

Human Futures for Technology and Education

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the tower and the cloud
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Brief Presentation Outline
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Every assumption I held about information has changed in the past 3 years, transformed by new information technologies available (web 2.0), yet we continue to teach with assumptions that are hundreds of years old, based in previous technologies (print).

“There is a world of difference between the modern home environment of integrated electric information and the classroom. Today’s child is bewildered when he enters the nineteenth century environment that still characterizes the educational establishment where information is scarce but ordered and structured by fragmented, classified patterns, subjects, and schedules.” - Marshall McLuhan 1967

He was talking about TV, and already there was talk of an INFORMATION AGE – that for the first time there was not too little information. There was too much.

By 13 years ago we thought we were truly awash in information as the Cable revolution had brought an even wider diversity of information networks into our homes.

It was 1994, and internet guru Kevin Kelly was meeting with ABC executives. He suggested they purchase the domain name, abc.com. He was politely shown the door. The web was not to be taken seriously.

That same year Time magazine ran a less than optimistic story on the internet. Newsweek followed in February 1995 with the headline, “The Internet? Bah!”

ABC produces a lot of information - 59 years since first television broadcast in 1948 - if they ran for 24 hours straight since that time that's over 500,000 hours of information.

YouTube has produced more hours of content in the past 6 months.

(without producers)

YouTube produces over 3250 hours of content every day.
The equivalent of 135 always on TV channels.
But it's not 135 24 hour channels
its 65,000 3 minute channels ...
and it comes in all types from all over the world – 91% of it is completely new

There are also
71 million blogs
almost 71 million more than there were in 2003.

But that doesn't even begin to uncover the amount of new information being produced.

There are over 60 BILLION e-mail messages sent each day

It's estimated that 40 exabytes (40 Billion Gigabytes) of unique new information will be generated worldwide this year.

That's more than the entire library of congress
... a LOT more ...
= 296,000 Libraries of Congress

That's over 6 Terabytes of information per person, representing a stack of books over 200 feet tall.

But that's just a metaphor

in reality less than .01% of the total will be produced on paper

And that's a big deal, because digital information is different than information on paper.

Rethink Information

Rethink Education

On Paper we thought information is a THING with a physical form with a specific logical place – that it can and should be categorized in strict hierarchies so it can be easily found later on.

The early web maintained this idea (Yahoo 1996)

Quality search engines like Google showed us the hierarchies were unnecessary. = 6.4 billion queries / month

HyperLinking showed us info could be in “more than one place at once” – and in fact question the idea of information being in a “place” at all

Blogging showed us that we could all create information.

Wikipedia showed us the information did not need to be produced by hired experts, or revised by professional editors.

A study in Nature in December 2005 found that Wikipedia was almost as good as Britannica, with 4 errors per article in Wikipedia and 3 errors per article in Britannica. But the real strength of Wikipedia is that all of those errors were fixed – in less than 30 days.

That was 2005. Now there’s no contest. By July of 2006 a fast reader reading 24 hours/day would be outpaced by the new content being added to Wikipedia.

1.8 million English articles, over 600 million words, 15x Britannica

7 million articles total, almost 2 billion words, 250 languages

282,874 contributors

Furthermore,

Tagging showed us we didn’t need professionals to categorize information for us ...
... that the actions of us together surfing the web and adding our own tags to data could organize the data while we surfed

And RSS taught us that information can find US rather than the other way around.

Information R/evolution Video (soon to be posted to YouTube)

And all of this has come to show us that the information of today is not the information of yesterday or tomorrow ... and so information is not really the point. Information producers are the point.

Back to YouTube ... What was Google buying for \$1.65 Billion?
The technology? No
The information? No

They were not buying the Tube. They were buying YOU.

And Time magazine got it right this time, naming the person of the year 2006: YOU.

Chorus: Have we prepared our students for this world?

Anthropology is the study of all people in all times in all places. So we are big picture people ... And I always like to start with the big picture ...

12,000 years ago everybody on the planet lived as gatherers and hunters. If we take the past 12,000 years and compress it into one hour this is what it would look like:

55 minutes ago (11,000 years) – the first harvest

25 minutes ago – the first significant towns and cities & writing

15 minutes ago – the first alphabet

3 minutes ago – the printing press

1 minute ago – the industrial revolution

51 seconds ago – the telegraph

41 seconds ago – the telephone

38 seconds ago – the automobile

14 seconds ago – TV

3 seconds ago – WWW

the last 5 seconds (the lifetime of our students):

Personal computers, mobile phones, www, Wal-Mart everywhere, exurbs

Current Conditions of Spaceship Earth (Buckminster Fuller's term)

- A Global Network of tremendous wealth and production BUT
 - 1.3 billion less than \$1/day
 - 3 billion less than \$2/day
 - 800 million undernourished
 - Over 27,000 children will die of poverty ... today
 - Over 1,000 ... before I finish this presentation
 - the power to destroy the earth almost instantaneously
 - Over 1 Billion people are now connected in a vast digital network
 - Almost as many remain illiterate

What will happen in the next 15 seconds? (the lifetime of our students)

- A list would almost be meaningless because it is not the changes themselves that are most significant but THE RATE OF CHANGE

Have we prepared our students for this world?

Does this clock keep ticking?

VIDEO: A Vision of Students Today (to be posted to YouTube soon)

Basic script of video:

My students (all 200 of them in an Intro class at KSU) and I created a Google Document to collaborate on the creation of a message we wanted to send out to all faculty. The results are as follows – spoken from the students perspective ...

* 51% of my classes use PowerPoint.

* My average class size is 115

- * 18% of my teachers
... know my name.
- * I am defined by numbers.
- * I complete 49% of the readings assigned to me.
- * only 26% seem relevant to my life.
- * I'll read 8 books this semester
- * 2,300 web pages
- * and 1,281 Facebook Profiles
- * I will write 42 pages for class assignments this semester
.... and over 500 pages of e-mail
- * I get 7 hours of sleep each night
- * I spend 1 1/2 hours watching TV each day.
- * 3 1/2 hours online. (12)
- * 2 1/2 hours listening to music. (14.5)
- * 2 hours on my cell phone. (16.5)
- * 3 hours in class (19.5)
- * 2 hours eating (21.5)
- * 2 hours working (23.5)
- * 3 hours studying (26.5)
- * That's a total of 26.5 hours.
- * I am a multi-tasker.
... I have to be.
- * I will be over \$20,000 in debt when I graduate.
- * I'm one of the lucky ones.
- * Over 1 billion people
.... make less than \$1/day
- * When I graduate I will probably have a job
... that may not exist today.
- * (holding scantron) Filling this out won't help me get there
... or help me deal with this (arrows out)
--- pollution, inequality, poverty, hunger, disease, war, conflict, job security,
healthcare, gender equality, ethnic conflict, equal rights, etc.
- * I didn't create the problems
... but they are my problems.

CAN TECHNOLOGY SAVE US?

- **Quotes ...**
 - "the inventor or introducer of the system deserves to be ranked among the best contributors to learning and science, if not among the greatest benefactors of mankind"
- Josiah F. Bumstead - 1841 - The Blackboard in the Primary Schools
 - "Books will soon be obsolete in schools ... Our school system will be completely changed in the next 10 years."
- Thomas Edison
1913
on the motion picture

- All this will bring a profound change in education. We will stop training individuals to be “teachers.” (the problems teachers address are” “going out the historical window, forever, in the next decade.” – R Buckminster Fuller – 1962 – on the 2-way TV
 - Carnegie Commission 1967: "With minor exceptions, the total disappearance of instructional television would leave the educational system fundamentally unchanged."
- We now here similar statements about the revolution of the internet. Yet, for the most part ...
- **Teaching has not changed.**
- **Learning has.**

THE REAR-VIEW MIRROR EFFECT

“We look at the present through a rear-view mirror. We march backwards into the future.” - Marshall McLuhan

All communication media or technologies have their own bias or tendencies. If we are aware of these tendencies, we can use the media to our advantage. If we are not aware of these tendencies, the media use us.

Chalkboard Video.

As a communication medium, the chalkboard has certain characteristics. First off, there are no videos, photos, or animations, and it cannot be hooked up to a network.

Using a chalkboard in the classroom has other effects as well.

Writing on a chalkboard ... (written on chalkboard in the video)

- * encourages the teacher to move
 - * to think on the move
 - * to slow down
 - * to improvise
 - * to interact
- and
- * it limits class sizes to those who can see the board

PowerPoint is Different

- * easy
- * mindless
- * fast
- * linear

PowerPoint

- *helps the presenter remember their notes
- * while often doing great harm to the presentation

PowerPoint encourages students

- * to memorize key points
- * to let the professor decide which points should be “key”

* to regurgitate these “key points” on exams

PowerPoint

* great for “teachers”

* bad for learners

“Power corrupts. PowerPoint corrupts absolutely.” – Edward Tufte

I then show my video: Web 2.0: The Machine is Us/ing Us

I then recount the journey of the video from my basement in St. George Kansas through the blogosphere, Digg, Del.icio.us and on to 2.5 million + views internationally – proving the point of the video.

Have we prepared our students for this world?

What is the future of education?

- **SOURCES**
 - Katz, Vice President of Educause [.edu@2020](#) (2006)
 - Karl Fisch – Director of Technology – Arapaho High
(Did you Know? Fame ...) (2006)
 - Fisch building from Ian Jukes, the educational evangelist (2006)
 - 2020 Visions – Technology Administration of the US Dept. of Commerce
 - Microsoft
 - HP
 - George Lucas Educational Foundation
 - Will Wright of the Sims & Spore
 - Scholars from Harvard, USC, Carnegie Mellon
 - and others
 - UNESCO Report on Emerging Technologies

Katz’s Histories of the Future

- Hekedemos
- Corporate Mergers
 - Google Phoenix
 - Microsoft Pearson & Blackboard
 - Disney & Sony
- Countered by Virtual Ivy and Other Learning Alliances
- FacultyOne
- Can’t compete with screen actors guild
- PS6 Edutainment
- Simulation – De-Peopled Learning Environment (a non-human future)
- OTHER SIMULATIONS
 - George Lucas

- Diana Walczak

But all that is literally Child's Play ...

They all agreed on one trend toward ...

- Ubiquitous Information Access
 - Ubiquitous networking
 - Ubiquitous computing
 - Ubiquitous information
 - at unlimited speed
 - about everything
 - everywhere
 - from anywhere
 - on all kinds of devices

about EVERYTHING

* RFID

* several hundred million already

* 1,000 Wal-Mart stores

* as many as 500 billion by 2010

* in humans too

* lots of info about humans – with automated data exchange

* everywhere from anywhere – the mobile web

* augmented reality

* simulated reality

* TOTAL INFORMATION

* **What role does education play in this world of TOTAL INFORMATION?**

* **Imagine what could be if anybody anywhere could upload information about anything at anytime to be viewed by everybody everywhere**

* **Are we preparing our students to participate in this kind of world?**

- **CONCLUSION – 2 SCENARIOS**

1. Schools are increasingly irrelevant. They teach a standard core curriculum that despite best efforts is always several years behind the curve. They still teach information – even as information has become ubiquitous. The most important skills, how to critique and create information are largely learned outside the classroom. Only the most elite have the means and creativity to control and produce content. They dazzle the masses with technology. Everybody is always entertained. You go shopping in a world of augmented reality. You check out a T-Shirt. As you approach your mobile device buzzes, indicating that it has more information for you. You pull it out and see a slick branded commercial about the product. You're hooked. Your mobile also notes that it's the best price in town. You buy it. You feel empowered by the remarkable amount of information. You go home and cruise through a dizzying array of entertainment options. Every program &

every advertisement is specifically tailored to you. This is the ultimate YouTube ... and that sounds pretty good, but you are blinded to the broader human community all around you that supports this life. ½ the world is still working for less than \$2/day, 800 million are undernourished or starving. You watch “reality TV” that shows none of that reality. You like it because it is the most real thing you have ever experienced – even if it is mediated by dancing light emissions on a 42” plasma screen. You have joined the vast majority of people who no longer vote because you don't think it is worth it. And who really understands the real issues of the day anyway? Digital rights management, digital privacy, digital security – let those who know deal with those things. You go back to watching your program. But you are not just watching a program, you are the program, and you unwittingly serve a very small minority of humanity.

2. Schools everywhere across the globe encourage kids to use media and technology and not let it use them. Most people in the world can and do write blogs, create videos, tag content, comment on content, and participate in wikis. Reading has become a social activity that students embrace like they do Facebook. Students make comments on digital texts their classmates, teacher, and/or the whole world can see. Conversations emerge right on the page. Mobile phones, \$100 laptops & mesh networks, have extended the number of participants to over 4 billion people – 4 billion people who are savvy in the critique and creation of information. You go shopping in a world of augmented reality, but this reality is augmented by the information of 4 billion people, not a few million elite with an advertising agenda. You check out a T-Shirt. As you approach your mobile device buzzes, indicating that it has more information for you. You pull it out and see a picture uploaded by a woman in Honduras holding up the T-Shirt. There’s another picture. It’s her paystub. \$6 for the week. Not enough. She looks young. Too young. The information has been verified by thousands of other users. You pass on the shirt, knowing that the company will have a hard time selling any shirts until they change their labor practices. You marvel that human values finally compete with economic values, and at how you have been empowered to make choices that help the world become more just and equal. You walk home through the park. You wonder what kind of tree you are approaching. A GPS-enabled community authored wiki quickly gives you the answer, including who planted it and when – a flurry of pictures that have been taken in that spot appear before your eyes – geotagged on Flickr and shared with the community. You think of your friends, check your friends list and see 2 of them are meeting at a coffee shop nearby. You decide to join them. You appreciate the conveniences & possibilities of ubiquitous information, but recognize that this means there is a great deal of information about yourself out on the web as well. Everybody is concerned. And so you, along with billions of others, are vigilant about abuses of digital privacy and digital security. Your vigilance has paid off and you share information about yourself on your own terms. You, like billions of others, are not a program. You, like billions of others, are the programmer.