# 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
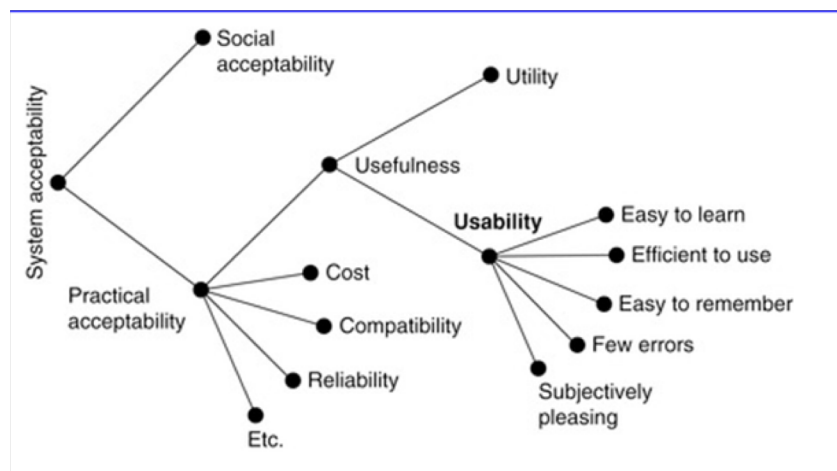
Nielsen (1993) Usability Engineering

2

Jens Kaasbøll

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
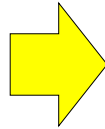- Immediate reinforcement
  < 1 second

Punishment weakens learning

```
> cd MyFiles
>
```

4

Jens Kaasbøll

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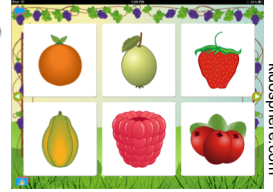### - speak the users' language

5

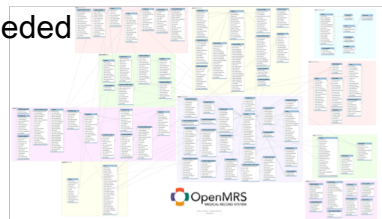## 4. Consistency and standards

6

Jens Kaasbøll

10. Help and documentation

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

kidosphere.com

- Some computer applications are complex
  - Additional help needed

OpenMRS

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
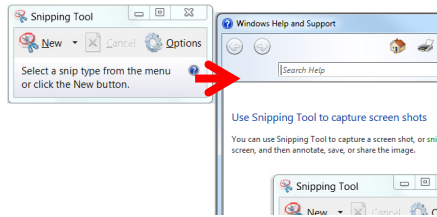 → Recognizable language
  → Recognizable graphics

8

Jens Kaasbøll

Help – Types

Inline – Context-sensitive

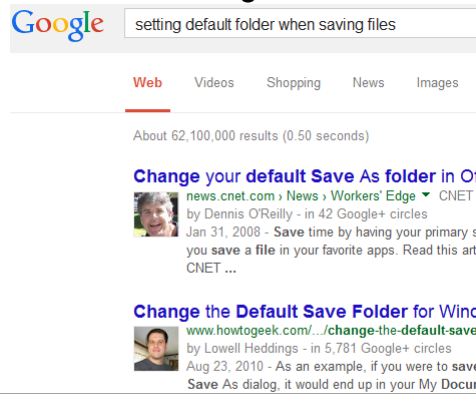- Tooltip
- Wizard
- Help button
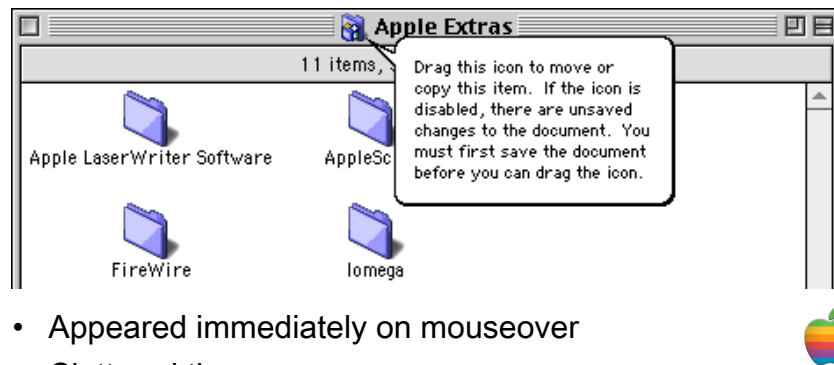- System-initiated
- → Help where you are

Context-free

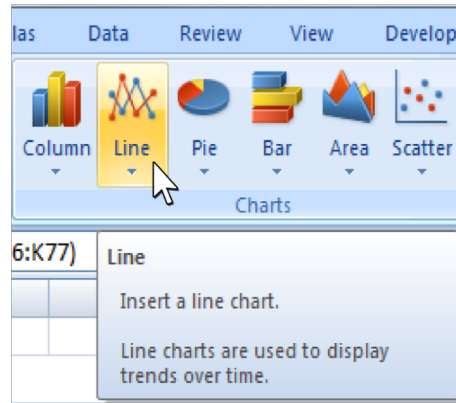- Help system
- Web
- → Search if you don't know where to go

Balloon help

- Appeared immediately on mouseover
- Cluttered the screen

10

Jens Kaasbøll

Tooltip – Screentip

- Help where the user is at the moment
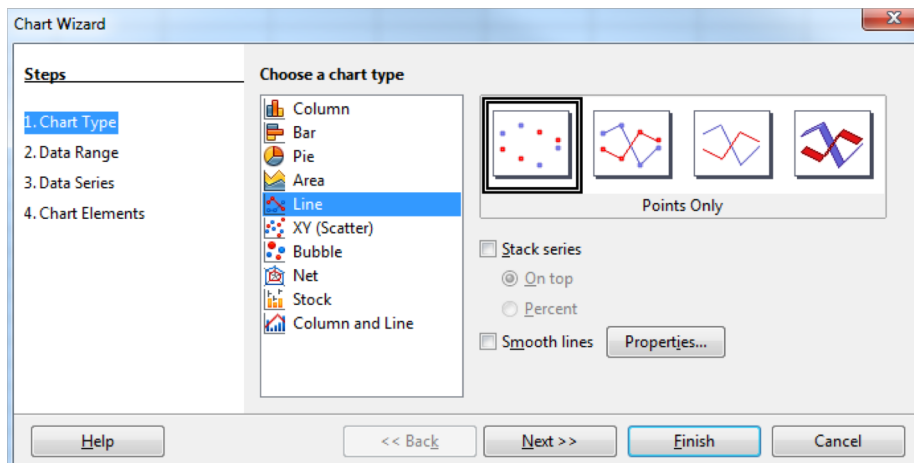- No need for search

  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

Jens Kaasbøll

Help button → Document

Minimal Manual?
Instructions?
Functional model?
Structural model?

13

System initiated – 🪟Clippy

- Annoying
- Irrelevant
- Too trivial help

14

Jens Kaasbøll
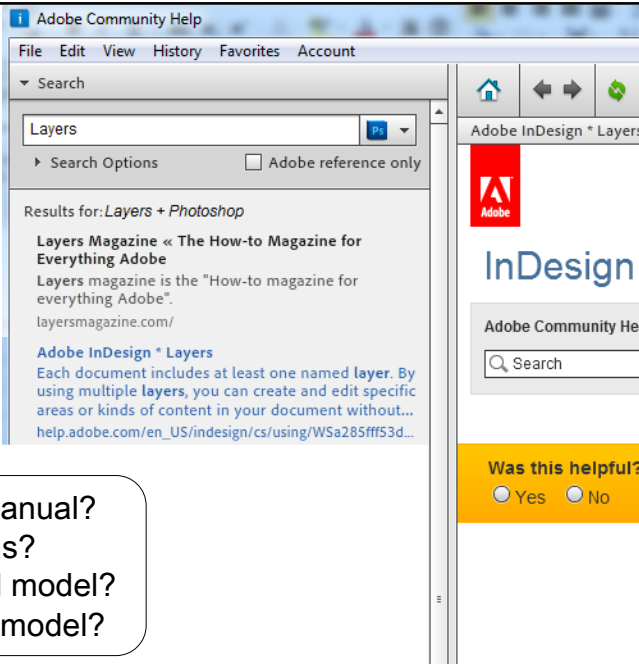
Help system

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

DSm415pf as "All-in-one" model:
Copier + Fax + Printer + Scanner

Internal Tray
Output Capacity:
250 sheets

Bypass Tray: 100 sheet
standard duplex unit

Standard Tray
250 sheets

1 tray paper bank:
Paper capacity:500sheets

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

16

Jens Kaasbøll

Ranked help features

32 students

Purchase and Worrill (2002) An empirical study of on-line help design: features and principles

17

Ranked principles

Purchase and Worrill (2002) An empirical study of on-line help design: features and principles

18

Jens Kaasbøll
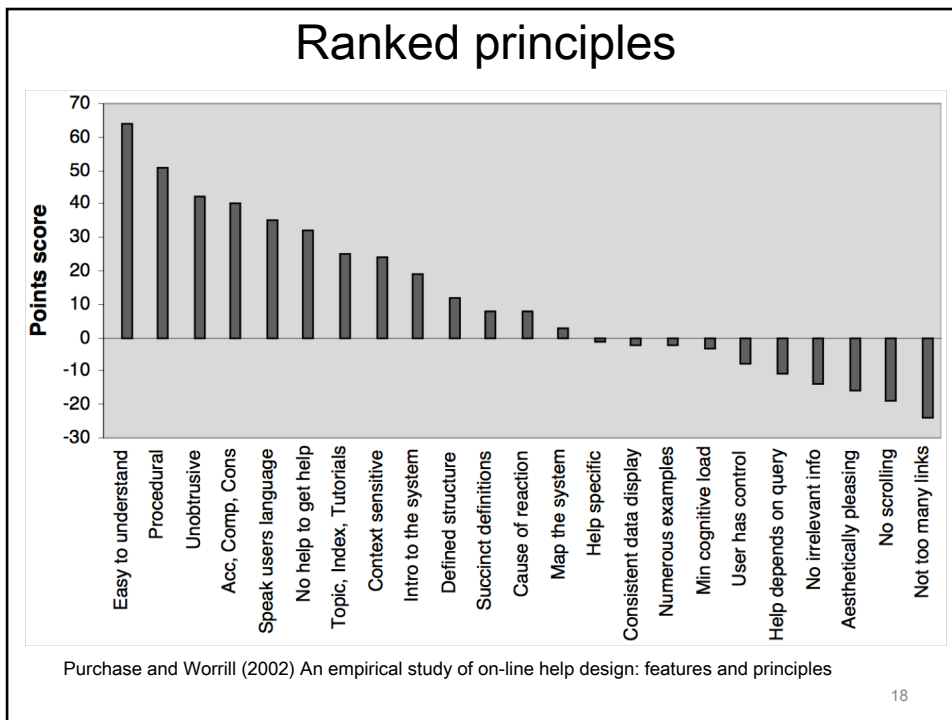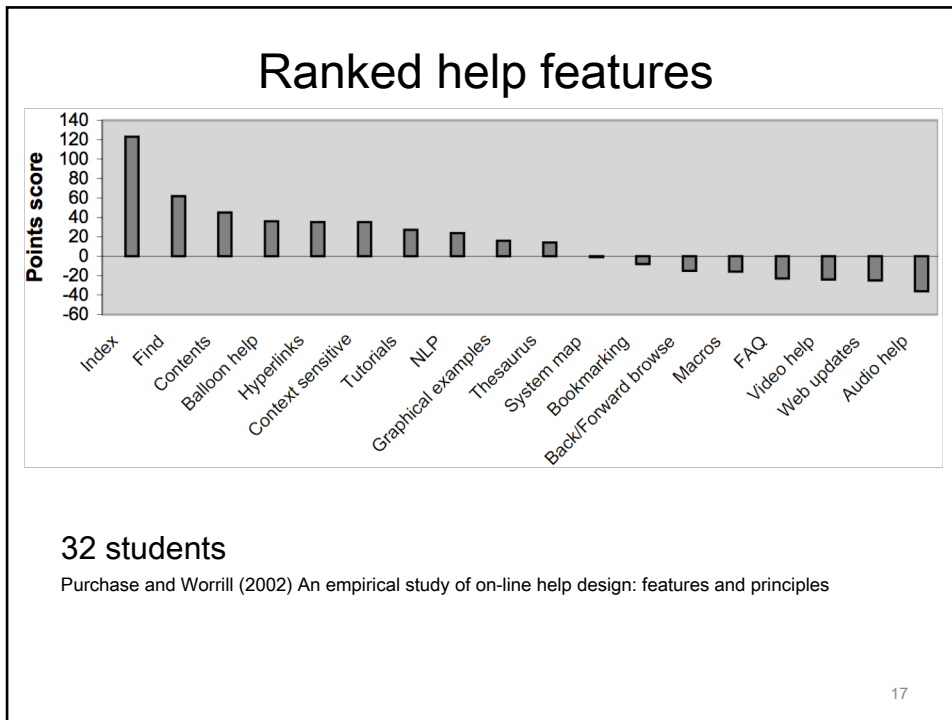
Qualities of help

- Way of accessing the help

  One click ←——————————→ Separate search system

- Contents – scaffold for

  Skill ←——————————→ Understanding
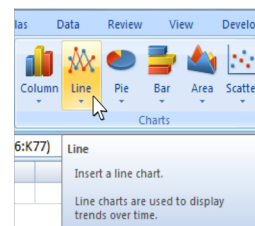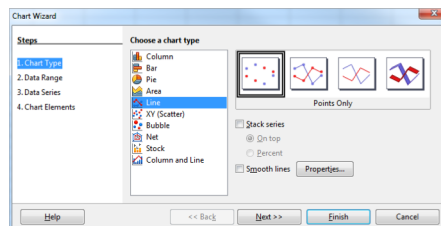
19

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

Jens Kaasbøll

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

21

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

Jens Kaasbøll

SUS scores based on 206 studies
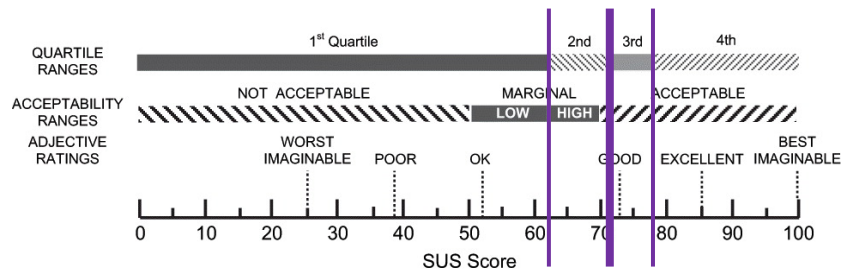
Bangor, Kortum, Miller (2008) An Empirical Evaluation of the System Usability Scale.
International Journal of Human Computer Interaction

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

24

Jens Kaasbøll

Measuring skills learning – software incl. help

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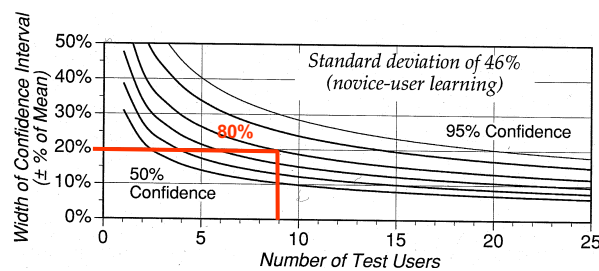 - Counting errors
  - Scaled response to questionnaires

25

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 ± 20% interval
        Eg measured Mean=5 minutes, the real min is in the interval 4-6 minutes

Standard deviation of 46% (novice-user learning)

80%

95% Confidence

50% Confidence

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

Width of Confidence Interval (± % of Mean)

Number of Test Users

    2. From Y = ±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.

26