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**

Designing the Information Society of the New Millennium

**Ernesto Arias & Gerhard Fischer
and
Andy Gorman, Rogerio de Paula & Eric Scharff**

**A Course in the ATLAS "Technology, Arts and Media" Certificate Program
Spring 2000**

ATLAS: Alliance for Technology, Learning and Society

http://www.colorado.edu/ATLAS/

rationale for certificate program:

- the rapidly evolving inter-relationships among technology, media and the arts are transforming the ways in which humans inform, influence and entertain each other. The effects of these dramatic transformations are felt in a variety of spheres: economic development, creative design and delivery of content, and the practices of everyday life through which citizens acquire information for a meaningful life.

- the Certificate program will provide a flexible structure for students to question and theorize the convergence of technology, media and the arts. It will also help them to develop the practical and critical thinking skills required for effective participation in this brave new world. The program will be available to undergraduates from any university discipline and will encourage all interested undergraduates to become active participants in the interdisciplinary arena of technology, arts and media.

- **what the certificate program is not:** CU's role as a university is not to provide trade-school training that students can get more effectively someplace else (e.g.: "Photoshop / HTML / …. for Dummies")

Objectives of the Course

- The course will explore the information society of the "next / new" millennium, and how new media will impact and can be shaped by professionals and citizens?

- Students will have the opportunity to learn and to discuss that the future is not out there to be discovered, but has to be designed and invented — and that they can and should play a meaning part in this process. An understanding will be created that the future will be different from the past but that at the present there is really no consensus as to how technological innovation in information and communications will affect the shape of our society in the next millennium.

- The course will represent an opportunity to rethink learning and the framing and solving of problems through new approaches. It will allow students to engage in authentic, self-directed learning activities, and embed learning and design activities in the context of real world activities.

- To account for the interdisciplinary nature of real world problems, we will encourage students with different background knowledge, from a variety of disciplines, and from different educational backgrounds to participate.
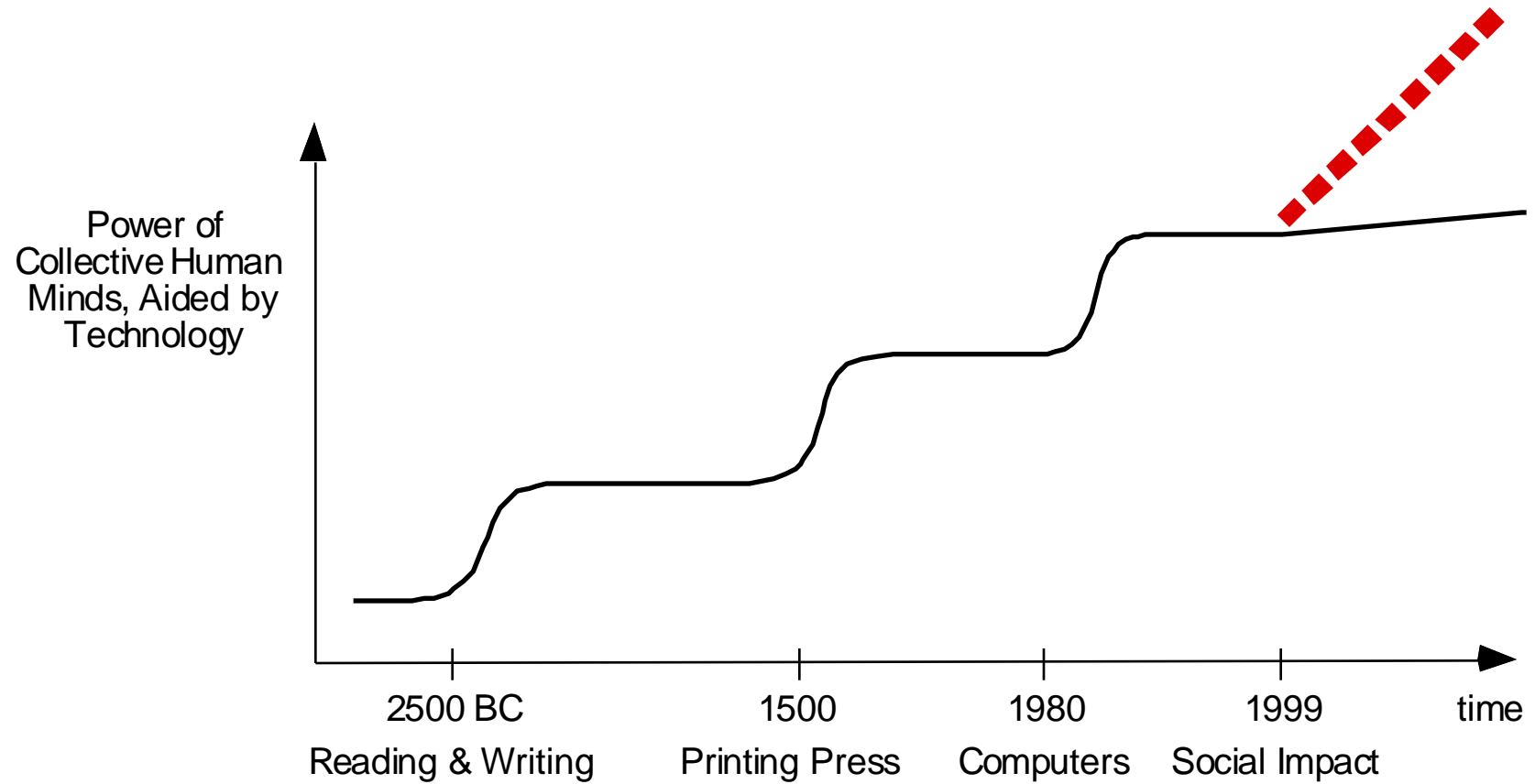
New Media and New Technologies

- "A technology is to a medium what the brain is to the mind. Like the brain, a technology is a physical apparatus. Like the mind, a medium is a use to which a physical apparatus is put." (Neil Postman, Conscientious Objections, p 104)

- fundamental new media: computational media (software)
    - a medium for creating virtualities
    - a medium to create cognitive artifacts

- computational objects are grounded in other worlds, but also create a world of their own

- software is not just a device with which users interact; it is the generator of spaces in which users "live"

- design always implies a medium of construction, and new technologies bring with them new domains for design → examples: Envisionment and Discovery Collaboratory, Hypergami
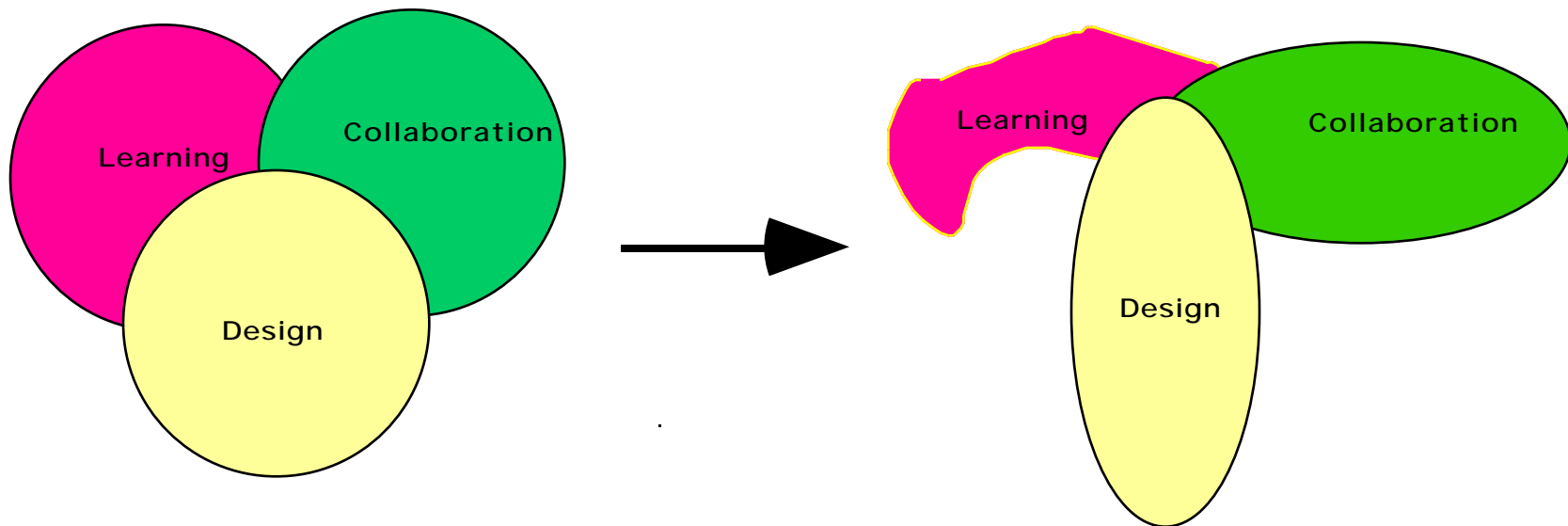
Thinking, Learning, and Working —The "Wrong" Image?

The Aided, Collective Human Mind — Exploiting the Social

Power of Collective Human Minds, Aided by Technology

2500 BC	1500	1980	1999	time
Reading & Writing	Printing Press	Computers	Social Impact	

Intersection of Design, Learning and Collaboration and their Changing Nature through New Media

The Strength and Weaknesses of Physical Media

Strengths of Physical Media	Weaknesses of Physical Media
direct, naive manipulability	models are passive; incapable of changing representation without intervention by users
intuitive understanding	behavior cannot be associated with physical objects
tactile interaction	no support for simulation and critiquing
mediation of communication and social interaction	feedback on the consequences of a decision is not provided
relative high fidelity to reality	fidelity to reality is limited due to problems such as scaling
looking provides valuable information	no support for management of large amounts of information

Myths and Misconceptions Associated with New Media

- computers by themselves will change education

- information is a scarce

- content / value / quality of information and knowledge is improved just because it is offered in multi-media or over the WWW

- "ease of use" is the greatest challenge or the most desirable goal (instead of low threshold and high ceiling, engagement, affection, personal relevance)

- the single or most important objective of computational media is
    - reduce the **cost** of education
    - increase the **quality**
    - we need to resolve the paradox between economical realities and educational objectives

New Learning Experiences:
Changing Current Practices in our Universities

- lecture dominated — emphasizing passive knowledge absorption instead of active knowledge construction

- curriculum dominated — little room for authentic, self-directed learning activities

- students solve given problems (and do not learn to frame problems)

- problems have right or wrong answers

- closed book exams — ignoring distributed cognition

- little emphasis on collaborative learning and communication skills

Arts and Computers — Examples of L3D Projects

Systems	Authors / Users	Objectives
Schemepaint	Mike Eisenberg, Silke Haarer	direct manipulation and programming
Hypergami	Mike and Ann Eisenberg	computational crafts, integration of physical and computational worlds
ArtPals	Jim Ambach, Alex Repenning, Jim Johnson	active tools (---> ArtDwarfs; Frieder Nake et. al.)
eMMa	Kumiyo Nakakoji	color critiquing
Envisionment and Discovery Collaboratory	Ernie Arias, Gerhard Fischer, Hal Eden, Eric Scharff, Andy Gorman	integration of physical and computational worlds, open systems, contextualized information