



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 Long Tail Framework: Understanding, Fostering, and Supporting Interest-Driven and Passion-Based Learning

Gerhard Fischer  
Center for Lifelong Learning & Design (L3D)  
University of Colorado, Boulder  
<http://l3d.cs.colorado.edu/~gerhard/>

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# Overview

- Core challenge
- Long Tail in Business
- Long Tail in Learning and Education
- Examples / Narratives
- Cultures of Participation
- Meta-Design
- Drawbacks
- Conclusions

# The Core Challenge of my Professional Life

to create socio-technical environments (a design activity) in which people of all ages (lifelong learning)

**want to learn**

rather than

**have to learn**

# The Long Tail

- **source: Chris Anderson**

- Anderson, C. (2004) "The Long Tail," Wired, 12(10).
- Anderson, C. (2006) The Long Tail: Why the Future of Business Is Selling Less of More, Hyperion, New York, NY.

- **theory of the Long Tail:** our culture and economy is increasingly shifting away from a focus on a relatively small number of **“hits”** (mainstream products and markets) at the head of the demand curve and toward a huge number of **“niches”** in the tail
- **unique opportunity for digital artifacts:** computer programs, movies, books, 3D models of buildings, .... → as the costs of production and distribution fall, there is less need to lump products and consumers into one-size-fits-all containers
- **hypothesis:** without the *constraints* of physical shelf space, restrictions to local markets and other bottlenecks of distribution, narrowly-target goods and services can be as economically attractive as mainstream fare

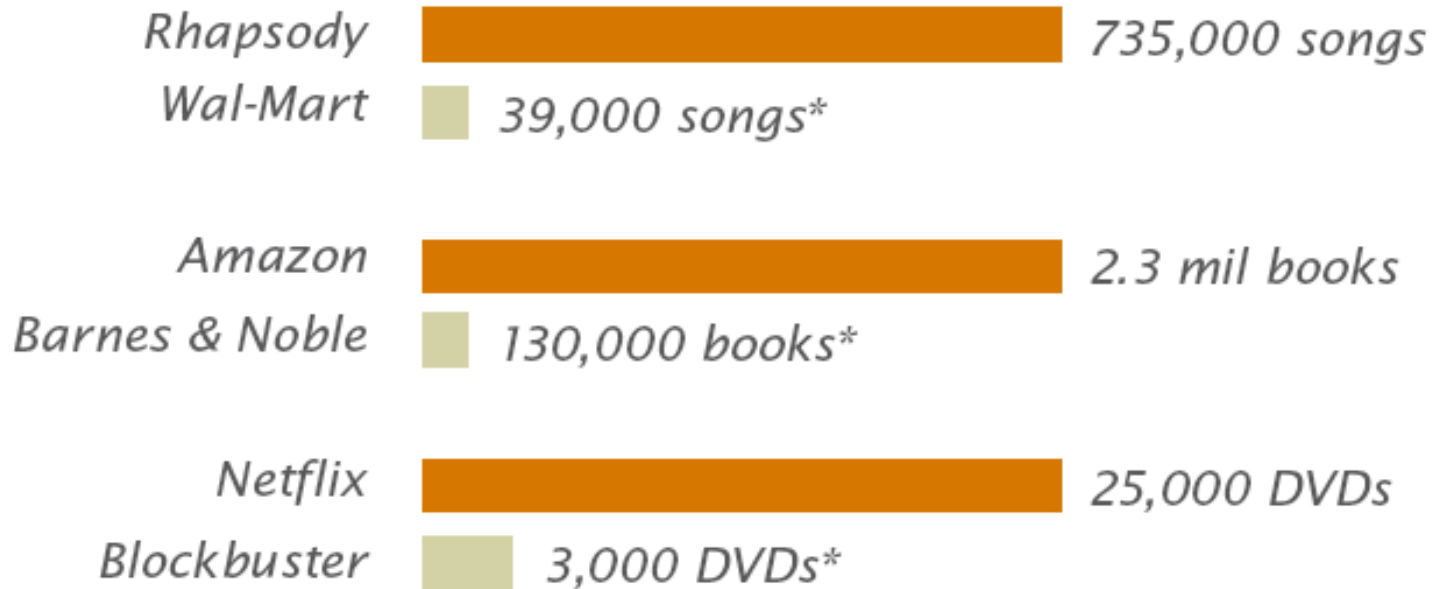
# Exploiting “Long Tail” Opportunities in Business



## Specific Examples of the Long Tail

### TOTAL INVENTORY

\* inventory in a typical store



# The Long Tail Framework in Learning and Education

- learn about **exotic but personally important topics** outside the mainstream education curriculum
- communicate with people who **share similar niche interests** anywhere in the world
- **contribute your own knowledge** to evolve and enrich living, open information spaces

# A Reinterpretation of the Long Tail for Learning and Education

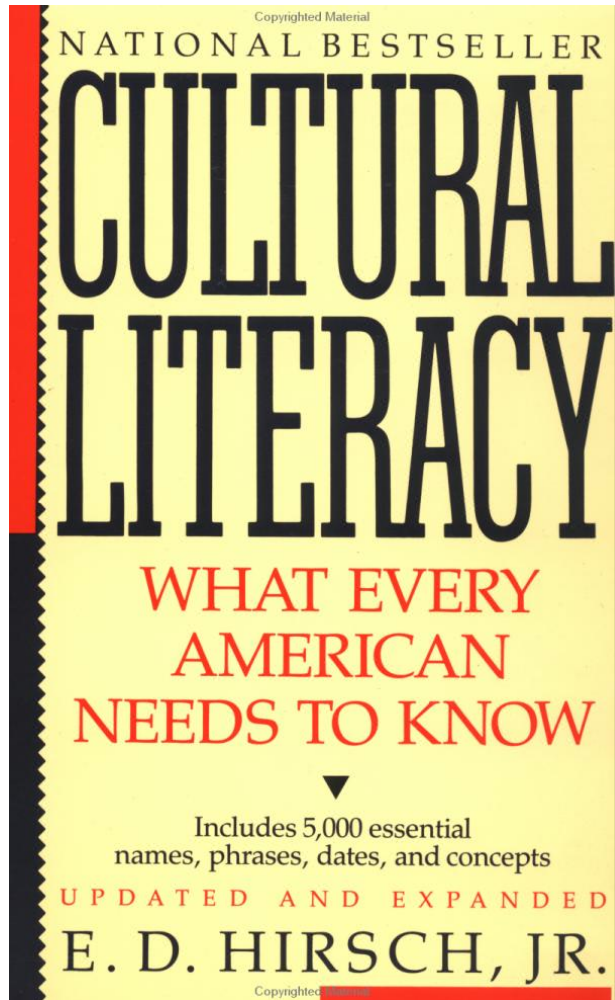
	<b>Web-Based Businesses</b>	<b>Learning and Education</b>
<b>Requirement</b>	Unlimited shelf-space	Unlimited knowledge
<b>Content of the head</b>	Megahits	Core curriculum
<b>Content of the tail</b>	Niche markets	Unique topics, niche communities
<b>Major limitation without support for the long tail</b>	Many interesting books, movies, songs will not enter the marketplace	Many interesting topics and ideas will not be taught in formal learning environments
<b>Coping with infinite choice and information overload</b>	Recommendation systems	User and task models to assist in asking questions and computing contextualized information and personalized learning paths
<b>Structures and interdependencies</b>	Individual objects are mostly independent	Prerequisite structures may exist



# A Long-Tail Interpretation for Learning and Education

- long-tail learning represents a **fundamentally different objective** to cultural literacy (Hirsch), No Child Left Behind, ....
- the **participatory Web 2.0** provides *unique possibilities for an educational interpretation of the “Long Tail”* thereby creating new feasibility spaces for learning
  - artifacts can be contributed by everyone → immense coverage (including exotic topics)
  - conventional learning environments (physical libraries with books, residential universities with limited course offerings) can not compete with coverage and updates

# The Other End: Cultural Literacy



## Example: Costume Play (“CosPlay”)

Shea is a young adult who has **developed a deep interest** in “*Cosplay*”, a type of performance art in which participants don costumes and accessories to represent a specific character or idea. Characters are often drawn from popular fiction in Japan, but recent trends have included American cartoons and sci-fi as well as other pop culture and role play.

Shea **spends a large amount of her free time working with a group of friends on designing and sewing their own costumes**. Much of their effort is focused on preparation for **special events** such as Nan Desu Kan (NDK), an annual anime convention (which has grown from 200 attendees in 1997 to 21,000 in 2010; see <http://ndkdenver.org/info>). This event provides an opportunity **to show off participants work and creativity** as well as to **socialize with and gain inspiration** from other Cosplayers, ranging from those who purchase their costumes to others who also design and create their own garb.

Shea’s interest began when she was a pre-teen—her social group became interested in anime, viewing Sailor Moon videos and subsequently role-playing Sailor Moon characters. This led to other activities such as **drawing new characters and costumes and writing their own stories**. Shea’s own interest in writing grew through these activities, with the additional impact that **her interest in history expanded** as she strove

to place some of her fictional stories in specific historical contexts and wanted to provide as much historical accuracy as possible.

## **Example: Costume Play (“CosPlay”) – Continued**

During college, Shea and her friends decided to put together her sewing skills and their design/sketching skills to create their own costumes, **beginning with simple attempts** for their first NDK. In subsequent years, **much more elaborate efforts** evolved into a year-round activity with a **weekly sewing night**.

To avoid being the critical path and becoming overworked with sewing, **Shea worked with her friends to teach them how to sew their own costumes**, especially as additional members joined the group and Shea migrated to more of an advisor on many of the individual projects.

In addition to sharing what happens at the events, there are **resources for Cosplay activities** such as the forums at <http://cosplay.com> and extensive information on sewing techniques at numerous Web locations. Much information was learned and shared at the peer level as well as with local resources, such as sewing and hobby stores.

# Being Passionate about Learning

**Source:** Fischer, G. (2005). "Computational Literacy and Fluency: Being Independent of High-Tech Scribes"

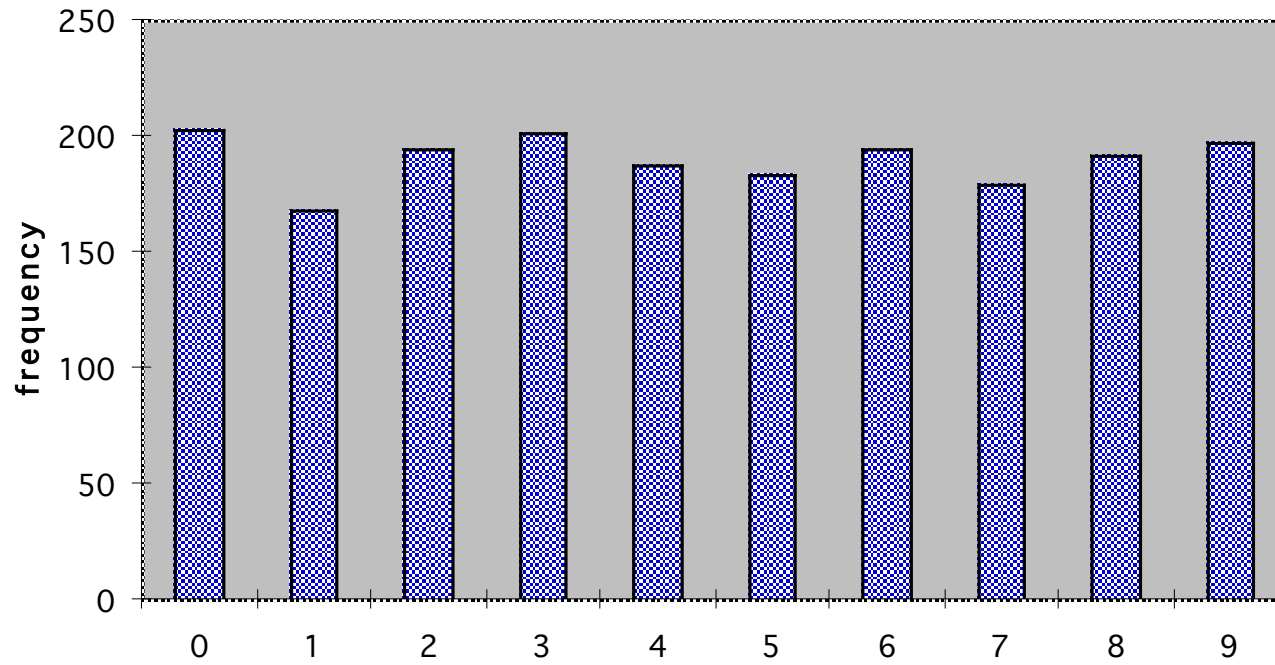
- **theme:** Computer-Generated Poetry (Tail) → Probability Theory (Head)
- **context:** course for gifted high-school students → student<sub>x</sub>: no interest in math
- **project:** computer-generated poetry
  - sentence structure: <article> <adj> <noun> <verb> <art> <noun>
  - noun: = "house mouse spouse ....."
  - use of a random number generator which returns values between 0 and 9
  - noun list contains 18 objects ----> student<sub>x</sub> uses: SUM RANDOM RANDOM

## A Computer-Generated Poem – Der Dumme Student

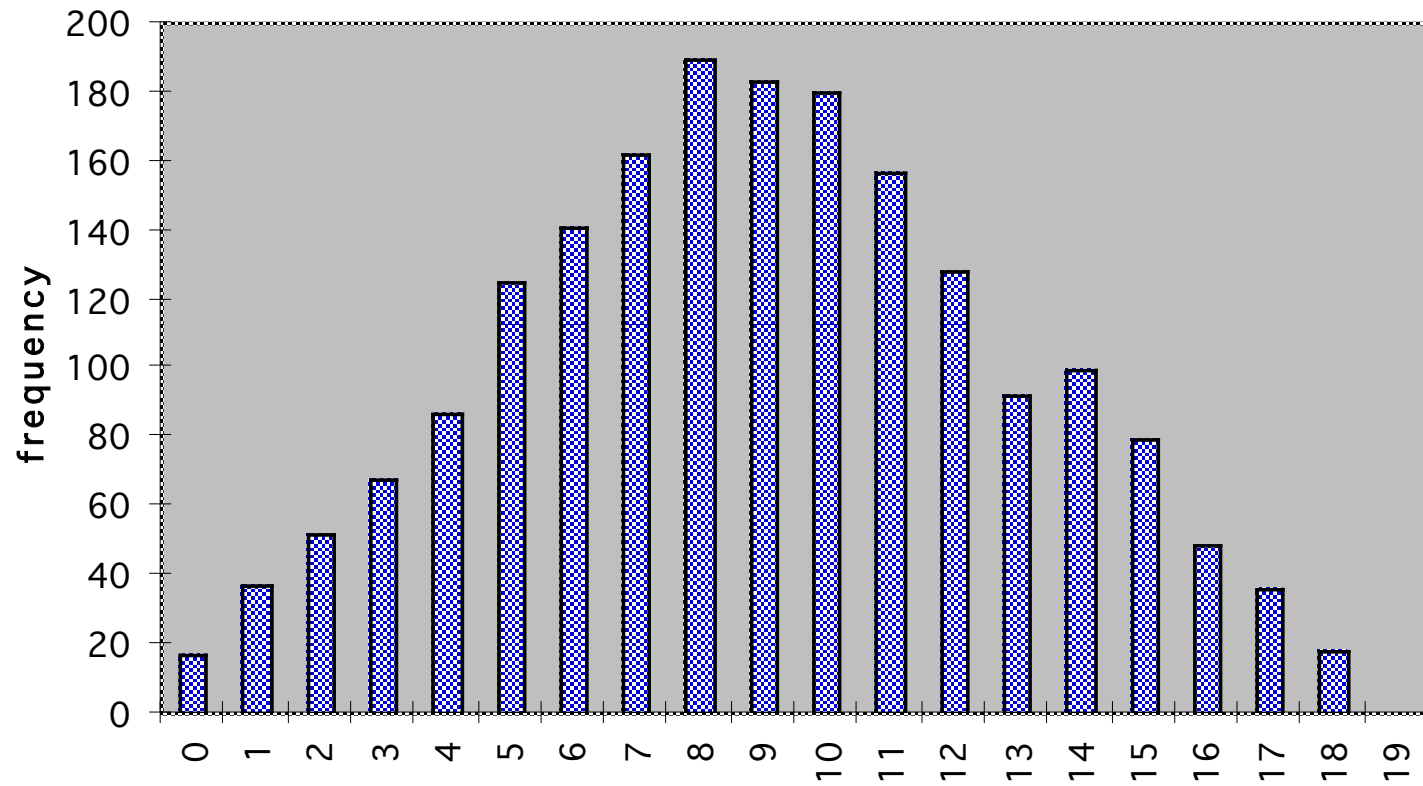
Das dumme Stubenmaedchen verflucht die Schlampe  
das lustige Kindermaedchen verbrennt keine Pampe  
jedes kluge Maedchen ionisiert den Tresen  
ein verschrumpeltes Maedchen verbrennt das Wesen  
kein ausgereifter Professor kocht den Wurm  
kein aufgespiesster Student besteigt den Turm.

Der kleine Hausmeister elektrisiert einen Ball  
jedes schweinslederne Maedchen seziert einen Knall  
der gefriergetrocknete Bergsteiger erfreut das Bier  
jede erdrosselte Jungfrau untersucht einen Stier  
ein kleiner Computer massakriert jede Flasche  
jeder erdrosselte Mann bearbeitet die Asche.

# Random 0 to 9

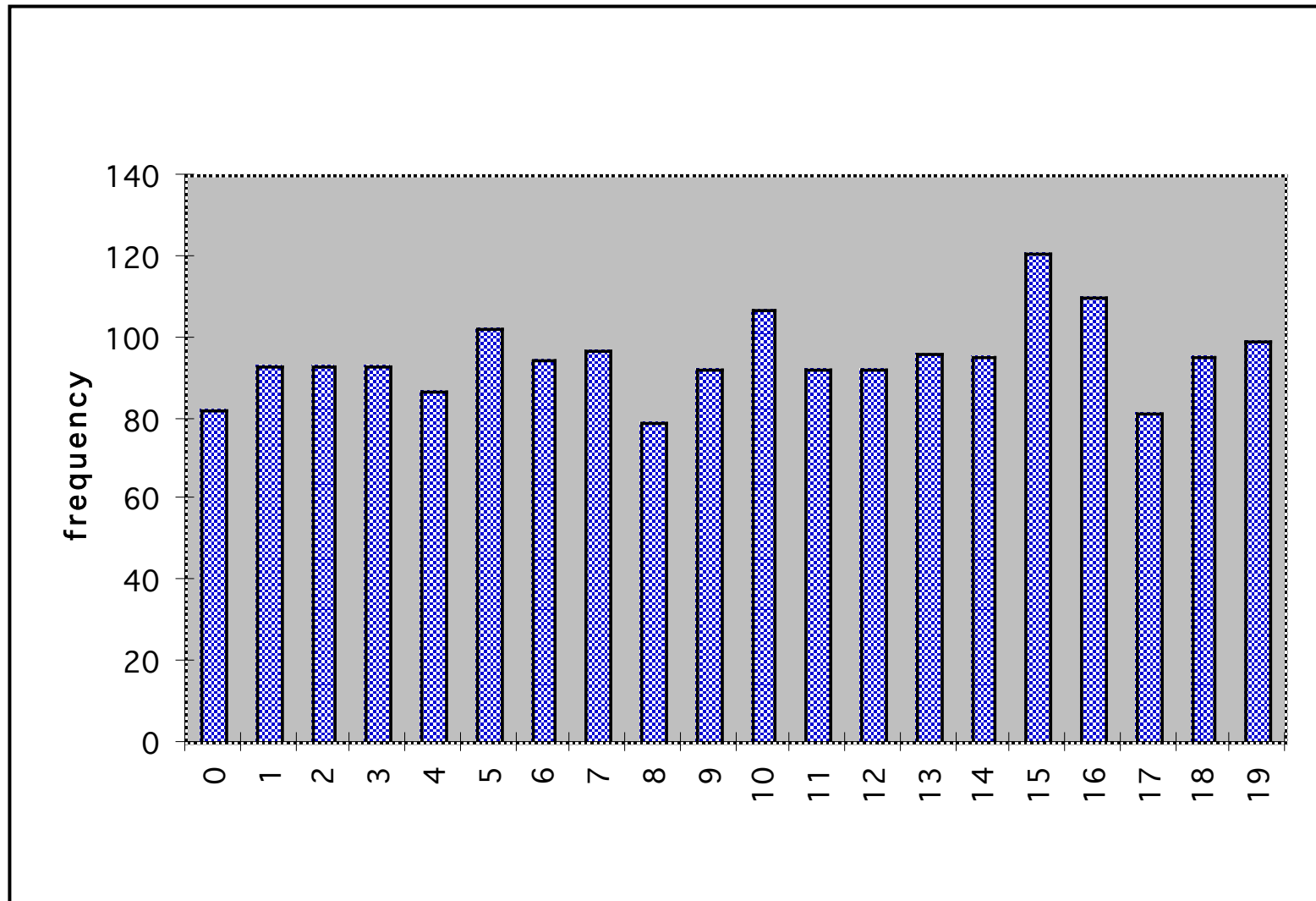


# Sum of Random and Random





# Word of Random and Random



## Lessons to Be Learned from the Story

- student<sub>x</sub> learned some aspects of probability theory grounded in a self-directed learning activity
- provide opportunities which change people's lives
  - intrinsic motivation is crucial
  - “falling in love” with something → student<sub>x</sub> ended up studying computer science
- “normal” learning experience: learners work hard because they **have** to (extrinsic motivation)
- our goal: learners work hard because they **want** to (intrinsic motivation)

## Some of our Basic Beliefs

- **Internet / cyberinfrastructure** is the Long Tail of idea spaces or cultural spaces
  
- most people are **interested / feel passionate about something** (which maybe be very idiosyncratic, locally sparse, but world-wide there maybe still some niche communities) → *examples*:
  - astronomy, casino games, Viking Ships. Model trains
  - urban planning, 3D models, open source
  - wines, jewelry, carpets
  - books (The Magic Mountain, Stieg Larsson, .....)
  - movies (The White Rose, Igmar Bergman “The Silence”, October Sky, .....)
  - Warren Miller’s ski movies (high production value) ↔ my ski movie (personal) — both on YouTube
  
- people are re-forming into **thousands of cultural tribes of interest**, connected less by geographic proximity than by shared interest

# Exploiting the “Long-Tail” in Learning and Education

- a **new synergy and hybrid model**: integrate basic knowledge and skills and idiosyncratic interests and passion
  
- **basic knowledge and skills** — *head* of the long-tail
  - learning to learn
  - learning on demand
  - preparation for future learning
  - soft skills, .....
  
- **idiosyncratic interests and passion** — *tail* of the long-tail
  - - interest and passion
  - - self-directed learning and intrinsic motivation
  - - personally meaningful problems
  
- **extensive coverage** needed for supporting the infinite numbers of interesting topics → will be facilitated
  - meta-design
  - cultures of participation

# Cultures of Participation

## *consumer cultures*

**focus:** produce finished goods to be consumed passively



## *cultures of participation*

**focus:** provide all people are with the means to participate actively in personally meaningful problems

**impact:** democratizing innovation, enhancing (social) creativity, giving all people a voice, end-user development, instantiating Model Democratic

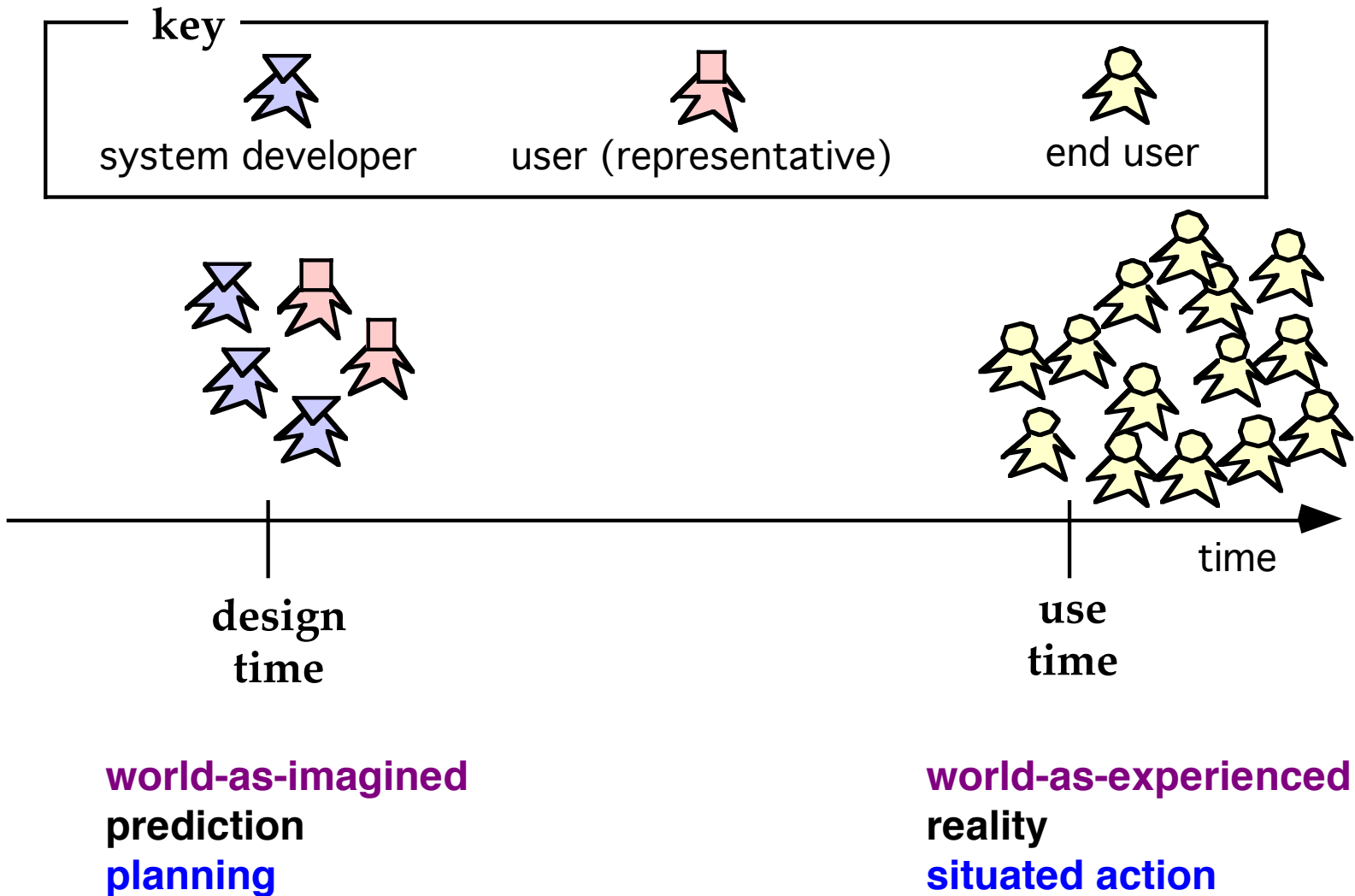
# Environments Created by Cultures of Participation

Site	Objectives and Unique Aspects
<b>Wikipedia</b>	web-based collaborative multilingual encyclopedia with a single, collaborative, and verifiable article; authority is distributed ( <a href="http://www.wikipedia.org/">http://www.wikipedia.org/</a> )
<b>KNOL</b>	a library of articles by recognized experts in specific domains; authors take credit and elicit peer reviews; readers can provide feedback and comments; authority rests primarily with the author ( <a href="http://knol.google.com/">http://knol.google.com/</a> )
<b>iTunes U</b>	courses by faculty members from “certified institutions”; control via input filters; material can not be remixed and altered by consumers ( <a href="http://www.apple.com/education/itunes-u/">http://www.apple.com/education/itunes-u/</a> )
<b>YouTube</b>	video sharing website with weak input filters and extensive support for rating ( <a href="http://www.youtube.com/">http://www.youtube.com/</a> )
<b>Encyclopedia of Life (EoL)</b>	documentation of the 1.8 million known living species; development of an extensive curator network; partnership between the scientific community and the general public ( <a href="http://www.eol.org/">http://www.eol.org/</a> )
<b>SketchUp and 3D Warehouse</b>	repository of 3D models created by volunteers organized in collections by curators and used in Google Earth ( <a href="http://sketchup.google.com/3dwarehouse/">http://sketchup.google.com/3dwarehouse/</a> )

## Environments Created by Cultures of Participation

<b>Scratch</b>	Learning environment for creating, remixing, and sharing programs to build creative communities in education ( <a href="http://scratch.mit.edu">http://scratch.mit.edu</a> )
<b>Instructables</b>	socio-technical environment focused on user-created and shared do-it-yourself projects involving others users as raters and critics ( <a href="http://www.instructables.com/">http://www.instructables.com/</a> )
<b>PatientsLikeMe</b>	collection of real-world experiences enabling patients who suffer from life-changing diseases to connect and converse ( <a href="http://www.patientslikeme.com/">http://www.patientslikeme.com/</a> )
<b>Ushahidi</b>	tools for democratizing information, increasing transparency and lowering the barriers for individuals to share their stories; originated in the collaboration of Kenyan citizen journalists during crises ( <a href="http://www.usahidi.com/">http://www.usahidi.com/</a> )
<b>Stepgreen</b>	library of energy saving actions, tips, and recommendations by citizen contributors for saving money and being environmentally responsible ( <a href="http://www.stepgreen.org/">http://www.stepgreen.org/</a> )

# Meta-Design: Design for Designers

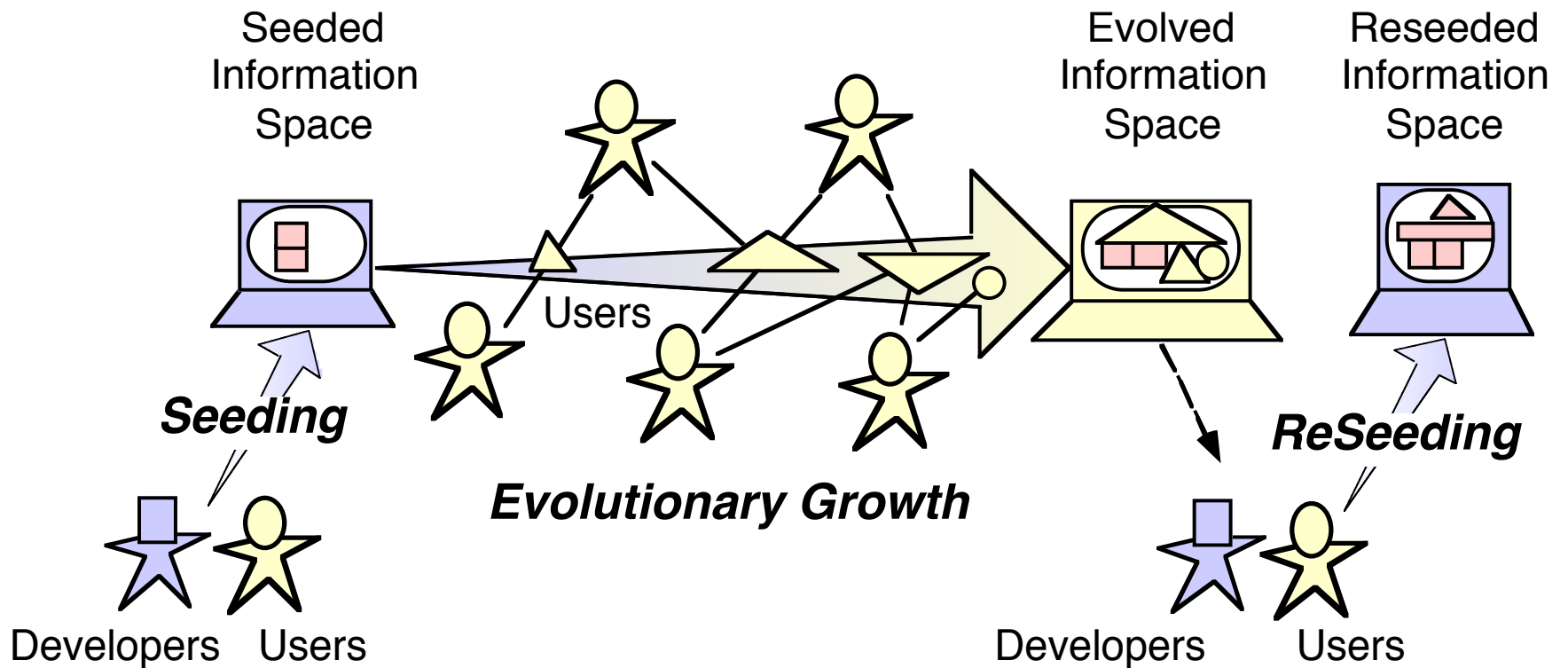




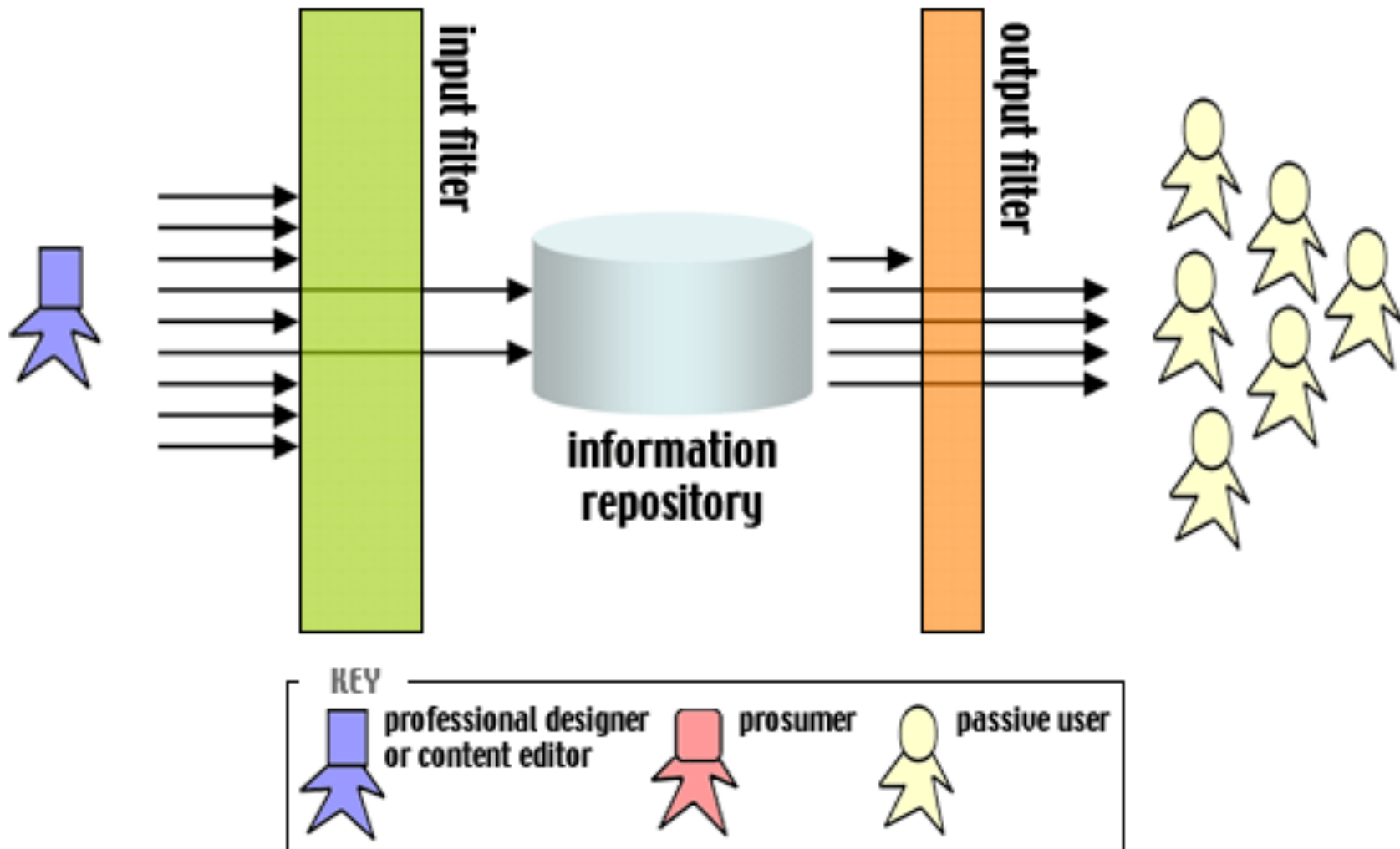
# Models

- seeding, evolutionary growth and reseeded (SER)
- authoritative versus democratic models of knowledge accumulation, sharing, and dissemination
- **courses-as-seeds** = self-application to my own teaching activities  
<http://l3d.cs.colorado.edu/~gerhard/courses>

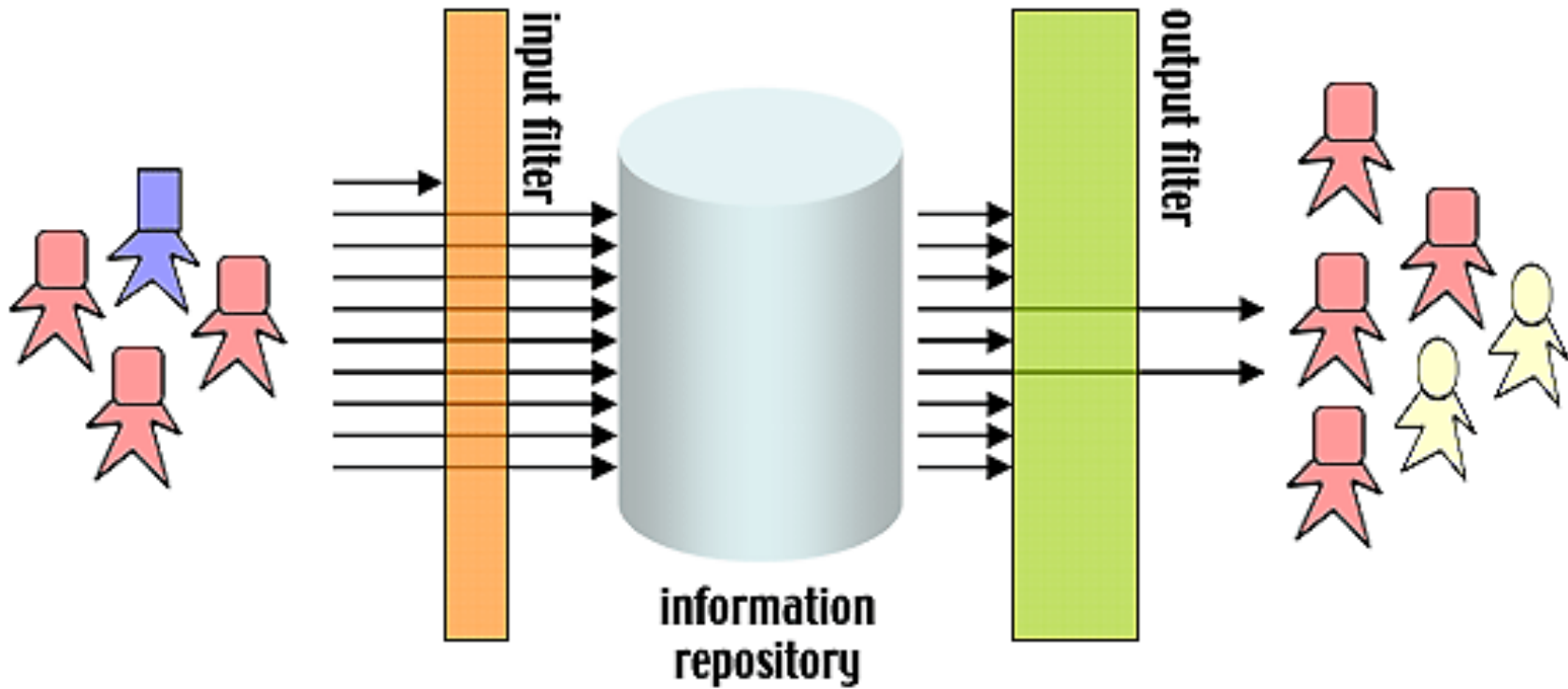
# The Seeding, Evolutionary Growth, Reseeding (SER) Model



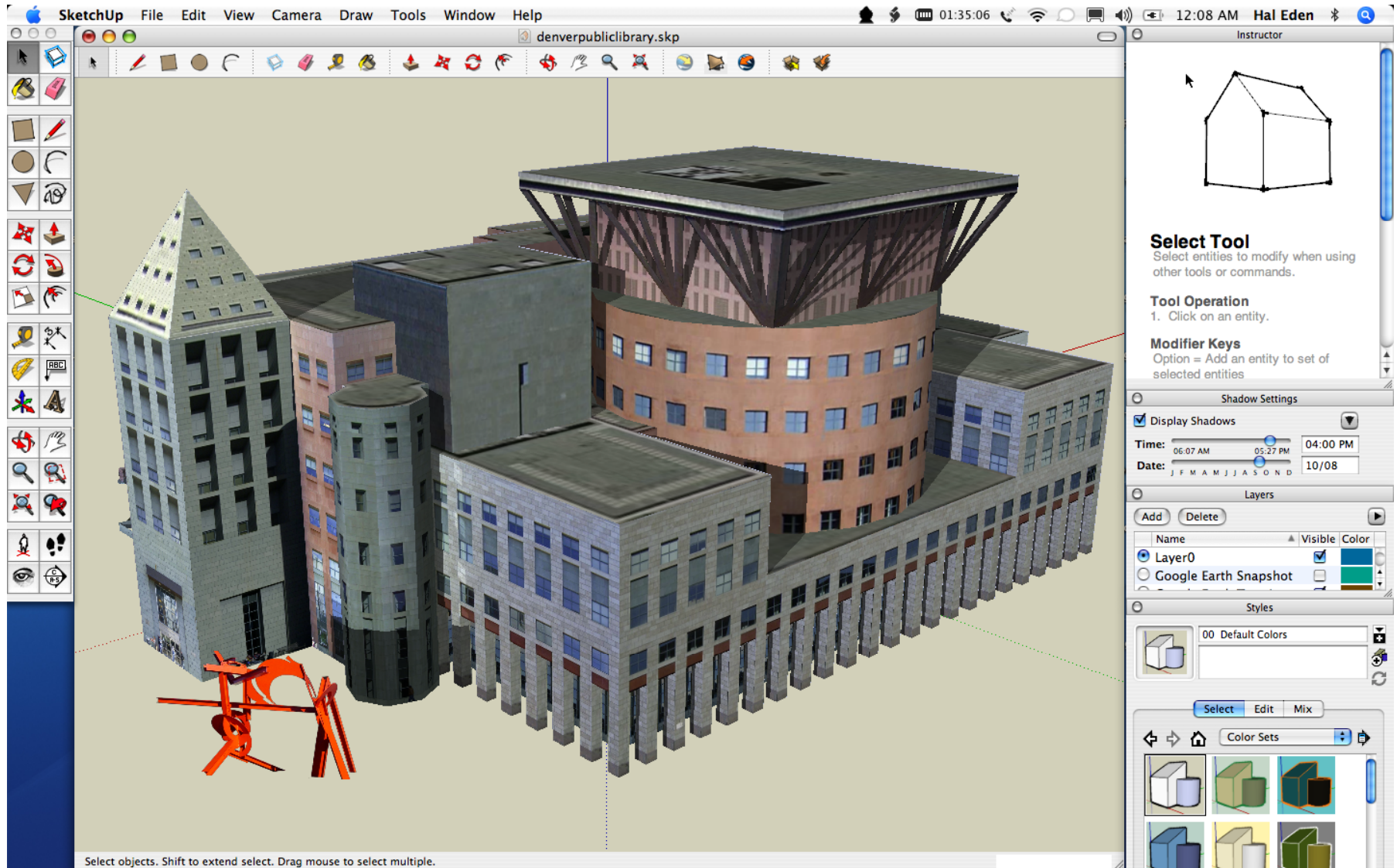
## Model Authoritative underlying Consumer Cultures



# Model Democratic underlying Participation Cultures



# SketchUp — a 3D Modeling Environment for Content Creation



# 3D Warehouse

## 3D Building Collections



[Featured Google Earth Modelers](#)



[Help Model a City](#)



[Featured Google Earth Collections](#)

## Featured Collections



[Google Earth - Ocean Layer](#)



[SketchUp Components](#)



[Interior Furnishings](#)

## Popular Models



[Egg Chair](#)  
by [Mart](#)



[Chair](#)  
by [Yeroc](#)



[People](#)  
by [Graphic Sketchbook](#)



# Downtown Denver in 3D





# A Tiny Percentage of a Huge Population → Large Number of Participants

<http://sketchup.google.com/3dwarehouse/modelcycle?scoring=d>





# Castles in Northern Germany – One Example from the Tail of the Long Tail Distribution in the 3D Warehouse



## [Bergedorfer Castle](#)

by [picturemaker](#)

In Hamburg in the middle of a...

[History](#)

[View in Google Earth](#)

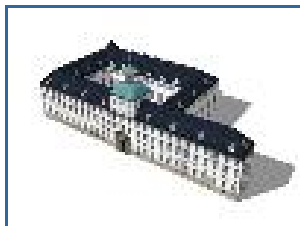


## [Schloss Richmond](#)

by [der Uhlenbusch](#)

Schloss Richmond wurde...

[View in Google Earth](#)



## [Gottorp Castle - Schleswig -](#)

...

by [JWagner](#)

The Gottorp Castle in...

[View in Google Earth](#)



## [Schloss \(Schlossmuseum\)...](#)

by [Projekt-Oldenburg](#)

mehr folgt.....

[View in Google Earth](#)



### ▪ the current environment:

- 14 models (4 of them show below)
- contributed by: 6 contributors
- the owner of the collection serves as curator

# Assessment: Long-Tail in “Business ≠ Learning/Education”

## ▪ **business:**

- the success or failure of an item in the tail does not depend on which items are in the head
- items in the tail can become items in the head

## ▪ **learning/education:**

- there are dependencies among the items
- certain items must be in the head before others can get into the tail → some items in the tail of the distribution cannot be dealt with unless the head contains the ability to read or to do basic math

## ▪ **claim: the process that generates the Long Tail distribution in the two cases is different:**

- business: **independence**
- learning/education: **dependence** → supporting tail activities requires attention to what is in the head

# Exploring Drawbacks of the Long Tail Framework

- Under which conditions is a ***fragmented culture*** (with numerous idiosyncratic voices representing a modern version of the “Tower of Babel”) better or worse for enhancing learning?
- If all people can contribute, how do we assess the ***quality*** of the resulting artifacts?
- Will we drown in **irrelevant information**?
- **loss of individuality** → devaluation of the unique, responsible, engaged individual as the core element of a system of information, knowledge, and culture

## Questions for Further Research

- How can we envision a **productive synergy** between the head and the tail and create mechanisms to support and exploit this synergy?
- What will **motivate** stakeholders to become active contributors?
- What is the role of **trust, empathy, altruism, and reciprocity** in such an environment and how will these factors affect learning?
- What are the unique challenges associated with **privacy issues** (e.g.: the use of learner and task models needed to compute personalized learning path and zones of learnability)?
- Do we want to keep requiring everyone to learn the same thing in school rather than **pursuing their deep interests**?
- Which **support** can be provided for letting people pursue their deep interest?

# Conclusions

- **Long Tail framework in learning and education**
  - a paradigm shift (enabled by exploiting cyber-enabled infrastructures)
  - representing different and complementary objectives to cultural literacy (based on curriculum-driven learning)
  
- **focus: allowing learners of all ages to**
  - learn about exotic but personally important topics outside the mainstream education curriculum
  - communicate with people who share similar niche interests anywhere in the world
  - contribute your own knowledge to evolve and enrich living, open information spaces
  
- a promising alternative for creating socio-technical environments in which people **want to learn** rather than **have to learn**