Comp 341/441 - HCI

Spring Semester 2020 - Week 12

Dr Nick Hayward

Video - Design

Paper Prototyping

Rapid Prototyping 1 of 3: Paper Prototyping
Source: YouTube - Google

Video - Design

Digital Prototyping

Rapid Prototyping 2 of 3: Digital Prototyping
Source: YouTube - Google

Video - Design

Native Prototyping

Rapid Prototyping 3 of 3: Native Prototyping
Source: YouTube - Google

Users and Skills

intro

- continue to consider our application's users
- primary challenge involves consideration of product development relative to both beginner and advanced users
  - *how to make usable and productive app for all concerned*
  - *comprehensible and learnable for beginners*
  - *do not hinder expert users from optimal productivity*
- carefully consider user skill levels
- be aware of changes to skill levels over time
- aware of practical ways to help our users attain and improve skill levels
- understanding user's skill levels helps application of interaction concepts and principles

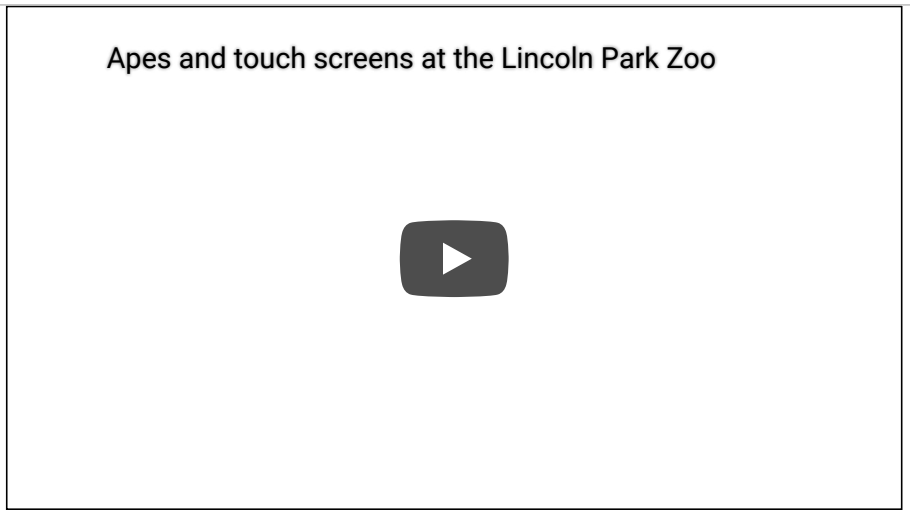
Users and Skills

user categorisation - part 1

- we can often categorise users by application skill levels and aptitude
- evaluation user
  - *testing and evaluating an app and not yet committed to its usage*
  - *trying to determine its suitability for their requirements*
  - *no pressing tasks or action at hand*
- beginner user
  - *trying to accomplish some tasks with the application*
  - *little or no prior experience with the app's usage*
  - *general feelings of uncertainty and learning by trial and error, general experimentation*
  - *some, but not all, will use the available tutorials, help documentation etc*

Video - Users and Skills

Touch screens at Lincoln Park Zoo



Apes and Touch Screens at Lincoln Park Zoo
Source: YouTube - Chicago Tribune

Users and Skills

user categorisation - part 2

- intermediate user
  - *more confident and experienced user, able to complete most of their required tasks*
  - *unlikely they will have explored all of the app's features and options*
  - *user comfort and fluency will not have been achieved for the application*
  - ***perpetual intermediates***
    - Cooper et al. 2007.
- expert user
  - *greater application confidence and certainty*
  - *awareness of product's domain and advanced options*
  - *able to complete tasks with ease, solving problems as they arise…*
- power user
  - *considered an extension of an **expert** user with a fascination of the application*
  - *normally enjoys customising the application and testing its limits*

Video - Usability

Users and skills

Your First Script - Apps Script Tutorials
Source: YouTube

Users and Skills

development of skills

- user classification is inherently a simplistic interpretation of skills acquisition and development
- many disparate factors influence development of skills. For example,
  - *domain knowledge*
    - assumption of underlying, pre-existing knowledge for a given application's scope
  - *general computing skills and knowledge*
    - many applications assume general computing skills and knowledge
    - eg: simple ability to use similar applications
    - ability to use their chosen mode and tools of interaction
  - *general intelligence and reasoning abilities*
    - an assumption of general reasoning and extrapolation skills
    - ability to read and understand help documentation...
  - *persistence, motivation, and dedication*
    - some users will, of course, give up when faced with problems and challenges
    - others are more persistent and will try to solve a problem or issue
    - gamification and rewards may help this issue...

Users and Skills

assumptions - part 1

- consider basic assumptions about users' minimum required skills and knowledge
- often dependent upon goals and functionality of the product, application...
- some inherent assumption of skills for your application
  - *eg: user will be able to use a keyboard, mouse, touchscreen...*
  - *basic level of verbal, reasoning, and mathematical knowledge*
- valid user testing important relative to such assumptions
- testing helps define and highlight unrealistic design choices and assumptions
- modify assumptions and design in response to testing feedback
  - *re-consideration and re-design may be necessary*

Users and Skills

assumptions - part 2

- assumption of Domain knowledge - Documenta Latina
- gaming and applications
  - *eg: Royal Game of Ur*

Royal Game of Ur

Source - Royal Game of Ur British Museum

Video - Users and Skills

Deciphering the world’s oldest rule book

Deciphering the world’s oldest rule book
Source: The British Museum - YouTube

Video - Users and Skills

The Royal Game of Ur

The Royal Game of Ur
Source: The British Museum - YouTube

Users and Skills

skill levels and design - part 1

- evaluators
  - *design needs to present good first impression, be pleasing overall, and inviting*
  - *should not give the impression of being overly complex*
  - *introductory material, such as demo video or guided tour with step-by-step instructions*
  - *sample files, demo material allows users to test functionality and see what is possible*
- beginners
  - *functionally easy for our users to learn and discover an application*
    - eg: offer wizard style guidance to create an initial project, document
    - easy undo/redo errors and mistakes - hopefully promotes experimentation in the app
    - in-depth tutorials and intro guides, such as manuals, help videos, online help

Users and Skills

Fun exercise - part 1

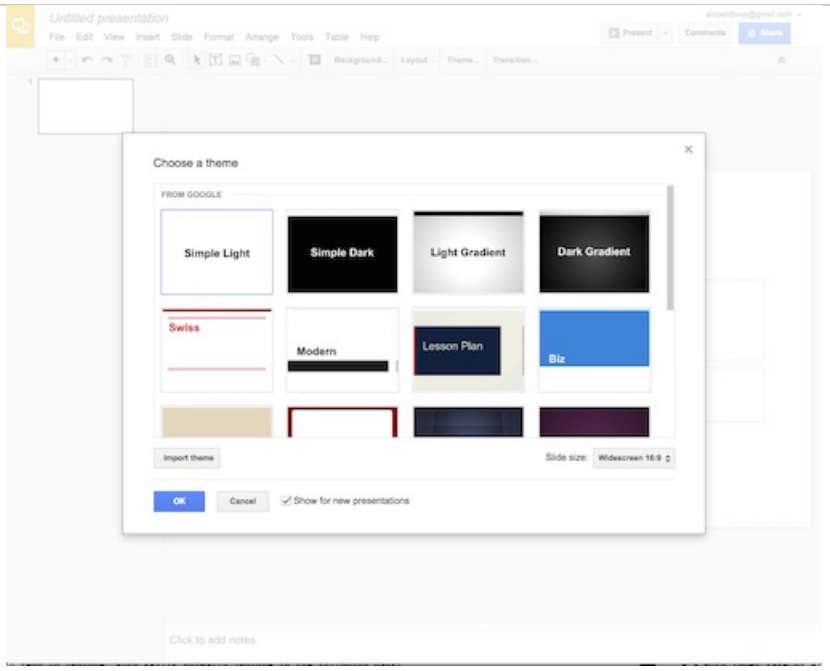
Consider a mobile or web based application to help users search for properties, e.g. house, apartment, to buy or rent

Then, outline the following

- initial UI concepts designed to engage and attract an **evaluator** user
- key features and functionality to allow a **beginner** user to quickly understand and use the application
  - *e.g. how to promote core functionality?*
  - *how to encourage initial usage without a steep learning curve?*
  - *...*

Image - Users and Skills

getting started



Google Slides - Getting Started

Source - Google Slides

Users and Skills

skill levels and design - part 2

- intermediate
  - *in addition to the above considerations*
    - fully indexed and searchable help resources
    - allow users to quickly find exactly what they need
    - online forums and social options and interaction promote sense of community
- expert
  - *quick completion of tasks with maximum efficiency*
  - *provide shortcut options, keys, and greater customisation options*
  - *bypass and limit beginner tools, wizards, menus etc...*
- power
  - *allow greater freedom for users and interaction*
  - *user developed scripts, plugins, add-ons*
  - *developer tools, APIs, discussion forums, manuals...*
  - *carefully consider security implications*

Users and Skills

Fun exercise - part 2

Continue the design of a mobile or web based application to help users search for properties...

Then, outline the following

- consider further features and functionality for **intermediate** and **expert** users
- how may we balance these new features with the previous requirements &c. for a **beginner** user?

Users and Skills

skills change over time

- familiarity, experience, and comfort with an application often increase a user's skills
- skills tend to improve as follows
  - *improved awareness of the application's options, tools, and capacity*
  - *improved and increased awareness of how to perform tasks, handle special cases successfully*
  - *a much lower rate of errors, issues, and mistakes*
  - *increased rate of productivity and completion, speed, efficiency, and so on…*
  - *a general increase in confidence and greater ease at achieving a sense of flow with the application…*
- might also expect general improvement in quality of work
  - *quality often hard to define, measure, and assess*
  - *easier for procedural tasks and jobs than conceptual*

Users and Skills

practice makes perfect

- improve skills through regular practice
- for our applications and products
  - *ensure users practice and repeatedly perform given tasks*
- some application scenarios naturally make it easier for users to practice
- simple act of repetition of regular tasks often mimics regular practice
  - *practice due to necessity*
- *“people generally become skilled in whatever becomes routine for them.”*
  - *Card et al. P.188. 1983.*
- **deliberate practice** is the act of intentionally practicing with focused attention
  - *specific goal of improving skill levels, working and training at increasing levels of difficulty*
  - *often requires careful monitoring and evaluation of work and results*
  - *motivation and self-improvement important*

Users and Skills

Fun exercise - part 3

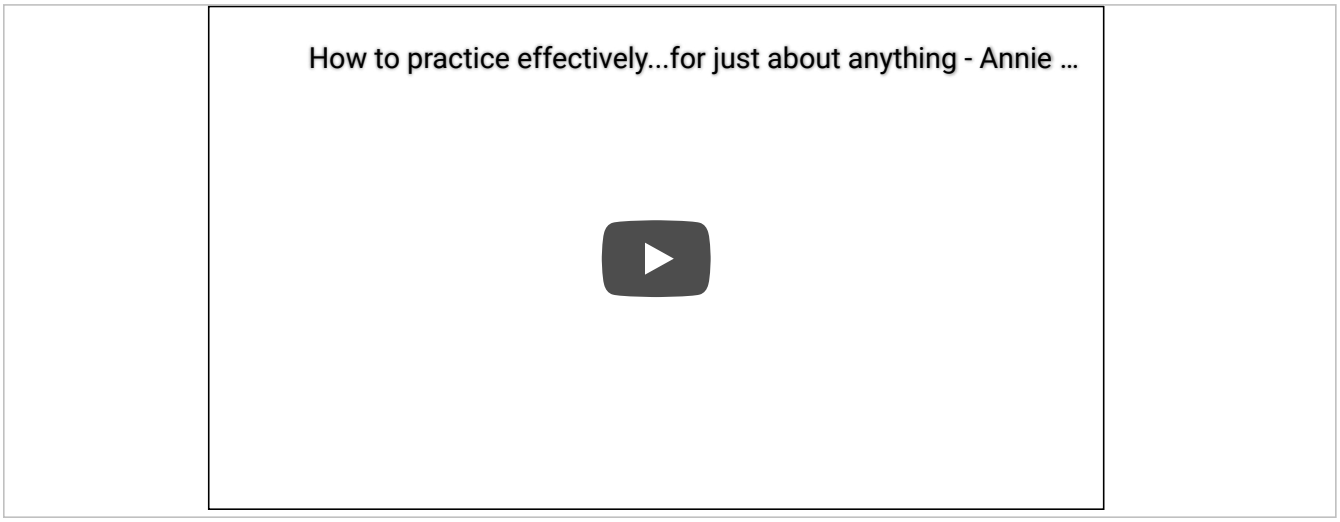
Continue the design of a mobile or web based application to help users search for properties...

Then, outline the following

- consider training and practice options for **beginner** and **intermediate** users
- how may we introduce both *implicit* and *explicit* options?

Video - Users and Skills

How to practice effectively…



‘How to practice effectively…’
Source: TED-Ed - YouTube

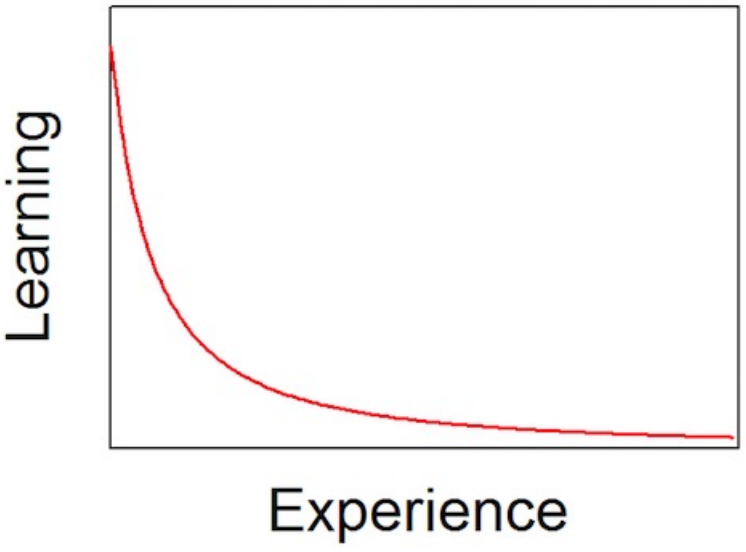
Users and Skills

monitoring practice and skills

- **Power Law of Practice** - Card et al. 1983
  - *applies to most mechanical and cognitive skills, not always relative to knowledge acquisition*
- as users gain in experience relative to increased practice
  - *related application performance tends to increase rapidly, then slow to a steady rate*
  - *steady peak normally reflects attained peak performance for the practiced skill*
- lack of practice naturally leads to loss of performance and skill
  - *drop in frequency and intensity of practice*
  - *motor skills do not normally atrophy as quickly as knowledge based skills*
  - *simple to refresh these skills with a period of further training and practice*
- designers need to be aware of this potential for skills atrophy * complex, detailed applications may consider detailed help systems, options * allow a user to quickly refresh knowledge using practice exercises, tests, incentives…

Image - Users and Skills

power law of practice



Power Law of Practice

Source - Wikipedia

Video - Users and Skills

How to read music

‘How to read music’
Source: TED-Ed - YouTube

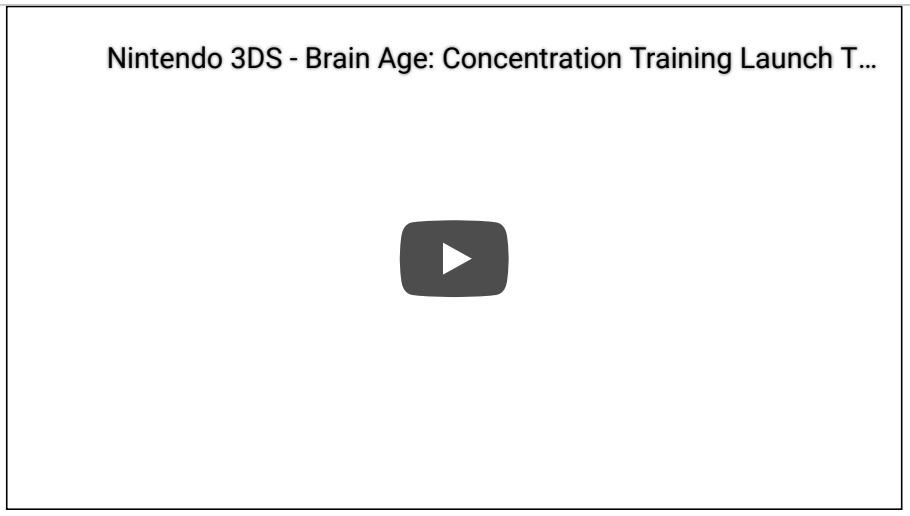
Users and Skills

gaining competence

- practice allows us to determine improvement relative to a given activity
- **four stages of competence** model suggested by Robinson in 1974
- this model suggests the following stages a user may follow to mastering a skill
  - *unconscious incompetence*
    - user is unaware of how bad he or she may be relative to a particular skill
    - may even by unaware that the skill exists
  - *conscious incompetence*
    - as user attempts a given skill, they become increasingly aware of a deficiency of skills
    - realise need to improve that skill through further training, learning, practice…
    - may be a daunting and overwhelming realisation for many users
  - *conscious competence*
    - practice allows a user to engage in training sessions, exercises…
    - effectiveness of such training can vary greatly
    - often dependent upon task itself, suitability of chosen practice and training
  - *unconscious competence*
    - complete a task without really thinking
    - act of working, completing an exercise has become natural to the user
      - do not really need to think about the given act…
- games are a good example of hands-on training and practice

Video - Users and Skills

Nintendo’s Brain Age



Nintendo Brain Age: Concentration Training
Source: YouTube

Resources

- Card, S.K., Moran, T.P. and Newell, A. *The psychology of human-computer interaction.* Lawrence Erlbaum Associates. 1983.
- Robinson, W.L. *Conscious competency - the mark of a competent instructor.* Personnel Journal, 53. PP. 538-9. 1974.
- Shackel, B. *Usability - context, framework, design, and evolution.* Human factors for informatics usability. Cambridge University Press. PP. 21-38. 1991.