University of Colorado at Boulder

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

Beyond "Couch Potatoes": From Consumers to Designers and Active Contributors

Gerhard Fischer

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An Example of a "Couch Potato" (source: Haderer in "Stern" Magazine)

A Consumer Perspective / Mindset

- **expert systems**:
  - reducing knowledge workers to giving yes/no answer to multiple choice questions (e.g. MYCIN) → behaviorally unacceptable computational environments

- **ease of use** (within CHI): naive users, idiot-proof systems, "X for Dummies"

- **keynote speech at CHI'95** (by Time Warner research director): basic challenge for CHI community: design a remote control for 500 TV channels

A Designer Perspective / Mindset

"The experience of having participated in a problem
makes a difference to those who are affected by the solution.
People are more likely to like a solution
if they have been involved in its generation;
even though it might not make sense otherwise" — Horst Rittel

- putting owners of problems in charge
- competent practitioners worrying about tasks; motivated to contribute and to create excellent products
- personal growth (low threshold and high ceiling)
- independence from "high-tech scribes" (unself-concious cultures of design; Alexander)
- control and conviviality (Illich)
- communities of practice (CoPs) and communities of interest (CoIs) → transition from a large contribution by a few to a small contribution by many (decentralization)

Designers Mindsets and Convivial Tools

- **convivial tools and systems (Illich 1973):** "allow users to invest the world with *their* meaning, to enrich the environment with the fruits of *their* vision and to use them for the accomplishment of a purpose *they have chosen*"

- conviviality is a dimension that sets computers apart from other media that are **passive** and cannot conform to the user's own tastes and tasks

- passive technologies offer some selective power, but they cannot be **adapted and extended** in ways that the designer of the systems did not directly foresee

- **convivial systems encourage**
  - users to be actively engaged in generating creative extensions to the artifacts given to them and the organizations they are involved in
  - have the potential to break down the counterproductive barrier between programming and using programs (users become co-developers)

- **claim:** most current computer systems are not convivial → software is not "soft"

Beyond Binary Choices — The Consumer/Designer Spectrum

- **claims:**
  - there is nothing wrong being a consumer (watching a tennis match, listening to a concert, ...)
  - the same person is and wants to be a consumer in some situations and in others a designer
  - consumer / designer is not an attribute of a person, but of a context

- **problems:**
  - someone wants to be a designer but is forced to be a consumer (personally *meaningful* activities)
  - someone wants to be a consumer but is forced to be a designer (personally *irrelevant* activities)

Beyond Binary Choices — The Consumer/Designer Spectrum

Consumer <----------> Designer

passive consumer

active consumer

end-user

user

power users, local developers

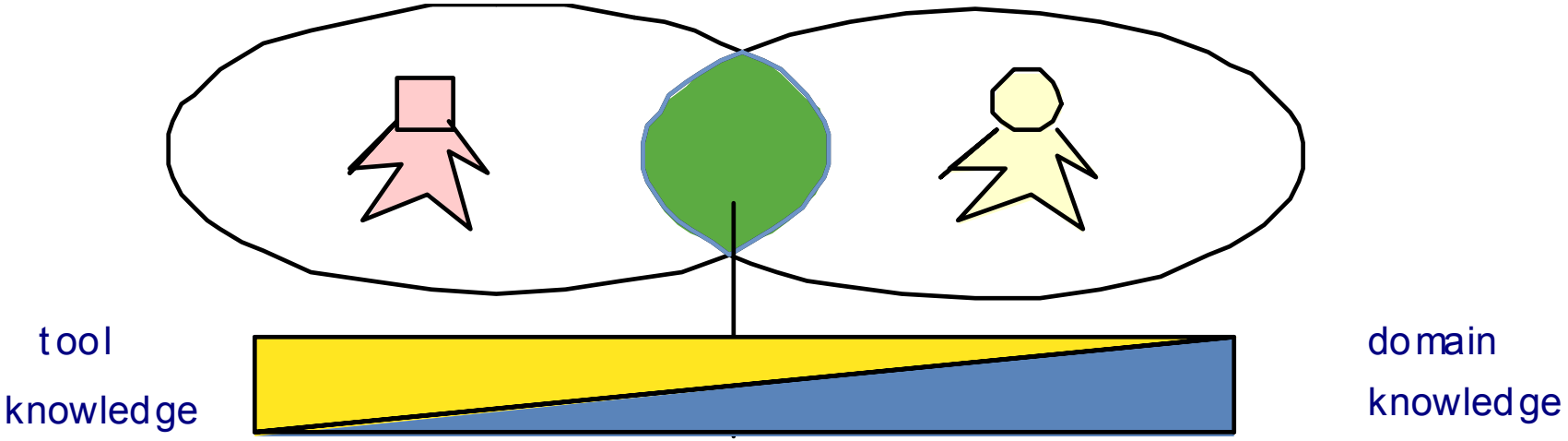
domain designer

meta-designer

Comparing Consumer and Designer Roles

	consumer	designer
activity	watch; use; listen; surfe; access	construct; change; make your own waves; informed participation
learning effort	small	large
depth of understanding	shallow	deep
engagement	normal	substantial
mismatch	wanting to be a designer in personally relevant activities	wanting to be a consumer in personally irrelevant activities
rewards	none, because no tangible artifact is constructed	personal involvement; peer recognition, social capital

High-Tech Scribes, Power Users, and Knowledge Workers in Domains



high-tech scribe power-users knowledge workers

boundary objects / bridge objects

Technology and Media Support for Consumer and Designer Roles

- **Consumer Roles**
  - TV
  - lecture (students in classrooms)
  - citizens
  - printed version of the **Boulder County Healthy Communities Initiative (BCHCI) indicator report**
  - Web (M1 model)

- **Designer Roles**
  - DODEs
  - Envisionment and Discovery Collaboratory
  - PitaBoard
  - Dynasite / livingOM / Swiki
  - Agentsheets / Visual AgenTalk / Behavior Exchange
  - Web (M3 model)

Indicator—Vehicle Miles Traveled (from the printed version)

19. VEHICLE MILES TRAVELED (VMT)

Indicator Description

Any time you take your car to the market, drop the kids off at school, or go to the movies, the number of miles traveled in your vehicle is your personal VMT. VMT for Boulder County is aggregated annually by the Boulder County Transportation Department. VMT includes miles traveled by public transit vehicles.

Why We Are Measuring This

VMT is primarily an indicator of automobile use. The prevalence of single-occupancy vehicles is largely responsible for a wide range of unsustainable trends at the local level that also have global implications. Suburban sprawl, degradation of air quality, more and more pavement, habitat fragmentation and destruction and human health problems, not to mention global environmental change, are all negative trends that are closely related to our dependence on automobiles.

What the Data Show

VMT has steadily increased in Boulder County since 1990. From 1990 to 1996, VMT increased by almost 38%. Population and vehicle registrations both increased by 14% over the same time, which means that VMT has grown almost three times faster than the number of people and cars.

Since the car is associated with so many negative impacts and since the public is being exhorted to drive less, there must be viable transportation alternatives for people to choose from instead of driving. Future indicators should be developed which measure alternative transportation accessibility and usage in Boulder County.

QUALITY OF LIFE IN BOULDER COUNTY - 1998

Printed Publication of the Indicator Report (1998)

- **indicators project**
  - over several years developed a set of indicators to measure the health of the county along various dimensions as well as means to gather and track that information
  - the report has been written to make the information understandable to the general public,
  - 10,000 copies have been distributed
  - response to the report has been mostly passive, and the desired effect of encouraging involvement has not been achieved

- **claims:** the report has not fostered participation because
  - the information in the report is presented in static format
  - it is not clear to citizens how to contextualize the data to their lives and how they can become more involved

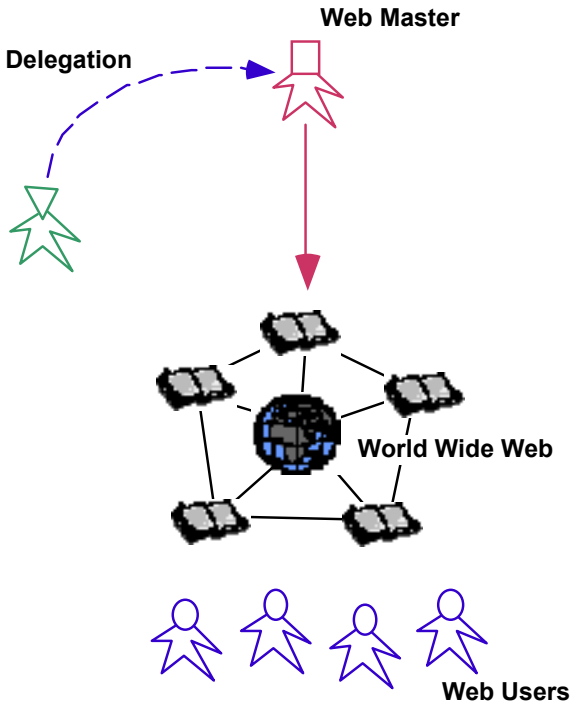
Living Information Environments through Informed Participation

- exploration of underlying data, assumptions, projections
- correlation among data/indicators (e.g., how is traffic related to job market, housing affordability)
- extensible argumentation about interpretation, assumptions, projections, and possible interventions
- ongoing inclusion of new data
- links to:
  - alternate data sources
  - discussion forums
  - simulations representing various potential outcomes of current trends or trends based on potential changes in behavior
- ranking relative importance of indicators
- creation of new indicators

Challenges Created by Informed Participation

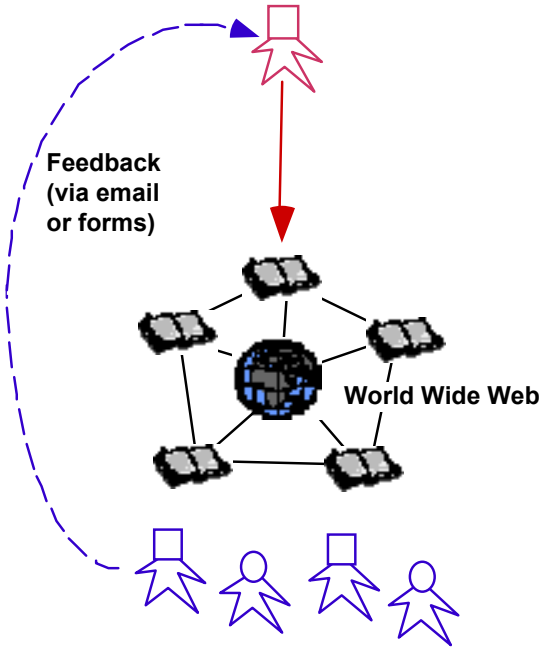
Issue	Challenge	Supporting Substrate
design is an argumentative process	exploring design alternatives	perspective mechanisms (WebGuide)
symmetry of ignorance	all stakeholders contribute actively as sources of power for mutual learning	end-user modification substrates (Visual AgenTalk, DynaSites)
incorporating an emerging design in a set of external structures	record the design process and the design rationale	organizational memory (Dynasite, livingOM)
creating low-cost modifiable models	creating shared understanding; having a conversation with the materials	emergent integrated hard- and software environments (EDC, PitaBoard, CoVE)
design artifacts are mute	increasing the “back-talk” of the artifacts	critics, LSA
using simulations to engage in “what-if” games	replace anticipation of the consequences of our assumptions by analysis	AgentSheets, Swiki

WWW: From Broadcast to Collaboration Medium



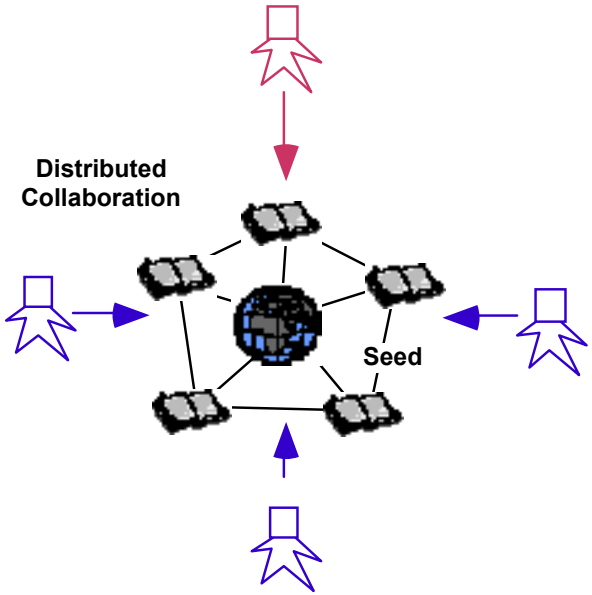
M1

The Web as Broadcast Medium



M2

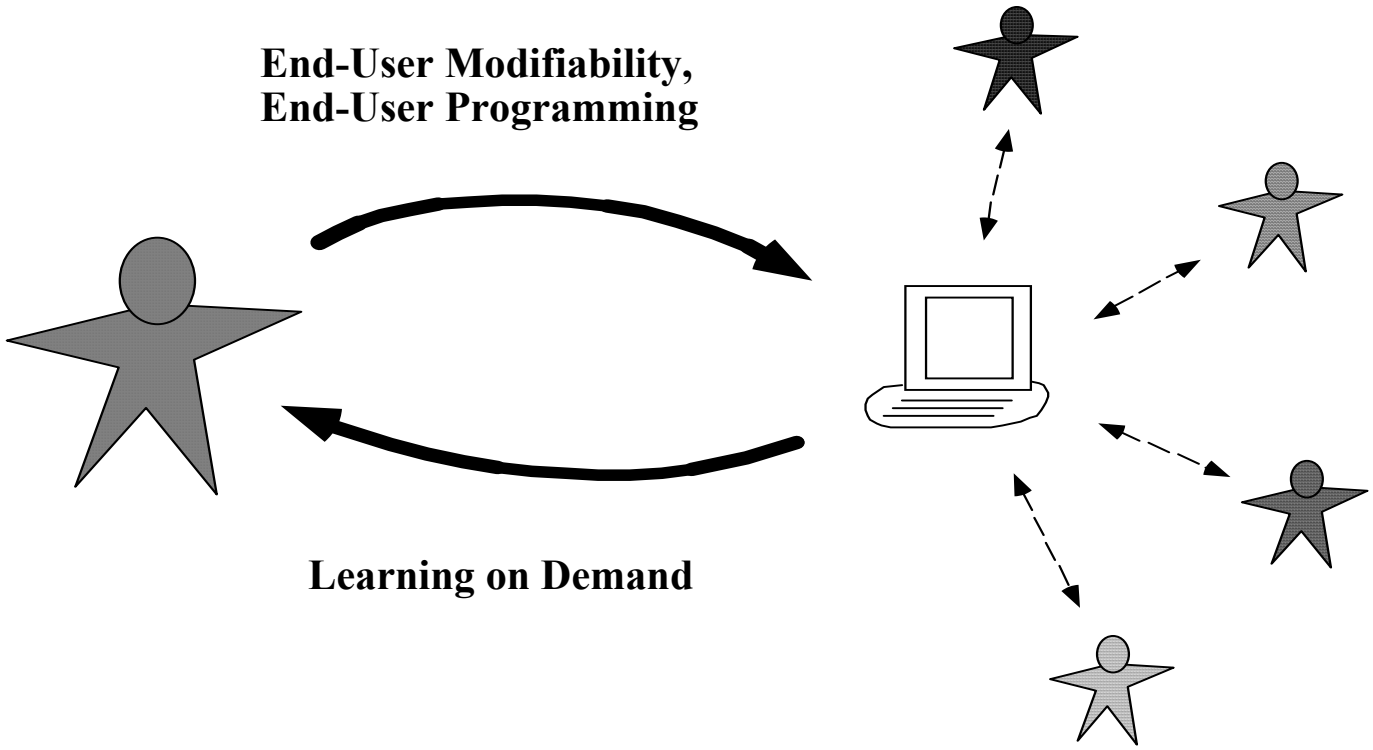
Broadcast with Feedback



M3

Evolutionary and Collaborative Design

Duality between Learning and Contributing



Consumers / Designers ←→ Social Creativity

- a designer culture is a necessary, but not a sufficient condition/requirement for social creativity

- Unproven Claims (Brown, J. S. (1991) "Research That Reinvents the Cooperation," Harvard Business Review, Jan/Feb 1991, pp. 102-111)
  - p 106: “technology will become so flexible that users will be able to customize it ever-more precisely to meet their particular needs — a process that might be termed “mass customization”
  - p 108: “provide people with easy-to-use programming tools so they can customize the information systems and computer applications that they work with”

- high-tech scribes: putting owners of problems in charge → unself-concious culture of design:
  - computing today: the world is separated into a population of elite scribes and a much larger population of intellectually disenfranchised computerphobes (similar to the written word before the printing press)
  - people can not do what they want until they get the attention of an expert who will tell them how they can do it

Social Creativity: Only possible among Humans with a Designer Mindset?

- "collective comprehensiveness through overlapping patterns of unique narrowness" → Campbell, D. T. (1969) "Ethnocentrism of Disciplines and the Fish-Scale Model of Omniscience." In M. Sherif & C. W. Sherif (Eds.), *Interdisciplinary Relationships in the Social Sciences,* Aldine Publishing Company, Chicago, pp. 328-348.

- "none of us is as smart as all of us" → Bennis, W. & Biederman, P. W. (1997) Organizing Genius: The Secrets of Creative Collaboration, Perseus Books, Cambridge, MA.

"Linux was the first project to make a concious and successful effort to use the entire world as a talent pool" → Raymond, E. S. & Young, B. (2001) The Cathedral and the Bazaar: Musings on Linux and Open Source by an Accidental Revolutionary, O'Reilly & Associates, Sebastopol, CA.

Meta-Design

- **meta-design =** how to create new media that allow users to act as designers and be creative (→ "underdesign" — example: American constitution)

- **why meta-design?**
  - design as a process is tightly coupled to use and continues during the use of the system
  - address and overcome problems of closed systems
  - transcend a "consumer mindset"

- **impact of meta-design**
  - *"if you give a fish to a human, you will feed him for a day — if you give someone a fishing rod, you will feed him for life" (Chinese Proverb)*

  - can be extended to: *"if we can provide someone with the knowledge, the know-how, and the tools for making a fishing rod, we can feed the whole community"*

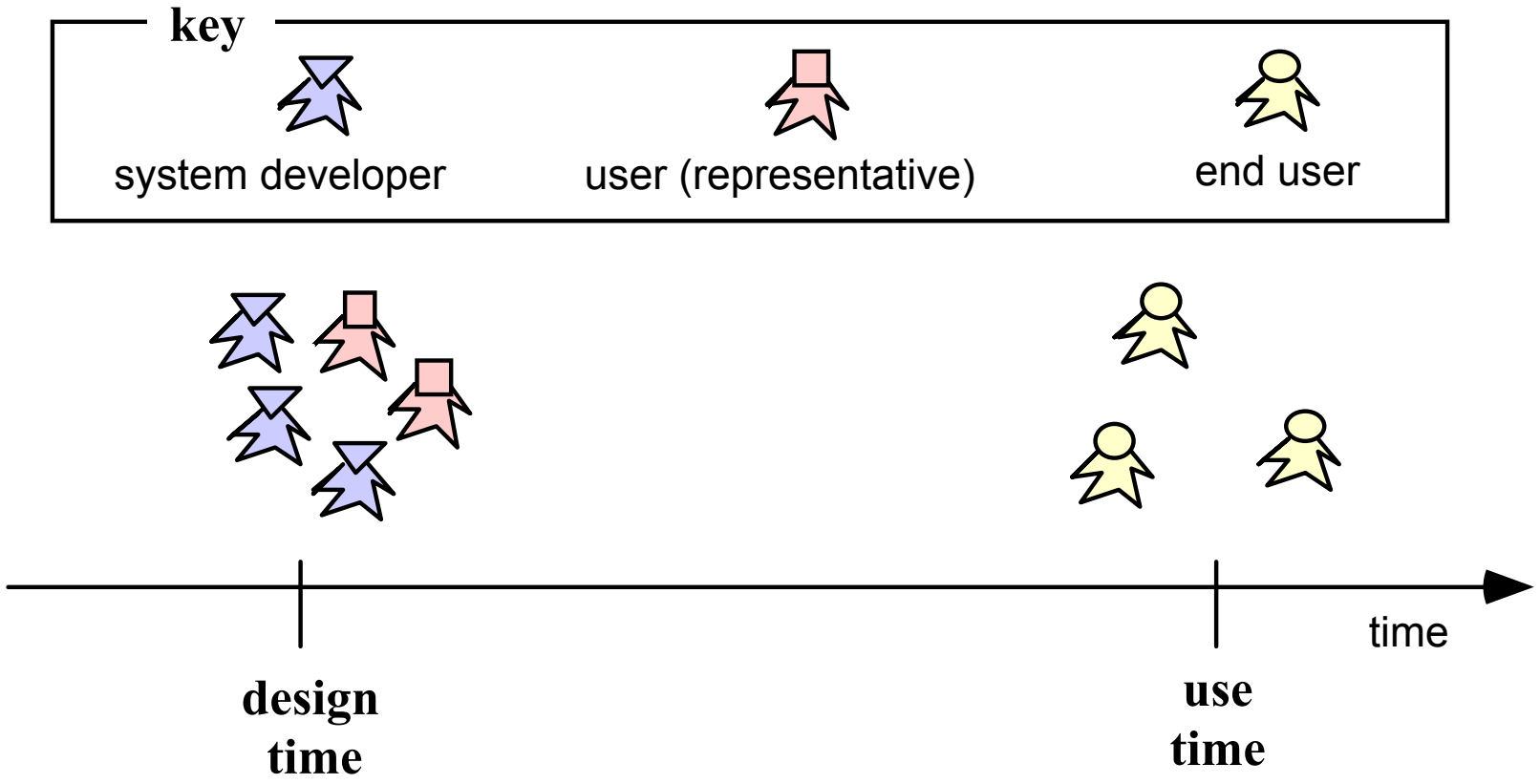
Meta-Design Aspects in the EDC: Closed versus Open Systems

- **user control:**
  - end-user modifiability
  - conviviality (independence of high-tech scribes)
  - ownership (putting owners of problems in charge)

- **example for a closed system: SimCity —** too much crime
  - solution supported: build more police stations (fight crime)
  - solution not supported: increase social services, improve education (prevent crime)

- **important goal of EDC:**
  - create end-user modifiable versions of SimCity
  - background knowledge can never be completely articulated because the world changes

Design and Use Time



Difference between Printed and Computational Media

Consumer <----------> Designer

TV

Printed Media

Current Computational Media

Envisioned Computational Media

- **print media:** a *fixed* context is decided at design time
- **computational media**: decision at use time can take advantage of contextual factors only known at use time (e.g., dynamic forms, dynamic websites, ...)
- **challenge:** articulation of contextual factors at use time (about tasks, users, social systems,.....) — end-user programming, specification sheets, usage data, ...

Meta-Design: Beyond Participatory Design

- **design for change** → seeding, evolutionary growth, reseeding (SER) model

- **"underdesign"**
  - create opportunities for design at use time
  - create design opportunities rather than design solutions

- **participatory design among CoIs** → use their own creativity to create environments (at design time) in which users can be creative and act as designers (at use time)

The Ubiquity of the Consumer/ Designer Perspective

- **learning and education**
  - **deschooling society (Illich):** "schools and universities = reproductive organ of a consumer society" and "people who are hooked on teaching are conditioned to be customers for everything else"
  - **courses as seeds** (rather than finished products) become a viable concept

- **concerned citizens:** "taking control of our lives" → Envisionment and Discovery Collaboratory
  - computational environments and reality should not be build by experts, with everyone merely interacting with it
  - "*limited technical acumen*" → is not a trait determined by someone's DNA like eye color; it is a convenient label employed by those who do not wish to expand the energy to enrich the technical acumen of their community

Motivation and Rewards

- what will make humans want to become designers/active contributors over time? → claim: serious learning does not have to be unpleasant but can be personally meaningful, empowering, engaging and fun

- what will make humans want to share? → requires: culture change, community knowledge bases, distributed memories

- who is the beneficiary and who has to do the work?

Mismatch Problem in Teaching and Learning

Teacher	Student	Example
authority ("sage on the stage") **{expert, teacher-run}**	dependent, passive **{consumer}**	lecture without questions, drill
motivator and facilitator	interested	lecture with questions, guided discussion
delegator	involved	group projects, seminar
coach/critic ("guide on the side") **{meta-designer}**	self-directed, discovery-oriented **{designer, student-run}**	self-directed study group, apprenticeship, dissertation

- **major mismatches :**
  - dependent, passive learners take courses with non-directive teachers, and
  - self-directed, discovery-oriented active learners take courses with directive, authoritarian teachers.

Assessment

- **role of professional designers**
  - division of labor
  - claim: the “average” person does not want to build their own houses, design their own car, write their own software system / sorting routine
  - all people do not have the time to participate equally fully in all aspects of the political system in order to become fully engaged and informed
    → intermediaries

- **users as designers**
  - one of the major roles for new media and new technologies is not to deliver information to individuals, but to provide the opportunity and resources for social debate and discussion
  - a departure from HCI thinking → to look at users not simply as objects of study, but as active agents within the design process itself
  - full participation from users →requires training and active cooperation, not just token representation in meetings or on committees

Conclusions

- differentiate between consumers and designers by **questions asked / problems perceived:**
  - ***Consumer***: Is a new future coming? (for example: in developing the new media of the future, the social scientists / humanists should not be content with spectators and Cassandra roles)
  - ***Designer***: How can we invent and create a new future?
  - being a consumer or a designer is a ***mindset***

- **Claims**:
  - the future is not out there to be "discovered", but it has to be ***invented and designed***
  - the question: ***who*** will design the future? (we should not be content with reflecting on and evaluating designs developed by other communities, e.g., Hollywood)
  - Marshall McLuhan: "If we understand the revolutionary transformations caused by new media, we can anticipate and control them; but if we continue in our self-induced subliminal trance, we will be their slaves."