)

strongly agree **neutral** **strongly disagree**

Questionnaires

Categorising responses - 3

- Semantic differential scale:

Rate the new interface on the following dimensions:

	extremely	quite	slightly	neutral	slightly	quite	extremely	
predictable								haphazard
easy								difficult
simple								complicated
confusing								clear
fast								slow

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 ☐

Categorising responses - 5

- Multiple choice:

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

Price ☐

Performance ☐

Fits my image ☐

Like the colour ☐

Other (please specify) _____

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

- 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
Stage	Formative	Formative	Formative/ Summative	Usually Formative	Formative/ Summative
Style	Field	Field	Lab/Field	Lab/Field	Lab/Field
Objective	No	No	No	No	Yes
Measure	Qualitative	Qualitative	Qual/Quan	Qualitative	Qual/Quan
Immediacy	Yes	No	No	Yes/No	No
Intrusive?	Both	Slightly	No	Yes	No
Time	High	Medium	Low	High	Low
Equipment	Low	Low	Low	Low	Low
Expertise	High	Low	High	High	Low