Center for LifeLong Learning & Design

University of Colorado at Boulder

Wisdom is not the product of schooling but the lifelong attempt to acquire it.
- Albert Einstein

The Computer Clubhouse
—
Design Informal Learning Environments for Collaboration

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Background and Papers

- "The Computer Clubhouse: Technological Fluency in the Inner City" by Mitchel Resnick, MIT Media Laboratory, Natalie Rusk, Science Museum of Minnesota, Stina Cooke, The Computer Museum — at:
  http://web.media.mit.edu/~mres/papers/Clubhouse/Clubhouse.htm

- "A Networked, Media-Rich Programming Environment to Enhance Technological Fluency at After-School Centers in Economically-Disadvantaged Communities", a research proposal by Mitchel Resnick, MIT Media Laboratory, Yasmin Kafai, UCLA, John Maeda, MIT Media Laboratory —at:
  http://web.media.mit.edu/~mres/papers/scratch-proposal.pdf

- **Computer Clubhouse**
  - a network of after-school learning centers for youth from economically-disadvantaged communities
  - 75 sites in 14 countries, with 20,000 youth members
  - Computer Clubhouse Organization — at
    http://www.computerclubhouse.org/index.htm
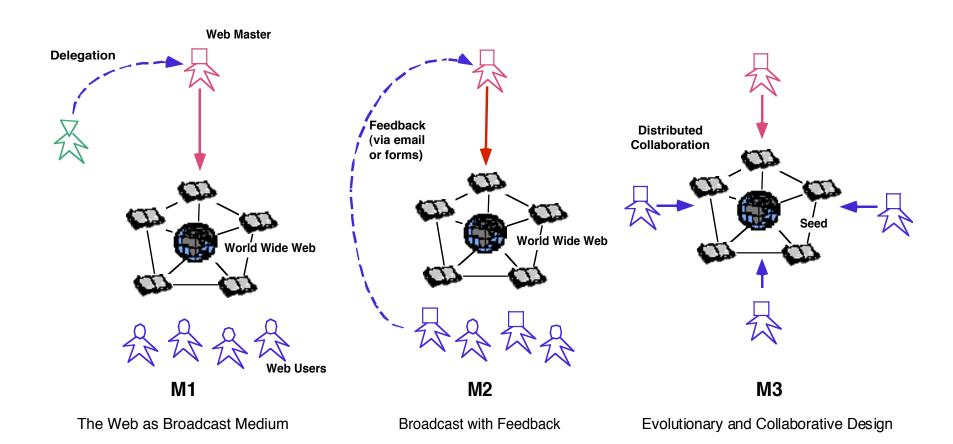
Access is Not Enough

- **access → informed participation**

- **consumer → designer**
    Fischer, G. (2002) *Beyond 'Couch Potatoes': From Consumers to Designers and Active Contributors,* in FirstMonday (Peer-Reviewed Journal on the Internet), at
    http://firstmonday.org/issues/issue7_12/fischer/.
    →**More about this on March 3**

- **three models of the WWW**

Three Models of the WWW

Delegation

Web Master

**Feedback
(via email
or forms)**

World Wide Web

World Wide Web

**Distributed
Collaboration**

Seed

Web Users

M1

M2

M3

The Web as Broadcast Medium

Broadcast with Feedback

Evolutionary and Collaborative Design

Clubhouse Principles

- **Principle 1:** Support Learning through Design Experiences

- **Principle 2:** Help Youth Build on their Own Interests

- **Principle 3:** Cultivate "Emergent Community"

- **Principle 4:** Create an Environment of Respect and Trust

Research "Products" by the Clubhouse Effort

- the two **Lego Trucks**

- Programmable brick → **LEGO Mindstorms** (used by millions around the world)

- Logo → **Starlogo**: instead having one turtle, one has thousands of them

- **video from Alexander Repenning**

- research proposal: a **model for your project proposal** ("hands on") for the DLC course

- **Scratch:**
  - add programmability to the media-rich and network based activities popular among the Clubhouse members
  - Photoshop Culture → Programming Culture

Familiarity and Fluency with Digital Media

- **claim**: as new technologies proliferate and play increasingly important roles in all aspects of society, most people are "poorly equipped to recognize, let alone ponder or address, the challenges technology poses or the problems it could solve"

- **familiarity** = "knowing the grammar" is not good enough

- **fluency** with information technologies:
    - the ability to reformulate knowledge, to express oneself creatively and appropriately, and to produce and generate information (rather than simply to comprehend it)
    - goes beyond traditional notions of computer literacy
    - requires a deeper, more essential understanding and mastery of information technology for information processing, communication, and problem solving

The Clubhouse Culture

- the Computer Clubhouse encourages young people to become designers, inventors, and creators as they work on projects based upon their own interests, supported by adult mentors and other youth

- many young people discover the artist in themselves as they create original music, write scripts, film and edit live video and stop-motion animation, and explore many other types of projects to make their creative dreams come true

- at the Clubhouse there exists: a Photoshop culture, but no programming culture

Goals of the Research Project

- transform the use of technology at after-school centers, moving beyond basic computer activities to enable young people to achieve deeper fluency with information technologies

- broaden opportunities for youth from under-represented groups to become designers and inventors with new technologies

- advance understanding of the effective and innovative design of new information and communications technologies for informal math and it education

- make research-based educational technologies, and the ideas underlying those technologies, accessible to larger and more diverse audiences

- further collaboration of young people across geographic, cultural, and language barriers

Scratch: Design Criteria

- youth see the tool/activities as "cool," resonating with their interests and passions

- youth see the value and potential of the tool right away

- youth can create a first project with the tool quickly and easily→ **low threshold (usable)**

- youth can create "products" that they can show off to others (pride of authorship)

- the tool supports a wide range of different types of activities

- the tool/activities appeal to youth of different backgrounds and cultures

- the activities fit into the social dynamic of the Clubhouse

- youth can learn features of the tool gradually and incrementally → **increasingly complex microworlds**

- youth can continue to use the tool in ever more complex ways over time → **high ceiling (useful)**

Scratch: Core Feature

- Building-block programming

- Programmable manipulation of rich media

- Deep shareability

- Seamless integration with the physical world.

- Support for multiple languages.

- Implementation: Scratch will be written in Squeak, an open-source implementation of theSmalltalk-80 language

Tools for Thought

- When people think about thinking, they often imagine Rodin's famous sculpture The Thinker. Rodin's Thinker is a solitary thinker, sitting by himself, with his head resting on his hand. This image seems to say: if you just sit by yourself quietly, and concentrate hard, you will do your best thinking.

- But that image provides a very restricted view of thinking—and one that is becoming less and less relevant in today's digital world. In recent years, there has been a growing recognition that thinking usually happens through *interactions*—interactions with other people and interactions with media and technologies. New media and technologies support new representations of knowledge, which in turn enable new ways of thinking about problems.

Thinking, Learning and Working —The "Wrong" Image?

Tools for Thought — Continued

- the Clubhouse helps young people become fluent with these new "tools for thought." Two product managers from Adobe, a leading software company, spent several days at the Clubhouse, hoping to gain insights on how they might change and improve their products. Afterwards they wrote

  > We were amazed at the incredible rate the kids learned complex products such as Photoshop and Director and how they used the software almost as an extension of themselves. The kids seem to have a lot more enthusiasm and creativity in the work since they choose their own projects and determine for themselves what they want to do. I liked how the more experienced members trained the new members how to do things and how they took responsibility for the computers and their setups. Clearly the Clubhouse is their clubhouse, not someone else's place.

- their comments capture some of the core ideas underlying the Clubhouse approach: young people working on design projects
  - following their own interests
  - developing fluency with new technologies
  - sharing knowledge as a member of a community,
  - becoming self-confident as learners.

Tools for Thought — Continued

- creating this type of learning environment isn't easy. At times, the Clubhouse might seem chaotic. It takes trust and patience to allow youth to follow their own interests and learn from their experiences.

- but the Clubhouse should not be seen as an unstructured environment: although youth have great freedom in choosing their projects, there is structure embedded in the design of the materials, space, and community. Through its choice of mentors, sample projects, and software tools, the Clubhouse provides a framework in which rich learning experiences are likely to develop.

- the long-term goals:
    - make these types of experiences available to youth in low-income neighborhoods across the country
    - Several more Computer Clubhouses are already under development
    - Youth at different Clubhouses will collaborate on joint design projects through the Internet, and mentors and staff will share ideas across sites
    - hope: these new Clubhouses will serve as models, sparking people to rethink their notions of technology, learning, and community.

Tools for Thought — Continued

- Many previous technology-and-learning projects have fallen short of expectations. The Logo programming language, pioneered at MIT during the 1970s, spread to tens of thousands of schools in the 1980s. But as it spread, Logo experienced what Seymour Papert has called "epistemological dilution." It was used very differently than the designers of the language had intended, and results were disappointing in many schools.

- It is now clear that technological tools themselves, no matter how well they are conceived and designed**, are not enough**. As new Clubhouses open, the ultimate challenge will be to disseminate not only the technology, but also the principles, philosophy, and spirit of the original Clubhouse.

Tools for Thought — Continued

- important observations/comments:
    - the incredible rate the kids learned complex products such as Photoshop and Director and how they used the software almost as an extension of themselves
    - The kids seem to have a lot more enthusiasm and creativity in the work since they choose their own projects and determine for themselves what they want to do
    - the more experienced members trained the new members how to do things and how they took responsibility for the computers and their setups
    - Clearly the Clubhouse is their clubhouse, not someone else's place.

- observations/comments capture some of the important ideas driving the Clubhouse enterprise:
    - young people working on design projects, following their own interests
    - developing fluency with new technologies
    - sharing knowledge as a member of a community
    - becoming self-confident as learners.

Creating this type of learning environment is not Easy

- the Clubhouse might seem chaotic → It takes trust and patience to allow youth to follow their own interests and learn from their experiences

- the Clubhouse should not be seen as an unstructured environment: although youth have great freedom in choosing their projects, there is structure embedded in the design of the materials, space, and community

- through its choice of mentors, sample projects, and software tools, the Clubhouse provides a framework in which rich learning experiences are likely to develop.