



Openness, Data, and the Future of Education

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Department of Instructional Psychology & Technology
Brigham Young University



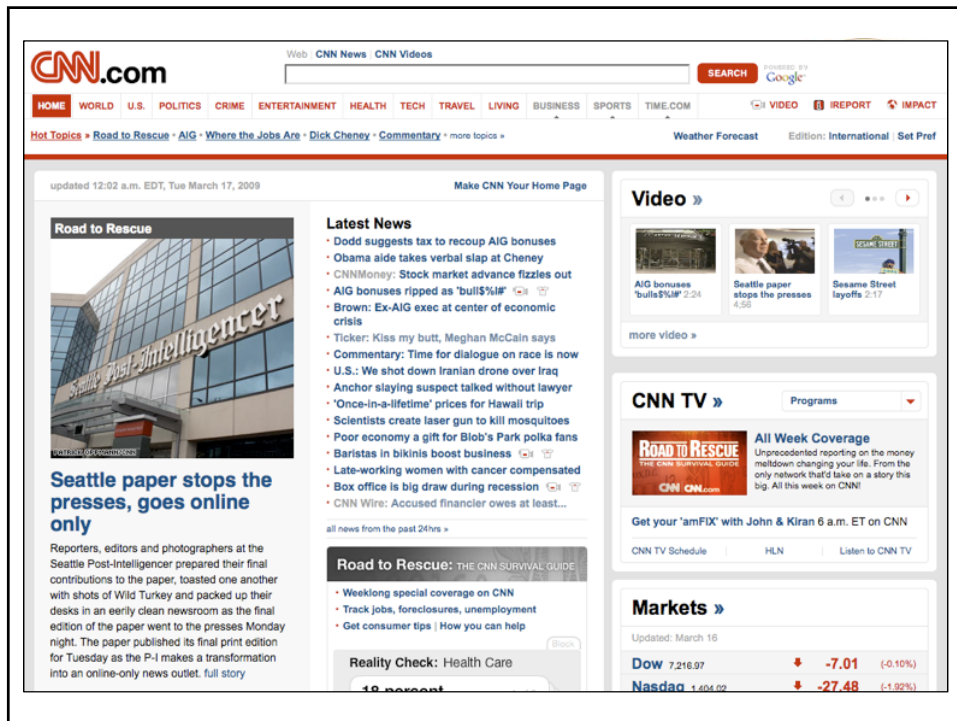
The Gutenberg Difference

From slow, expensive copies
to fast, inexpensive copies



The Internet Difference

From fast, inexpensive copies
to instantaneous, free copies



Small (c) Problems

Just because you can copy
doesn't mean you're allowed to



Open Educational Resources

Hacking (c) to leverage the nonrivalrous nature of digital educational materials



Open, adj.

Providing users a collection of rights called “the four R’s” - for free

The 4 Rs



Reuse - verbatim copies

Redistribute - share copies

Revise - make adaptations

Remix - combinations / mashups



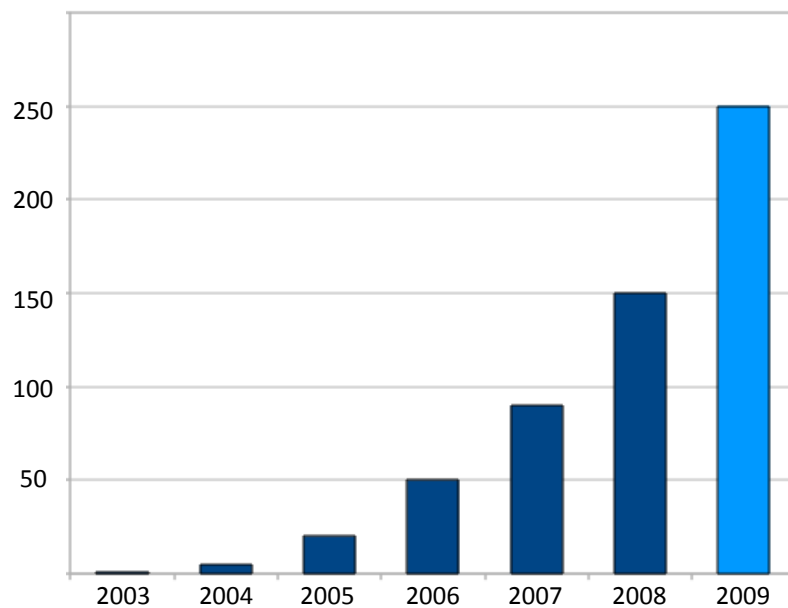
Communicate 4Rs Permissions

Since this overrides default copyright,
you must use a copyright license



Offers easy to use 4R's licenses

CC Licensed Items Online (Millions)



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this exact wording or phrase:

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Numeric range: **

(e.g. \$1500..\$3000)

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Quiz 2 (PDF)	(PDF)
Quiz 3 (PDF)	(PDF)
Final Exam (PDF)	(PDF)

Quizzes from previous years can be found [here](#).

strang-1806-lec0... **RealPlayer**
Paused 197Kbps 14:04/49:48

openlearninginitiative Carnegie Mellon

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Open & Free courses are freely available online courses and course materials that enact instruction for an entire course in an online format.

Engineering Statics

Statics is a sophomore level engineering course, offered in all mechanical and civil engineering programs. We study methods of quantifying the forces between bodies, for example parts of mechanical, structural, and biological systems.

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Statistics

Introduces the basic concepts, logic, and issues involved in statistical reasoning. Topics include exploratory data analysis, research methods, probability, and statistical inference. Two versions of the course; eight StatTutor (cognitive tutor) labs.

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Causal claims permeate everyday life and are constantly the subject of studies reported in the newspaper. This course examines the nature of causal claims and the statistical sorts of evidence used to support them.

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The Introductory Economics course is a collection of online experiments and related on-line workbooks which can be used by individual learners or to supplement an instructor lead course.

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Open Learning at BYU

Free public access to select courses and exemplary student work

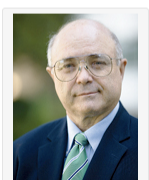
[Welcome!](#) | [Participating Departments](#)

Welcome!

Welcome to the pilot **Open Learning** project at the [David O. McKay School of Education](#) at [Brigham Young University](#). The pilot includes free and open access to the materials used by participating MSE faculty to teach their courses. Samples of exemplary student work are also provided.

Message from Dean Young

"While none of us know exactly how learning will be facilitated in the future, we do know that BYU can bless the lives of millions of our brothers and sisters. As an educator, I can think of nothing more rewarding or humbling than to be blessed to live in an age when our Heavenly Father has given us the tools to bring the uplifting and edifying BYU experience to all of our Father in Heaven's children. The David O. McKay School of Education is committed to taking the principles of Open Learning forward." – David O. McKay School of Education Dean Richard Young



David O. McKay
School of Education
Dean Richard Young

What is the pilot Open Learning project?

The pilot Open Learning project does not award university credit and does not provide you with access to MSE faculty. The pilot Open Learning project provides you with free and open access to materials like lecture notes, syllabi, and assignments. Your use of these

Type and Wait to Search

Participating Departments

[Instructional Psychology & Technology](#)

The McKay School of Education

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CONSORTIUM

Institutions working together to advance education and empower people worldwide through opencourseware. [Learn more...](#)

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USE
Find Course Materials

SHARE
Share Your University's Courses

SUPPORT
Support the OCW Movement

[Home](#) > Consortium Members

CONSORTIUM MEMBERS

Institutions and organizations currently participating in OpenCourseWare Consortium activities are listed below:

Afghanistan ([member profiles](#))

- [Kabul Polytechnic University](#)

Australia ([member profiles](#))

- [University of Southern Queensland](#)

Austria ([member profiles](#))

- [Klagenfurt University](#)

Brazil ([member profiles](#))

- [ESAGS - Escola Superior de Administração e Gestão](#)
- [Fundação Getúlio Vargas - FGV Online](#)
- [Unioo- Universidade de Sorocaba](#)
- [Universidade Federal de Juiz de Fora](#)
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Canada ([member profiles](#))

- [Athabasca University](#)
- [Capilano University](#)

Chile ([member profiles](#))

- [Pontificia Universidad Católica de Chile](#)
- [Universidad de Chile](#)

Consortium Membership

Institutions participating in the Consortium...

- commit to publish at least 10 courses under the institution's name in an opencourseware format.
- commit resources as available in support of Consortium goals.

Organizations that do not publish their own materials, but whose activities further Consortium goals, also participate in Consortium activities.

Consortium members feature the following button on their web sites.

An OpenCourseWare site...

- is a free and open digital publication of high quality educational materials, organized as courses.
- is available for use and adaptation under an open license.
- does not typically provide certification or access to instructors.

[Click here](#) to learn more about becoming a member institution.

Consortium Members

- Afghanistan
- Australia
- Austria
- Brazil
- Canada
- Chile
- Colombia
- Costa Rica
- Dominican Republic
- France
- Iran, Islamic Republic Of
- Israel
- Japan
- Korea, Republic Of
- Lebanon
- Mexico
- Netherlands
- Palestinian Territory, Occupied
- Peru
- Puerto Rico
- Russian Federation
- Saudi Arabia

Community College Consortium for Open Educational Resources

Shared Knowledge

When educators pool their expertise to create a culture of shared knowledge, everyone benefits. Use of open textbooks can lower educational costs for students. Become involved with the open educational resources (OER) movement so that doors to higher education stay open to all.

Adopt Open Textbooks

The **Community College Consortium for Open Educational Resources (CCCOER)** is a joint effort by the OER Center for California, Foothill-De Anza Community College District, the League for Innovation in the Community College and many other community colleges and university partners to develop and use open educational resources (OER) and especially open textbooks in community college courses. We now have over **150 CCCOER members**. For more details, see the *It Takes a Consortium to Support Open Textbooks* article in the January/February 2009 issue of *Educause Review* magazine.

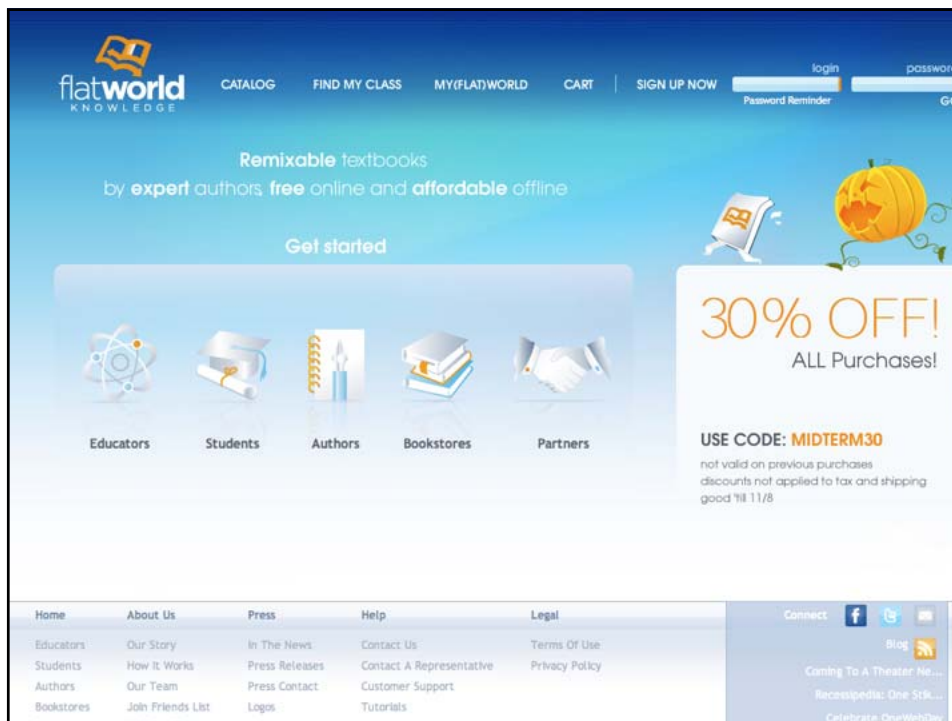
Hewlett Awards Open Textbook Grant

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- Resources
- Shared Knowledge
- Training

Featured Sites


- Academic Earth



The FlatWorld Knowledge homepage features a blue header with the logo and navigation links: CATALOG, FIND MY CLASS, MY(FLAT)WORLD, CART, SIGN UP NOW, login, password, Password Reminder, and GO. The main banner promotes "Remixable textbooks by expert authors, free online and affordable offline" with a "Get started" section for Educators, Students, Authors, Bookstores, and Partners. A large orange banner on the right offers "30% OFF! ALL Purchases!" with the code "MIDTERM30", valid until 11/8. The footer includes a grid of links for Home, About Us, Press, Help, and Legal, along with social media icons and a "Connect" section.



The CK-12 flexbook website has a white background with a green and orange header. The "flexbook" logo is prominent, with a "create your own" button. A sidebar on the left includes a "Demo" video player, "Our Tool", "News & Presentations", and a "Survey" about Governor Schwarzenegger's initiative. The main content area describes the CK-12 Foundation's mission and includes a "Search Or Browse Our FlexBooks" section with a search bar and a list of subjects: Physics, Mathematics, and Biology. The right sidebar features a "Join the Discussion!" link, a "Featured Chapter" on Biophysics by David Slykhuis, and a "Featured Author" profile for Bruce Davidson.




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The Star Teacher Program offers a wide range of services, discounts and rewards to help you get your job done – the smart way.

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Resources: 26222
Members: 73163
Groups: 369

cur-ric-u-la

Courses of study

1

2

3

4

5

Find

Collect lesson plans, teaching activities, student worksheets and more.

Featured Resource:

Magic or Science?

Contribute

Share your favorite curriculum resources to improve education globally.

Recently Reviewed:

Speech as Literature


Connect

Collaborate with teachers in your school, or educators around the world.

Featured Group:


The Parlin School

HIGHLIGHTS



Curriki's Blog

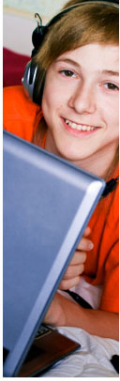
Curriki's blog is now available. We'll feature posts about open-source education trends, tips for conquering the digital divide, and, of course, share content and the latest news about Curriki. Check it out and leave us a comment! [Learn More](#)



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WHY CHOOSE THE OPEN HIGH SCHOOL OF UTAH?

Find Out Here.



IT'S ABOUT LEARNING

The Open High School of Utah is an online charter high school that leverages next-generation learning technology and strategic one-on-one tutoring to provide students with significantly better learning experiences.

LEARN MORE



Learn more about our innovative [teaching model](#), our world-class [open curriculum](#), and find answers to [frequently asked questions](#), or attend an [Openhouse](#).

APPLY TO ENROLL

Once you decide the Open High School of Utah is right for you, applying to enroll for the school year is easy with our [online enrollment system](#).

MEET OUR TEAM

Meet the incredible people involved with the Open High School of Utah, including our [board members](#), director, [teachers](#), [staff](#), [parents](#) and [students](#), and don't miss the [OHSU Blog](#).

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[Start Class](#) | [Tech Ticket](#)

ENROLL TODAY!

[Registration](#) | [Revise Application](#)

14



Bloom's 2 Sigma Challenge

Bloom, 1984



One-to-One Tutoring

And other methods compared to
30 students in the classroom



Average Tutored Student by 2 SD

In other words, the average student
is capable of much more



Tutoring is Expensive

So we teach class instead!

If the research on the 2 sigma problem yields practiced methods (methods that the *average teacher* or school faculty can *learn in a brief period* of time and use with *little more cost or time* than conventional instruction), it would be an educational *contribution of the greatest magnitude*. (p. 5)

Bloom, 1984



To Tutor Or Not to Tutor?

That is the (false) question



“Strategic Tutoring”

What if we could do one-on-one tutoring
just-in-time and just-on-topic?



Obs. 1 - Requires Great Insight

We’d have to know who needs help, when,
and what they need help with



Obs. 2 - Data Are the Key

You'd need live, fine-grained data about students, assessment, and curriculum



Obs. 3 – Good Data Are Expensive!

Who gathers and analyzes data like this?

Google [Advanced Search](#)

[View customizations](#)

Web [Show options...](#) Results 1 - 10 of about 2,450,000 for **football**. (0.66 seconds)

Did you mean: [football](#)

NFL.com - Official Site of the National Football League ☆
Official site of the National Football League. It delivers in-depth team pages for all clubs, game-day coverage with real time statistics and play-by-play ...
[www.nfl.com/](#) - [Cached](#) - [Similar](#)

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American football - Wikipedia, the free encyclopedia ☆
American **football**, known in the United States simply as **football** and often as gridiron or tackle **football** outside the United States, is a competitive team ...
[History](#) - [Rules](#) - [Players](#) - [Basic strategy](#)
[en.wikipedia.org/wiki/American_football](#) - [Cached](#) - [Similar](#)

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college **football**, **noaa football**, **football**, college, top25, BCS, NCAA, Division I, Division I-AA, Division I Bowl Subdivision, Division I Championship ...
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Video results for football

[Comedy Football](#)
3 min 27 sec - Mar 5, 2007
[www.youtube.com](#)

[NFL Fantasy Files: The Best Players](#)
2 min 36 sec - Sep 18, 2008
[www.youtube.com](#)

Mack Brown Texas Football ☆
MackBrown-TexasFootball.com Official Athletic Site, partner of CSTV Networks, Inc. The most comprehensive coverage of MackBrown-TexasFootball on the web.
[www.mackbrown-texasfootball.com/](#) - [Cached](#) - [Similar](#)

The Football Tragic ☆
They have truly been the outstanding success story of the fifth A-League season, their crowd numbers and **football** likewise impressive. ...
[thefootballtragic.blogspot.com/](#) - [Cached](#) - [Similar](#)

Football365 - Football News, Views, Gossip and much more... ☆

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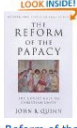

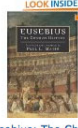

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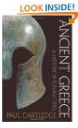

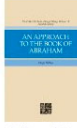
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Today's Recommendations For You

Here's a daily sample of items recommended for you. Click here to [see all recommendations](#). Page 26 of 30 (Start over)

 The Reform of the Papacy (Ut Unus...) (Hardcover) by John R. Quinn ★★★★★ (10) Fix this recommendation	 The Gnostic Paul (Paperback) by Elaine Pagels ★★★★★ (18) \$21.33 Fix this recommendation	 Eusebius: The Church History (Paperback) by Paul L. Maier ★★★★★ (33) \$10.87 Fix this recommendation	 On Earth as it is in Heaven... (Paperback) by Margaret Barker \$18.50 Fix this recommendation
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New For You Page 8 of 9 (start over)

 Ancient Greece: A History in Eight Volumes (Hardcover) by Paul Cartledge ★★★★★ (3) \$13.57 Fix this recommendation	 Metaprogramming Ruby / Facets (Paperback) by Paolo Perrotta ★★★★★ (2) \$21.75 Fix this recommendation	 The Collected Works of Hugh Nibley (Hardcover) by Hugh Nibley \$35.84 Fix this recommendation
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Amazon Kindle Leather Cover (Fits 6" Display, Latest Generation Kindle)

Rate this item
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☐ This was a gift
☐ Don't use for recommendations

Items you own (165)
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Because you enjoyed:
X-Men
Pirates of the Caribbean: Black Pearl
Spider-Man

Add

★★★★★



Each and Every Interaction

Recorded and stored for analysis
to improve quality of service / experience

Smith's
market fresh. money smart.

Weekly Ad Store Finder Rx Refills rewards Smith's rewards

Home Great Meals Healthy Living Fresh Foods Gift Center Services Pharmacy In Store See All

Search For In All Sites Welcome! Sign In/Register

Buy 8, Get \$4.00 Off
Instantly at checkout when using your Shopper's Card.
MARCH TO SAVINGS
Robert, Palos Verdes, CA
Look for the special tags on participating products.
Buy 8 Save \$4 Fuel March to Savings

Design a Reusable Bag
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digital coupons
click. load. save.
Load more than **\$35** in savings directly to your Shopper's Card.
Get started. >

ADVERTISED SPECIALS
4 for \$5
Dozen Large Eggs
Smith's, Grade AA
Save With Card
1.99 lb.
Fresh Boneless, Skinless Chicken Breasts
Smith's, Super Value Pack
Everyday Low Price!
*1.99



Even the Grocer!

Almost every industry uses data more effectively than education



How Can We Get the Data?

One option is to follow Google, Amazon, Netflix, WoW, etc.



Do School *Online*

Where each and every interaction can be
captured and stored for analysis



What Kind of Data?

When they logged in, read, and worked
How long they logged in, read, and worked
Pathway information
Item-by-item analytics
&c.



OHSU Teaching Model

Online curriculum teaches as much as possible,
teachers do proactive “strategic tutoring”



Another Benefit of Data

Engage in continuous improvement of
curriculum materials



Can You Improve Curriculum?

Data aren't sufficient – you need permission



OHSU Charter Requires OER

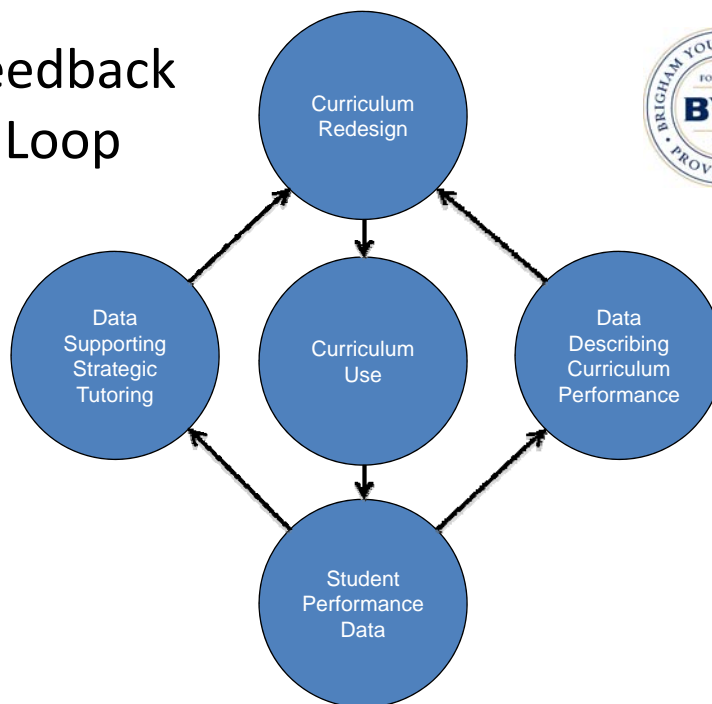
Founders' way of "burning the ships"



Conjoint Continuous Improvement

Student learning and curriculum effectiveness
grow simultaneously

Feedback Loop





Capturing Out-of-Band Tutoring

Using customer relationship management (CRM) tools

Each person has a page. Photo, title, company, tags, and more.

Add notes about calls, meetings, history, etc. Attach files too.

This note has a lock to let you know only you can see it. Notes can also have files attached just like an email can.

You can even include images or links to movies or audio in your notes.

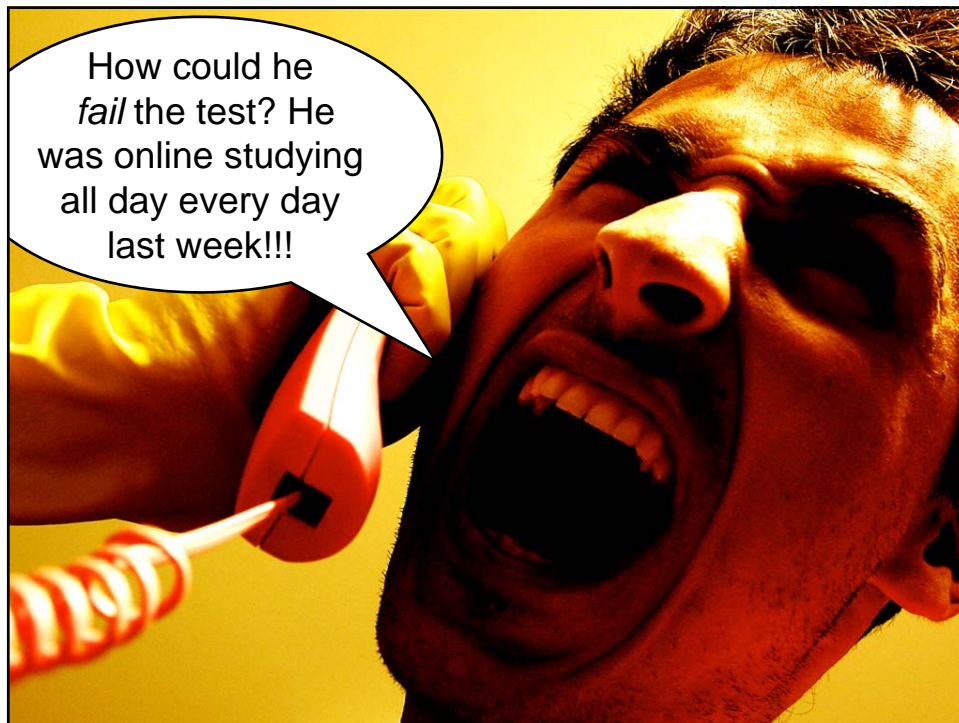
Attach emails too!

Got something to do for this person? Just add a task and get it done.

All the tasks you need to get done regarding this person are shown in the sidebar. Check 'em off as you finish them.

Contact information and vCard export is always near by. A map too!

Store bio/background information for historical research or posterity. Also useful to get up to speed on people you don't know.



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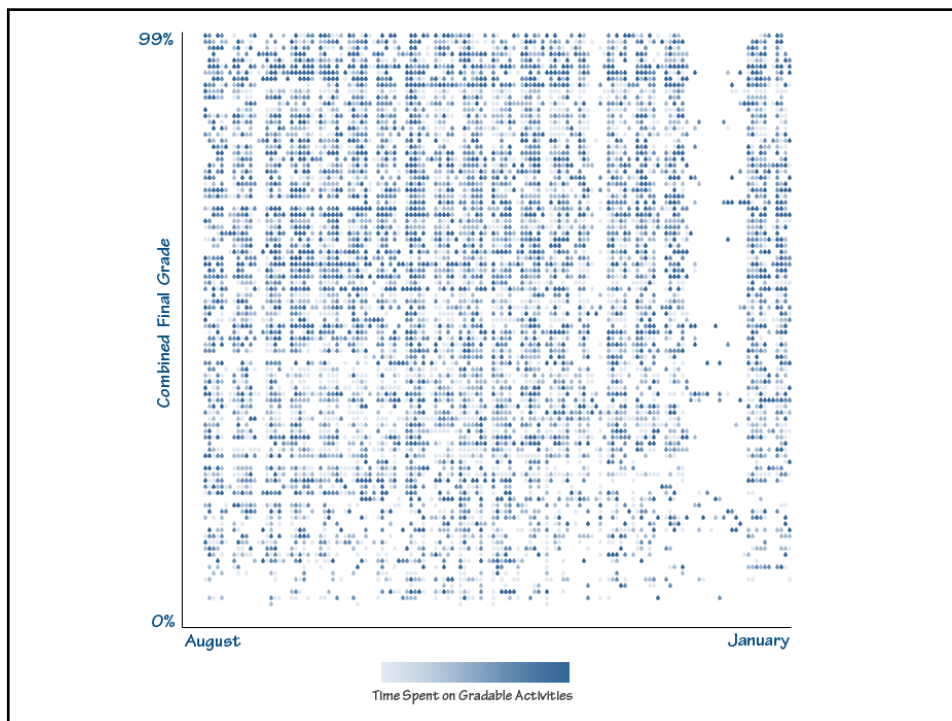
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Visualizing Educational Data

Creating new visualization techniques to support teaching and learning





Open Textbook Pilot

Replacing expensive textbooks with
OER textbooks from CK12.org



2010-2011

2100 students in Earth Systems,
Biology, and Chemistry



\$10 per book

As opposed to \$80+ per book



Textbook as Consumable

Students can highlight, annotate,
and keep their textbooks



At Least 50% Cost Savings

We believe levels of learning
will be constant or improve slightly



Thank You

david.wiley@byu.edu
<http://davidwiley.org/>