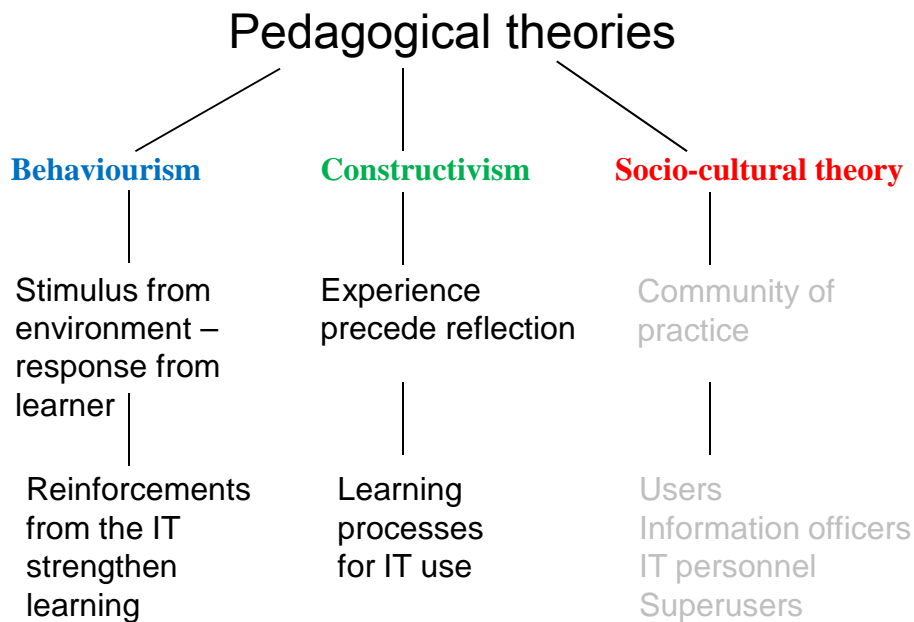


User interface for learning

- Aim:
 - Design for and evaluate learnability
 - Writing inline help
 - Basis for Assignment 5
- Core literature
 - Chapter 9
- Additional literature
 - Grossman et.al. (2009) A Survey of Software Learnability: Metrics, Methodologies and Guidelines
 - Furnas et.al. (1987) The vocabulary problem in human-system communication

1



2



Behaviourism – 1920

- Observable behaviour
 - No concern for thinking
- The learning cycle
 - Stimulus from the environment
 - Login:
 - Password:
 - Response from the learner
 - Writing user name and password
 - If this response differed from previous ones and the new response is repeated, learning has occurred
 - Reinforcement from the environment
 - Other windows appear

Behaviourism

3

Reinforcement and learning

Reinforcement strengthens learning

A wanted event or the removal of an unwanted one

- Wanted
 - Output which we wanted
- Removal of unwanted
 - No more error messages
- Informative reinforcement
 - You are now logged in**
- Immediate reinforcement
 - < 1 second
- Repeated reinforcement at variable ratio or interval

Punishment weakens learning

Unwanted event or removal of a wanted one

- ```
> prnt rapport.text
 ILLEGAL USER ACTION!
 PRINTER DAMAGED!
```
- Extinction
    - No new stimulus from the environment
- ```
> cd MyFiles
>
```

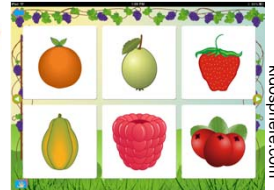
Behaviourism

4



Design for learnability

When simple things need instruction, it is a certain sign of poor design



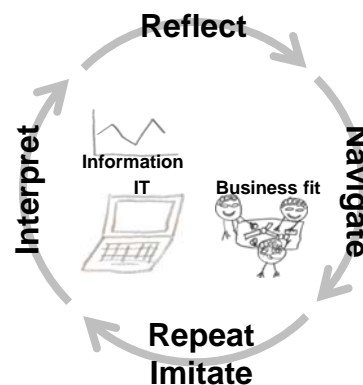
- Some computer applications are complex
 - Additional help needed



5

Inline help in the program

- Responding to the the users' current problem
 - Guidance
 - Not a tutorial primarily designed for teaching
- Minimal distraction from task
 - Recognizable language
 - Recognizable graphics
 - Choice of contents
- For which learning process?



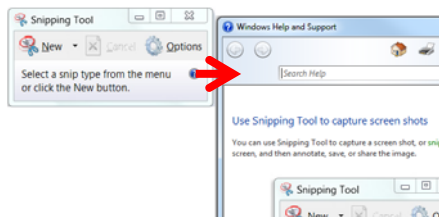
6



Help – How

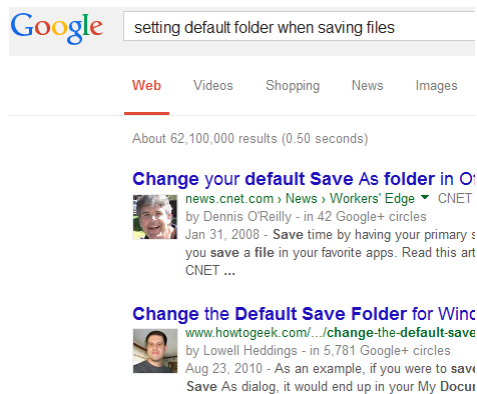
Inline – Context-sensitive

- Tooltip
 - Wizard
 - Help button
 - System-initiated
- Help where you are

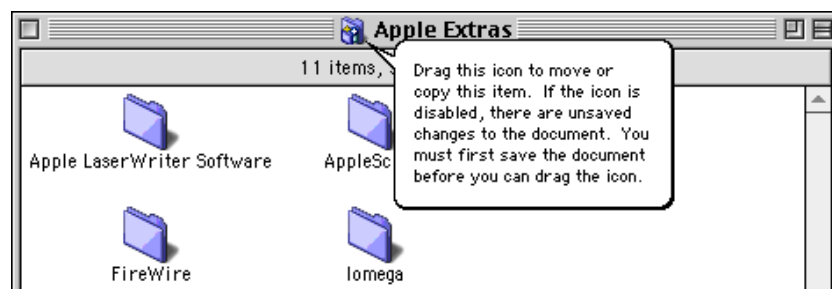


Context-free

- Help system
 - Web
- Search if you don't know where to be



Balloon help

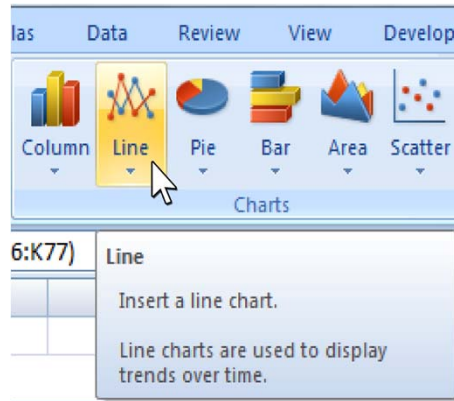
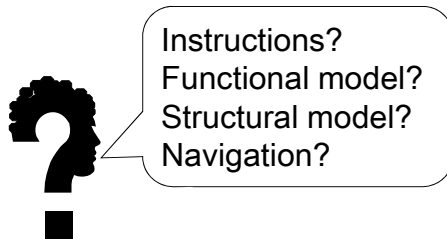


- Appeared immediately on mouseover
- Cluttered the screen



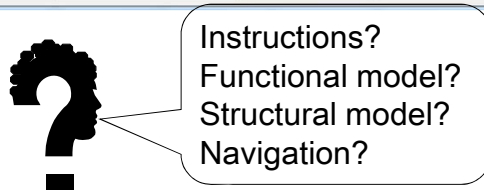
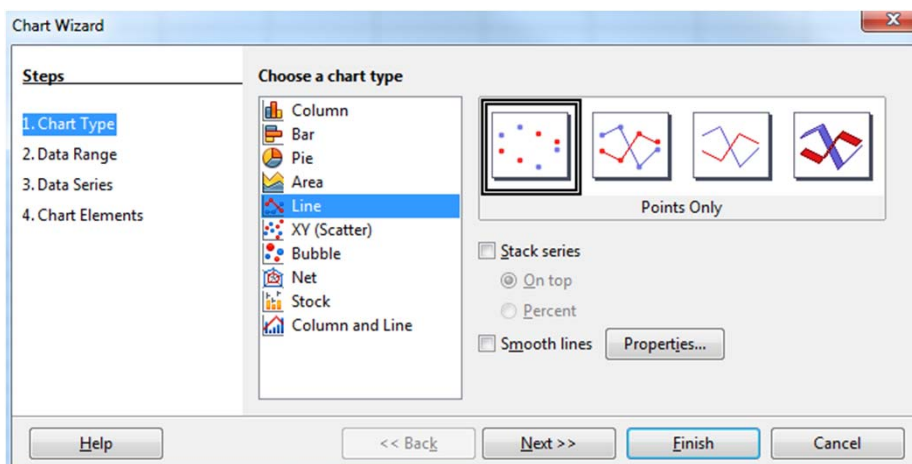
Tooltip – Screenshot

- Help where the user is at the moment
- No need for search
 - 1 s delay
 - Avoiding distraction



9

Wizards carrying out the operations



10



Help button → Document

The screenshot shows the DHIS2 interface for Sierra Leone. On the left is a tree view of the organization structure. The main area displays the 'Data Entry' form with fields for Organisation Unit (Sierra Leone), Data Set, and Period. A help window titled 'Data entry with DHIS 2' is open, containing instructions on how to use the data entry module. A speech bubble from a question mark icon asks: 'Instructions? Functional model? Structural model? Navigation?'.

Data Entry

Organisation Unit: Sierra Leone
 Data Set: [Select data set]
 Period: [Select period]

Data entry with DHIS 2

To open the data entry window click on the services tab displayed in the main menu. A drop down menu will appear listing the services provided by DHIS 2. Click on the Data Entry option.

The data entry module is where data is manually registered in the DHIS 2 database. Data is registered for an organisation unit, a period, and a set of data elements (data set) at a time. A data set often corresponds to a paper-based data collection tool.

Selecting the data entry form

To start entering data the first step is to open the correct form. Follow these steps:

1. Locate the orgunit you want to register data for in the tree menu to the left. Expand and close branches by clicking on the '+' symbols. A quick way to find an orgunit is to use the search box just above the tree (the green symbol), but you need to write in the full name to get a match.

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System initiated – Clippy

The illustration shows the Clippy character in various scenarios:

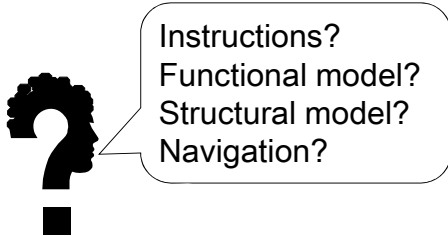
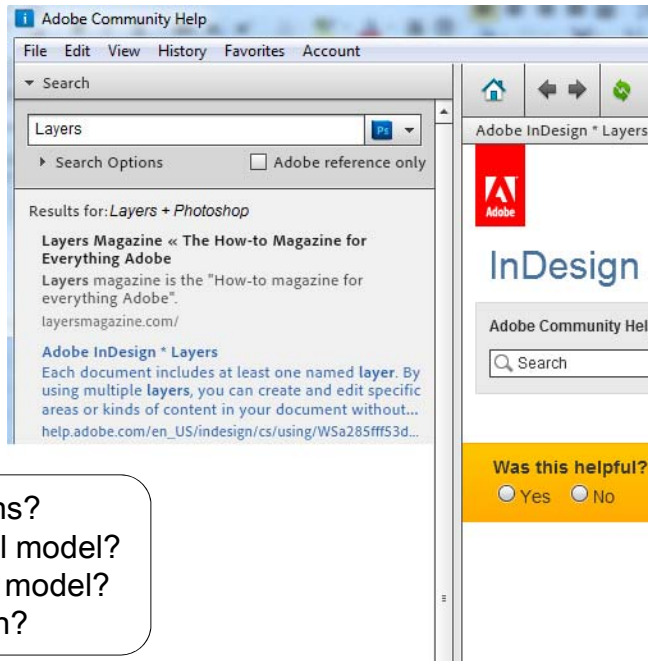
- Message: "It looks like you're writing a letter. Would you like help?"
 - Get help with writing the letter
 - Just type the letter without help
 - Don't show me this tip again
- Message: "Hi! I am Clippy, your office assistant. Would you like some assistance today?"
 - Yes
 - No
- Message: "Looks like you're trying to get rid of me. Would you like some help with that?"
- Message: "Your computer seems to be turned on."

12



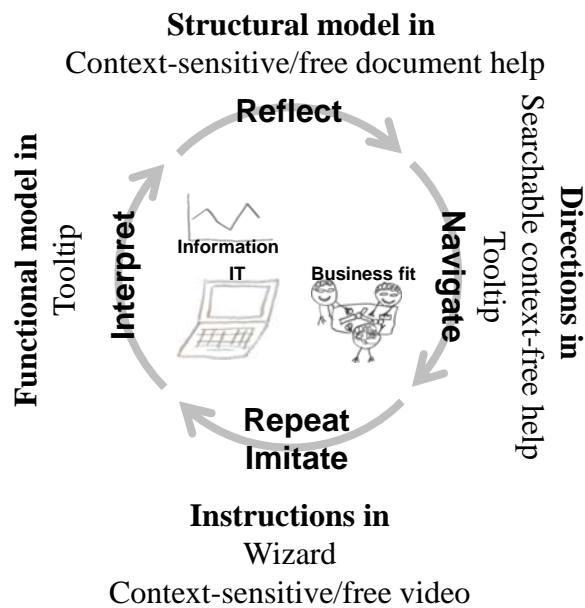
Help system

1. Click Help in the application
2. Wait for the help system to start
3. Select software
4. Search
5. Select hit



13

Targeting learning in help functionality



14



Qualities of IT applications

- Learnability
 - From novice to expert user
 - Time from first encounter to use
 - Time before understanding what the application can be used for
 - Time before understanding how the representation of the domain enables and restricts operations
 - Intermittent users
 - Time to recall **Trouble shooting**
- Usability
 - Efficiency
 - Time and effort used to achieve the result
 - Satisfaction
 - Comfort and acceptability amongst users
- Usefulness
 - Effectiveness
 - The quality of the result achieved

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Learnability evaluation

	Software	Help functionality
Heuristic evaluation	Specialists checking software	Specialists checking help functions
Question-suggestion	Software tasks	Help tasks
Measuring learning	Software tasks	Help tasks

- Help functionality
 - Information: understandability of the help contents
 - IT: way of accessing the help
 - Business fit: does the help fix the problem

16



Heuristic evaluation – software and help

- 2 - 3 usability specialists
- Inspect every detail of the application
- Compare to known guidelines (heuristics)
 - Each guideline broken
 - a possible problem of learning is noted
- Cheap, first evaluation

	Software	Help
Guidelines (heuristics):	Rogers, Sharp, Preece (2007) Interaction Design: Beyond Human - Computer Interaction	Chapter 9. Furnas et.al (1987)

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Question-suggestion – software (incl. Help)

- Small number of test persons, stop when no news
 - Right selection of users?
- Design tasks to perform

Question-suggestion Protocol Instructions to Participant:

1. Ask relatively specific, procedural questions.
 2. Try to answer your own questions first,
 - Software only: but do not engage in extensive problem solving.
 - Help: [Look for help if needed](#)
 3. Focus on getting the task done, as you would in the real world.
- Video-recording, time taking, notes
 - Possible interview before and after the session
 - Analysis of the users' understanding, misunderstandings and mistakes
 - Consumes more time than heuristic evaluation
 - For systems to be extensively used

18



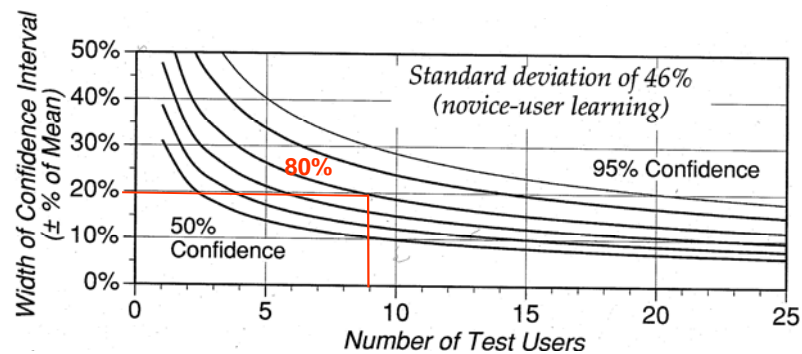
Measuring skills learning – software incl. help

- Design tasks to perform
- Representative selection of users
- Way of measuring
 - Time taking
 - Counting keystrokes
 - Counting errors
 - Scaled response to questionnaires



19

Number of test users for measuring time for learning for novices
The number increases with standard deviation



80% confidence level

20% confidence interval → 9 users

Example

Mean 5 minutes

80% surety that the real mean lies within the 4 – 6 minutes interval

Jakob Nielsen (1993) Usability Engineering. AP Professional, Boston

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