Today I’m talking about DIGITAL TEXTBOOKS
and
PINK FLOYD
TODAY IN 2 PARTS

Education

Digital Textbooks

Today

Why aren’t we all using it yet?

So then what do we need?

Document Authoring and Document Layout
Something INCREDIBLE happened
an iPad App

WON AN OSCAR
BY THE WAY

my color scheme:
OLD SCHOOL
Education until the 1800s
INDUSTRIAL REVOLUTION
standardization!
Education since then: Factory Model
everyone gets to know the same material
multicast teaching
INTELLIGENCES

Linguistic
Logical-Mathematical
Spatial
Bodily-Kinesthetic
Musical
Interpersonal
Intrapersonal
ALL IN ALL YOU'RE JUST ANOTHER BRICK IN THE WALL

at least we get good music
not modular, interdependent

if it was modular, we could teach to
people’s learning strengths

   New insights into material from new viewpoints

Yes, this is VERY DIFFICULT!
what about students’ MOTIVATION?
I must study politics and war that my sons may have liberty to study mathematics and politics... in order to give their children the right to study painting, poetry, music, architecture...
“we work to better ourselves”
It’s about time we DISRUPT EDUCATION
we can do this with

COMPUTER
SCIENCE!
DIGITAL COGNITIVE AIDS

Students
  Individualized

Educators
  Centralize, Customize, Democratize

Publishers
  Adapt or Die
we could even realize

MASTERY LEARNING

enable a variable rate of learning
right around now I tell myself

ENOUGH

DREAMING!
DIGITAL BOOKS TODAY

Worse

PDF Readers

Amazon Kindle, ePub

Digital Textbooks: Inkling, iTunesU

Once-offs: “Our Choice”

Hmm...

Wolfram CDF
THE IMPOSITION AND SUPERIMPOSITION OF DIGITAL READING TECHNOLOGY

“How does digital readers support or break current reading techniques?”

Kindle DX
39 participants
1 year study
  Diary study, Interviews
PDF Papers, Kindle books

Thayer et al, CHI’11
THE IMPOSITION AND SUPERIMPOSITION OF DIGITAL READING TECHNOLOGY

Reading Tasks links Reading Techniques
- scanning, search, skim, receptive, responsive

eReader academic challenges
- creating markup
- nonsequential navigating, jumping to references
- locating illustrations, assessing content
- creating cognitive maps

Thayer et al, CHI’11
“in our study, all students who always markup text FAILED to integrate the eReader into their academic practices”
COGNITIVE MAPS

Unconsciously link ideas to locations gets broken. Why?

- Fragmentation of ideas
- Kills skimming with small sizes and scrolling
- No kinesthetic cues
- Loss of spatial knowledge

Thayer et al, CHI’11
the literature agrees, digital books and interactions are considered harmful
is there anybody out there?
Proposition 21: Vehicle License Fee for State Parks

The way it is now:
California has 278 state parks, including state beaches and historic parks. The current $400 million budget is insufficient to maintain these parks, and 150 parks will be shut down at least part-time. Most parks charge $12 per vehicle for admission.

What Prop 21 would do:
Proposes to charge car owners an extra $18 on their annual registration bill, to go into the state park fund. Cars that pay the charge would have free park admission.

Analysis:
Suppose that an extra $18 was charged to 100% of California taxpayers. Park admission would be free for those who paid the charge.

This would collect an extra $174 million ($246 million from the tax, minus $72 million lost revenue from admission) for a total state park budget of $574 million. This is not sufficient to maintain the parks, and 19 parks would be shut down at least part-time.

Park attendance would rise by 35%, to 101 million visits each year.
Push Pop Press’
OUR CHOICE
Apple’s ITUNES U

APPLE’S NEW TEXTBOOKS 101
INKLING

✓ Video clips
✓ Animations
✓ Test-yourself
✗ Navigation
✗ Layout
✗ Annotation
?q Cognitive Maps
?q Authoring
Reactive documents with CDF
REQUIREMENTS

(Non)sequential Navigation

Great Layout
  support Cognitive Maps
  cohesive ideas

Annotation

Authoring
physical metaphors, such as PAGES
Measuring time-to-wall from each angle...

4.04 sec

tightly coupled

INTERACTIVE

text and figures
brand new INTERACTIONS
support
REMIXING
WHAT TO BUILD

Language to describe document
   Possibly just a DOM later on?

Automatic Layout engine

Rendering Environment
   must support “engines”, interactivity
   must support a variety of devices
   HTML/CSS/Javascript
AUTOMATED LAYOUT

TeX

VH-Box

Lay out a continuous flow

Knuth-Plass line-breaking algorithm

First-Fit figures after first reference
Adaptive Layout

Jacobs et al, SIGGRAPH 2003

Create template based on constraints
Have multiple templates grouped into style
Write content as separate streams
  Text, Figures
Lay out content streams into template boxes
  calculate "goodness" score
pick template with best score
Hand-tuned

http://stephencaver.com/
of course

THERE’S MORE

Hurst et al. “Review of Automatic Document Formatting”
OUR IDEA

Associations

We require closely linked figures and text
Author knows text-figure associations

Encode associations in language

Layout should optimize both
using FGSMRJMJCMC*?

*factor graphs, simulated annealing, reversible jump markov chain monte carlo
Just a small slice of the PIE
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  - New Student? Enroll today in our online class for free!

- **Login**
  - Already enrolled? Click here to login to access course materials and participate in discussion

- **Preview Videos**
  - Want a preview of what is coming up next? Watch the lecture videos here without creating an account.
Thank you!

COME AWAY FROM THE WINDOW! YOU DON'T WANT TO BE A CHILD LEFT BEHIND, DO YOU?

SOUNDS GOOD TO ME!