1. What is evaluation:

Should occur at every stage of the software design life cycle. Result from an evaluation can give feedback to improve design. Has a close link with prototyping. Design changes earlier in the development are easier (prototyping and evaluation helps in identifying early problems).

Two techniques, 1) Expert Analysis, 2) User participation.

1. Goals of Evaluation:
   * 1. Assess the extent and accessibility of system functionality:

Make appropriate functions and make them easily reachable. Also assess effectiveness(performance of user while doing task)

* + 1. Assess user experience of interaction

How easy to learn, enjoyment, satisfaction, emotional response. Identify if certain areas in application overloads the user(‘s memory).

* + 1. Identify specific problems in system

Functionality and usability of the system, like, a feature not working as expected

1. Evaluation through expert analysis:

First evaluation should be done even before implementation. So errors can be found early. But this doesn’t assess actual use of system, we just check if a system follows accepted usability principles

* 1. Cognitive Walkthrough:

Main focus is to check how easy the system is to learn. Actions by supposed user are referred to as step, the evaluator ‘steps through’ the steps and provide story, as to why this step is good for user. To do walkthrough, need 4 things:

* + - 1. Prototype of a system, should be fairly detailed
      2. Description of task user need to perform
      3. Written actions/steps required to perform the task
      4. Detail about who user is(knowledge, XP)

Evaluator goes through steps and answers following questions

1. This actions leads to goal?(useless action?)
2. Will user see this action as available?(hidden behind menus?)
3. If this action is found, will the user know if this is the correct one?
4. After action, will the user understand the feedback?
   1. Heuristic Evaluation:

This means, using the general principles and guidelines and checking if design decisions conform to those. Can be used on design as well as prototypes. Since it is easy, also called “discount usability”. If a design decision violates the heuristics, then evaluator assess the severity of usability problem arising from that, they rate it as follows:

0 = I don’t agree that this is a usability problem at all

1 = Cosmetic problem only: need not be fixed unless extra time is available on project

2 = Minor usability problem: fixing this should be given low priority

3 = Major usability problem: important to fix, so should be given high priority

4 = Usability catastrophe: imperative to fix this before product can be released

Nielsen’s ten heuristics are:

1. Visibility of System Status:
2. Match b/w system and real world:
3. User control and freedom:
4. Consistency and standards:
5. Error prevention:
6. Recognition and Recall: make objects and actions visible. User should not have to recall info from previous dialogue
7. Flexibility and efficiency of use: Allow Accelerators (shortcuts)
8. Aesthetic and Minimalist design:
9. Help user recognize, diagnose and recover from errors: precisely indicate problem and suggest a solution
10. Help and documentations:
    1. Model Based Evaluation:
    2. Using Previous Studies in evaluation:

Does what it says ^, deals with general issues, but can be applied everywhere. Previous studies should be reviewed carefully, e.g., a study of usability of new user != study of usability of expert user.

1. Evaluation Through user participation:

Can only do at a later stage in development, at least when have a working prototype.

* 1. Styles of evaluation
     1. Laboratory studies:

Advantages include, sophisticated recording of user, pre-configured computers, interruption free environment.

Disadvantages include, lack of user distraction(in real world user can get distracted), no context(no work environment), due to lack of context its difficult to observe users cooperate like they do in work environment.

Some situations require lab study, e.g., workplace is in dangerous area ( military, nuclear thingy) OR we need to create specific constrained environment at our will.

* + 1. Field Studies:

Has distraction, but it is also good to observe, interruptions are also important. It allows observation in actual use. Natural environment so users are comfortable. But user still act a little different, since they know that they are being observed.

Both have their pros and cons, and situations where one is better than the other

* 1. Empirical Methods: Experimental Evaluation:

Controlled experiments can be better used to check a claims or hypothesis.

* + 1. Participants

Should be chosen to match expected user population. If not actual users, should be close(age, education, XP, Task knowledge, computer knowledge). Sample size should be chosen depending on budget, but it should be enough to represent the population

* + 1. Variables

Manipulate variables in experiments, two types of them are.

* + - 1. Independent :

The manipulated variable, e.g., style, level of help, icon design, menu items. Different values are given to these variables, each value is called the “level of the variable”. When more than one variables, e.g. 2 commands and 3 menus, then six conditions need to be experimented (multiply)

* + - 1. Dependent:

Variable which can be measured, dependent on independent variable changes. E.g. mistakes made, speed of task.

* + 1. Hypothesis

A prediction of outcome of an experiment. E.g. if this [independent variable] is this, then this [dependent variable] will be this. Disprove by null hypothesis(no change when changing independent variable)

//IGNORE THE FOLLOWING !!! read from the book

* + 1. Experimental Design:
       1. Within-subject:

All with all conditions, transfer of learning problem, but can make groups and change order

* + - 1. Between-subject:

Two groups are assigned one conditions each, one with changed variable, one with same variable

Greater number of participants are required. And individual differences can create oiasndoiasn

* + 1. Statistical Measures:

Use graph and things, cut out outliers

* + 1. Evaluating Icon design
    2. Studies of groups of users
  1. Observational Techniques
     1. Think aloud and cooperative evaluation
     2. Protocol Analysis
        1. Paper and Pencil
        2. Audio Recording
        3. Video Recording
        4. Computer Logging
        5. User Notebooks
     3. Automatic Protocol Analysis Tools
     4. Post-Task Walkthroughs
  2. Query techniques
     1. Interviews
     2. Questionnaires
  3. Evaluate through monitoring physiological responses
     1. Physiological Measurements

1. Choosing an Evaluation Methods
   1. Factors distinguishing evaluation techniques
      1. Design vs. Implementation
      2. Laboratory vs. Field Studies
      3. Subjective vs. Objective
      4. Qualitative vs. Quantitative
      5. Information provided
      6. Immediacy of response
      7. Intrusiveness
      8. Resources