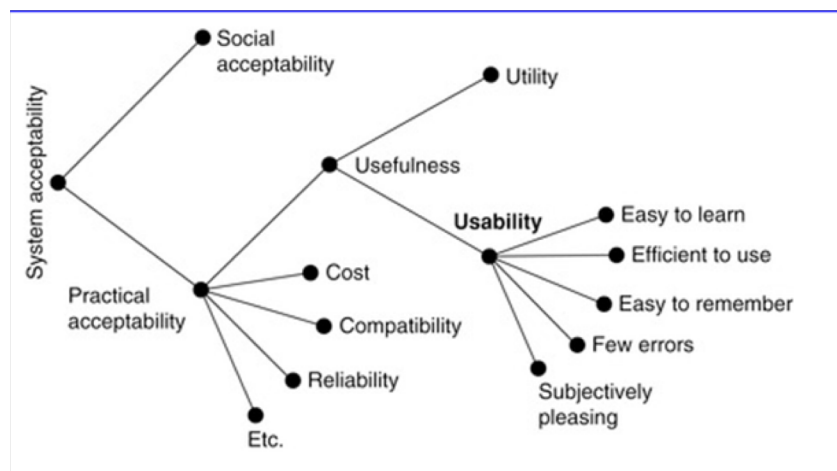


User interface for learning

- Aim:
 - Design for and evaluate learnability
 - Writing inline help
 - Basis for Assignment 5
- Core literature
 - Chapter 6
- 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
 - Laue (2017) Anti-Patterns in End-User Documentation
 - Purchase and Worrill (2002) An empirical study of on-line help design: features and principles

1

A model of the attributes of system acceptability



Nielsen (1993) Usability Engineering

2



HCI Heuristics – Guidelines for design and evaluation

1. Visibility of system status
2. Match between system and the real world
3. User control and freedom
4. Consistency and standards
5. Error prevention
6. Recognition rather than recall
7. Flexibility and efficiency of use
8. Aesthetic and minimalist design
9. Help users recognize, diagnose, and recover from errors
10. Help and documentation

[Nielsen: 10 Usability Heuristics for User Interface Design](#)

3

1. Visibility of system status

Visibility

- Informative reinforcement
You are now logged in
- Immediate reinforcement
< 1 second

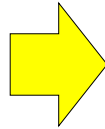
Punishment weakens learning

```
> cd MyFiles  
>
```

4



2. Match between system and the real world - speak the users' language



5

4. Consistency and standards

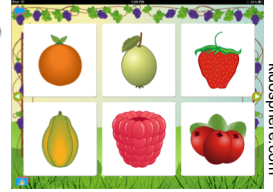
The screenshot displays a browser window with three distinct web pages. At the top is the Amazon header, featuring the Amazon logo, a search bar, and navigation links like 'Departments', 'Browsing History', and 'Today's Deals'. Below that is the Google Drive search bar with the text 'Search Drive'. The main content is the UiO Department of Informatics website, which has a red header with 'Ruter#' and a search icon. The page content includes the UiO logo, the text 'UiO : Department of Informatics', and a navigation menu with items like 'Home', 'Research', 'Studies', 'Student life', 'Services and tools', 'About the department', and 'People'.

6

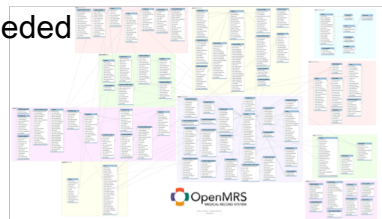


10. Help and documentation

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



- Some computer applications are complex
 - Additional help needed



7

Inline help in the program

- Responding to users' current problem
 - Guidance
 - Not a tutorial primarily designed for teaching
- Users want to **do**, not **read**
 - Minimal distraction from task
 - Short
 - Recognizable language
 - Recognizable graphics

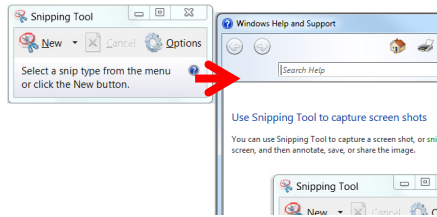
8

Help – Types

Inline – Context-sensitive

- Tooltip
- Wizard
- Help button
- System-initiated

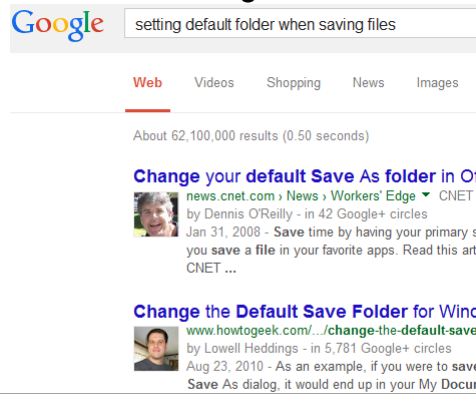
→ Help where you are



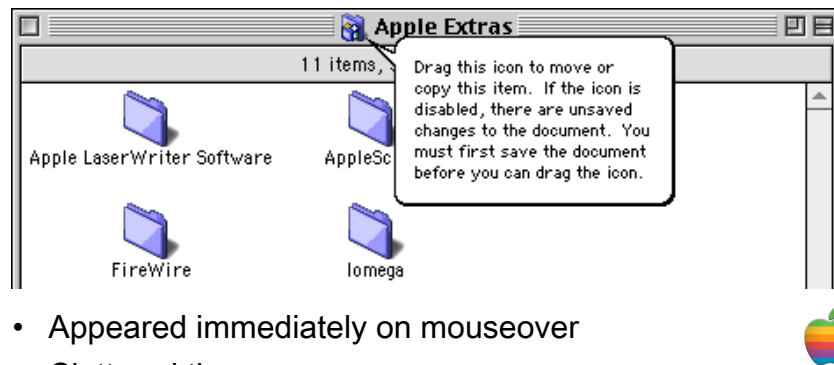
Context-free

- Help system
- Web

→ Search if you don't know where to go



Balloon help

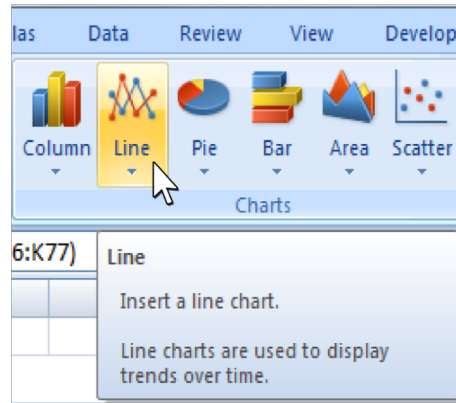


- Appeared immediately on mouseover
- Cluttered the screen



Tooltip – Screentip

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

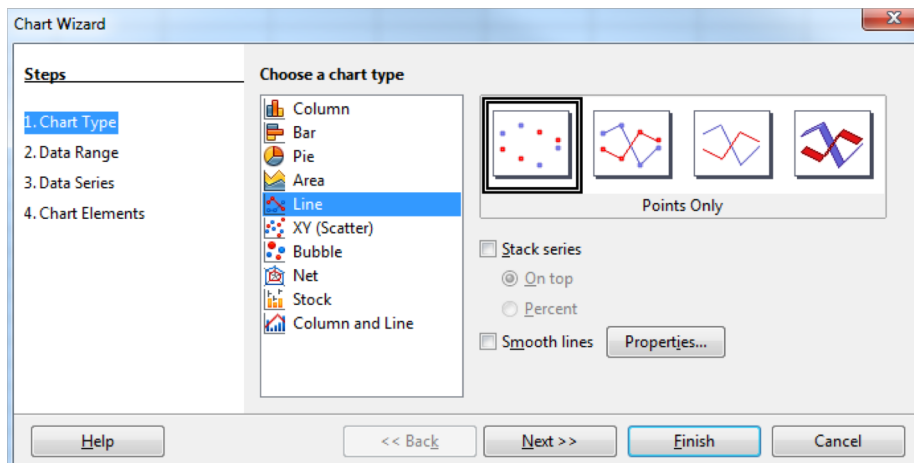


Minimal manual?
Instructions?
Functional model?
Structural model?



11

Wizards carrying out the operations



Minimal manual?
Instructions?
Functional model?
Structural model?



12

Help button → Document

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

**Minimal Manual?
Instructions?
Functional model?
Structural model?**

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

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

- Annoying
- Irrelevant
- Too trivial help

Looks like you're trying to get rid of me. Would you like some help with that?

Hi! I am Clippy, your office assistant. Would you like some assistance today?

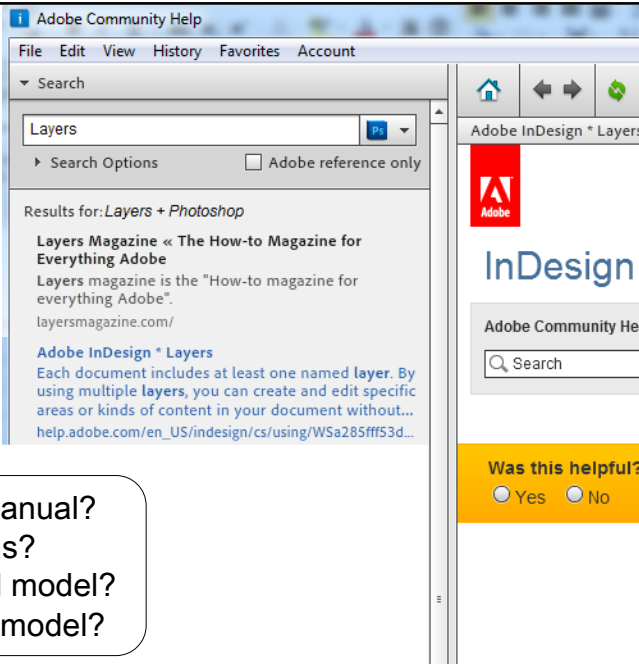
Your computer seems to be turned on.

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Help system

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




Minimal Manual?
Instructions?
Functional model?
Structural model?

15

Recognizable language can compensate for cumbersome search

Product Overview

DSm415pf with optional 1 tray paper bank

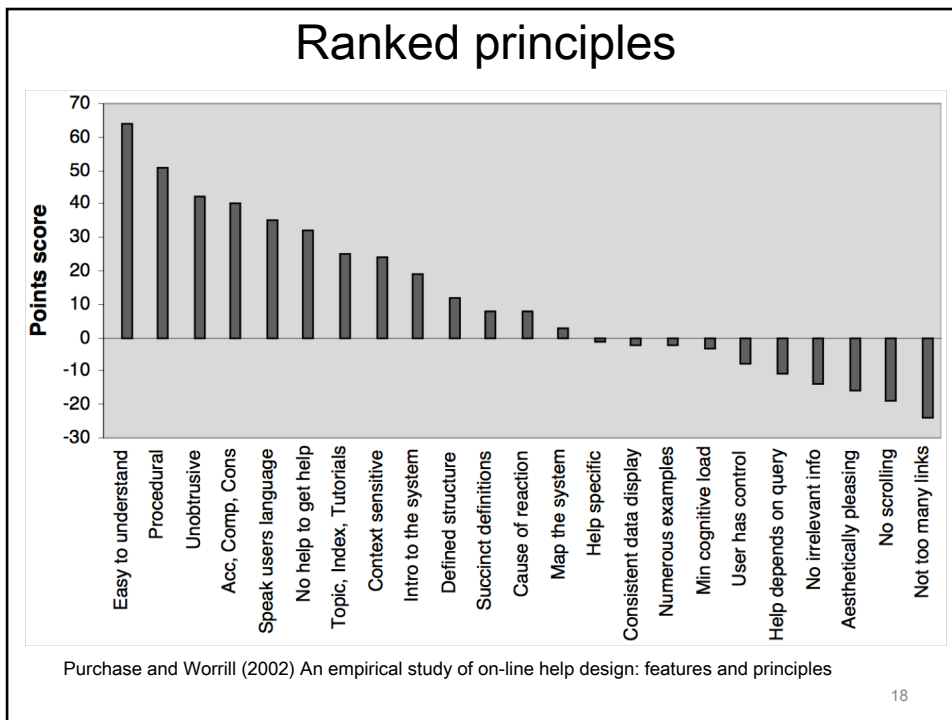
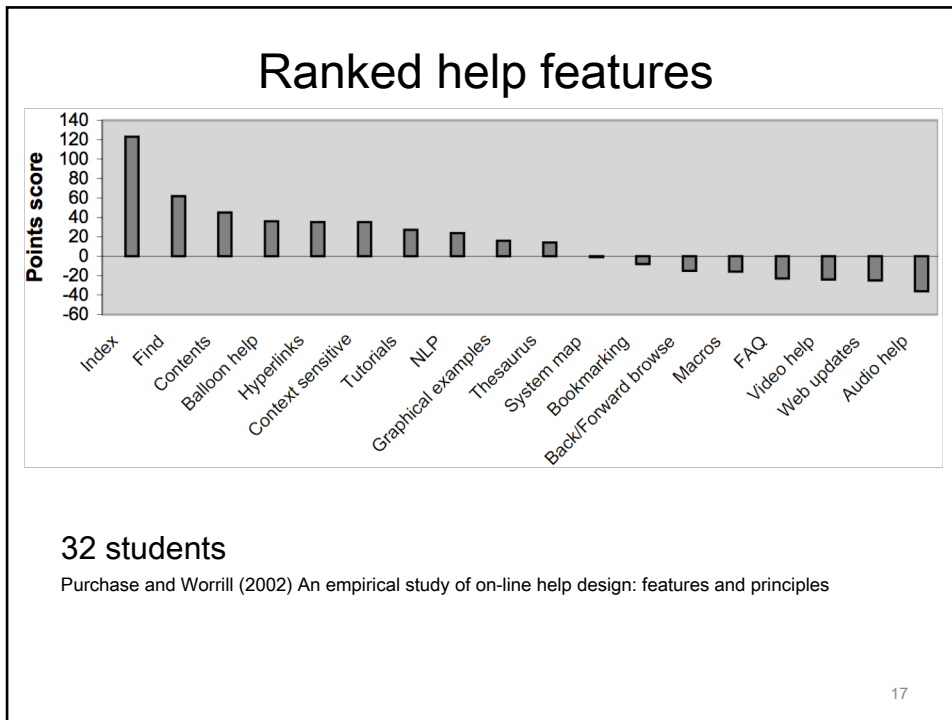


- ADF (standard) Max.30sheets
- Internal Tray Output Capacity: 250 sheets
- Standard Tray 250 sheets
- DSm415pf as "All-in-one" model: Copier + Fax + Printer + Scanner
- Bypass Tray: 100 sheet standard duplex unit
- 1 tray paper bank: Paper capacity:500sheets

Laue (2017)
Borenstein (1986) Help Texts vs. Help Mechanisms: A New Mandate for Documentation Writers

16





Qualities of help

- Way of accessing the help

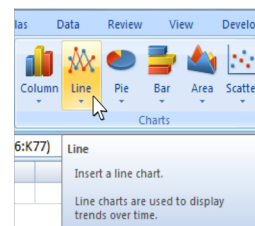
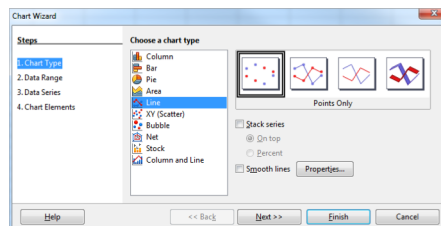
One click

Separate search system

- Contents – scaffold for

Skill

Understanding



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Learnability evaluation

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

20



Heuristic evaluation – software and help

- 3 **independent** learnability experts
- checking all parts of the software and help functionality against the heuristics:
 1. Visibility of system status
 2. Match between system and the real world
 3. User control and freedom
 4. Consistency and standards
 5. Error prevention
 6. Recognition rather than recall
 7. Flexibility and efficiency of use
 8. Aesthetic and minimalist design
 9. Help users recognize, diagnose, and recover from errors
 10. Help and documentation
 1. Instruction sheets or videos.
 1. Sequential
 2. Recognisable
 3. Short
 4. Direction
 5. Complete and Feedback
 6. Users' terminology
 2. Functional and structural models
 1. Recognizable
 2. Examples
 3. Targeted to user group
 4. Include abstract entities

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Questionnaire – System Usability Scale (SUS)

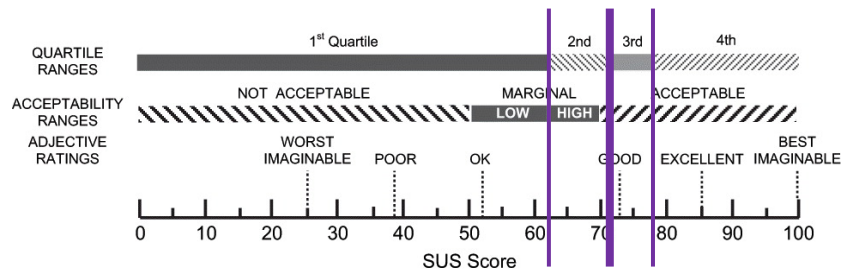
- A standard way of measuring usability*
1. I think that I would like to use this product frequently.
 2. I found the product unnecessarily complex.
 3. I thought the product was easy to use.
 4. I think that I would need the support of a technical person to be able to use this product.
 5. I found the various functions in this product were well integrated.
 6. I thought there was too much inconsistency in this product.
 7. I would imagine that most people would learn to use this product very quickly.
 8. I found the product very awkward to use.
 9. I felt very confident using the product.
 10. I needed to learn a lot of things before I could get going with this product

Level of agreement on a scale 0-10

22



SUS scores based on 206 studies



Bangor, Kortum, Miller (2008) An Empirical Evaluation of the System Usability Scale.
International Journal of Human Computer Interaction

23

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
 - Web services

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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

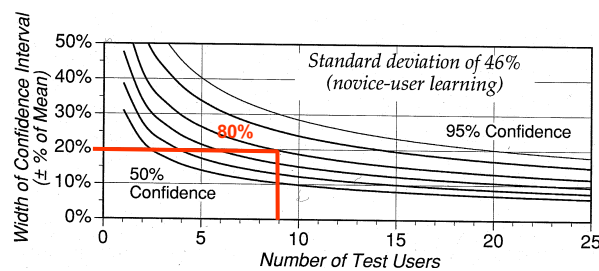


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Learnability – Time

Can be huge variations in typing speeds

1. Find the appropriate number of users.
 1. 80% surety that the real mean lies within a $\pm 20\%$ interval
Eg measured Mean=5 minutes, the real min is in the interval 4-6 minutes



Jakob Nielsen (1993)
Usability Engineering. AP Professional, Boston, p.168

2. From $Y = \pm 20\%$ go to the 80% Confidence interval curve and down to $X = 9$.
2. Give the learner tasks to do.
3. Measure time taken to do each task.

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