iLab Workshop Museum Group

Tuesday morn

tinkering...

evolving new ways of thinking and knowing

range of levels
    intergenerational

enjoyment

different kind of learning institution, and each is unique, but networked to some extent

teacher professional development

collaborative space for scientists/public

R & D in informal science education

Tues aft

NC Science and Math Academy and Illinois Math and Science Academy – iLabs would work very well with R req't for students

ISE not just museums, but science centers, science writing, media, etc. – 360 in our lives

NM has statewide Learning Management System, part of Cyber Learning System – training not just for Ts but for admins as well

iLab as iLab
    Q: Given that it exists, why is it not spreading? (Phil's Q)
        and connect that to your env't – why or why wouldn't you use it

        K-12: First, making Ts aware that it exists; then, once available and w/ a marketing campaign, other issues come in – interface has to be diff., prep for Ts to use, whether in or out of class
        It can be a great way to get kids int'd in Sci – doing science, not just reading about it

        Better case has to be made for what need iLabs fulfill
        Chip Bruce's paper – technology and communication
            needs video, blog, things that will make more approachable for Ts

How are labs chosen?
- is it haphazard or based on need?

Other audiences beyond public schools? Do we need broker/mediator to make that connection? If people aren't already engaged, what are the structures (e.g. after-school program, clubs) that we need to make that happen

For classroom – need to demo. that it can work in the classroom, so T trying to use it would have to put in a lot of time even for just a single lab; need a pilot demo of how it would work, elaborated
- need a Edutopia video!

Paying att'n to how this would change scheduling of class period in school

In virtual school – assignment driven, and much more flexibility with time
- more opp to delve more deeply into an exp't - -should work well with online courses
  - a good place to start w/ creating awareness -- better than trad. schools b/c of chance of success

Segmenting project for diff groups

How do we assess?

lack of goals for lab programs – what are we expecting Ss to get out of this?

How do iLabs fit into a broader curric?
- need explanation of the fit
- Kirky and Phil get it, they've already drunk the kool-aid
  - but two diff audiences – Uni level people who get the power and beauty of being able to access these labs, but HS level – have to show true relevancy – trying to inspire Ss who don't already get it; what makes an iLab relevant and exciting?

iLabs is a new way of doing science

What is ilabs about?
- not just UGs, HS juniors and seniors, but way to address more fund. issues of sci literacy with much broader audience

- We go to museums to *see* phenomena (viz, data), not just write about it

also, gives chance to experience messiness, multiple trials, etc. aspects of ral science

does it have to be connected to curriculum, or is it inquiry for inquiry's sake?

Changes needed for integrating in formal classrooms, but what about museums?

Given 1 minute or so window of time, might not be great fit – but from programmatic standpoint – intro a helper into the mix – an example of changing the idea of what a museum can be

so classrooms, museums – iLabs has the potential to cange whatever env't it is in

For exhibits – buys authenticity, e.g. dark matter detector in Chicago tunnels – even though not doing it in 30s, still valuable

Need to have something beyond physics

Ts who aren't physics Ts won't use

Is iLab an exercise or an exp't?

do we already know the answer? jumping through hoops

Authenticity: could tell Ss not real and they'd buy it maybe

MSi coal mine – sometimes faking it for greater good, sometimes to make it easier

if we want to emphasize the real factor, then we have to be very clear

cycle of real exp't, real data, then collaboratively manage, then feed in those results back into cycle

e.g. Cosmic Ray

xfer not only of scaffolding but authenticity – direct experience

e.g. not ilabs, but citizen science – e.g. galaxy classification – what took decades before, done quickly; online bird counts – huge amounts of data

but brings up question of quality of R

get enough data and whether expert or not is imaterial

public participation in science

range of partic – from data coll to defining the project

Galaxy Zoo forums – particps started talking with each other, and it turned out that new objects have been discovered

env sci lends itself to this, too

set of Qs that people work on – provides needed structure
e.g. KidsNet

from design point of view – there are changes in space and changes in time
Ts and time change – not likely
But changes in S involvement – holidays, days off, they're participating – exchanging data w/out restructuring the school day, not changing tech piece but changing way ~interstitial time was used

Q of interest to particps – if only physics, won't nec work, but other data collection/exp't have links, e.g. radon scoring

What about Ss sending in samples and getting them analyzed
prior examples – Bugscope

Dependability of iLab/instrument being there if you've spent time and energy crafting a curric?
Modular contributions to curric
e.g. Al Byer's work

How do we afford/train mediators?

How can remote labs be used in our diff settings? What do we need to make it work that's particular to our env'ts?

iLabs can help encourage/set up thinking before visit
Durham NC Life and Sci Mus – Field experience – class of Ss come to museum after having prepped, spend 5 hours and do actual DNA seq'g with scientist supervising

School setting: not nec in general physics class, but in rural setting for high-level Ss who can't make it to museum, can use iLab
would need mentor in the subject area, eqp't that's relevant to S's interest

At state math and science academy – for R project, could have menu of 10 R instruments that forms core of R project
if S was in structured R class, shouldn't take much more
but do need front-end material before S poses R Q

to make this work outside of these types of schools, Ts will need help with this

this is where museums (IFI) come in; NASA does this, too

online workshops

lead Ts prepare materials, refine, share

and if exp't is of interest, then data set grows and feeds back, strengthening project

env'tl sci is great example of this

NASA R projects – provided opp for Ss to put exp'ts on Low Gravity Platform

Ss really need to understand the actuality of these opps (cf. student who said, "Well, this would work if this were Second Life"!)

Danger of Ss feeling, having engaged in the real stuff, that science is boring

Can be a good thing – some Ss need to learn that R is not for them

Tension that Jeff was talking about – are we going for inspiration, sci literacy or for pipeline building?

We don't want false inspiration

But we do need sci Ts who understand the process of doing science

Even if R doesn't lead to being scientist, there are transferable skills

iLab not just for doing exp't or running a lab, but helping Ss think about how instrumentation works – e.g. satellite (Duke Forest exp't with Ss holding up mirrored boards; people submitting panoramic photos and correlating with vegetation imagery; NASA Kid's Cam – can submit for your area to be imaged – have to pose a Q)

Given all these similar programs, what is diff about iLabs – what does it bring?

Partnership models – Adler: Nat'l Lab leads project with core Ts and curric, semester-long at least; Ts and Ss can follow-up, summer camps, other ways

e.g. Inquiry Page

Needs – what about Rs who need connections to do meaningful outreach – this could be opp for Rs who have cool stuff to make connections

not just Uni Rs, but industry – e.g. "Can we do something with microbio?"

e.g. of NU Chem prof, NC State R, Science House, iLabs

Two cultures problem – trying to bridge Rs and educators and making it long-term.

What do we want in iLabs? What iLab do you want next?

Satellites
NMR
x-ray crystallography
imaging
surgery, bugs – high relevance

limited resources
we're running out of helium

diff b/w exercise and exp't
exp't is much more enticing and relevant
choose exp'ts with more than one variable
allows Ss to come up with their own Qs
creates opps for real stats (multi-variable stats)
Shodor Fdn for math
their tool – InterActivate

who is really the audience?
most Ss aren't able to do multivariable, stats – is this just the latest gizmo or
are we selling Ss short? Can't Ss handle if it's put in the right context and guided?
haven't even given new science a go in our schools (cf. 1916 book of same phys exp'ts we're doing today)

adv. of iLab model – can't afford eqp't to do new science

where do the labs fit in now?
need to restructure
but where does it fit now?
a-s programs, speciality classes
but can't do only these, b/c we'll miss vast pop. of underserved

example of mass dist. – Google Earth – could be dropped in
some topics have disappeared due to need for breadth, e.g. nuclear chemistry

what do non-science people think about this?
article: Ss think globally act locally

useful – Ss creating their own iLabs, blogs, motivation then reaches beyond the classroom

iLabs have ability to inspire Ss to pursue sci and math, learn sci process: analyze data, etc.

Need to be realistic with what's involved – packaging for diff audiences, need for mediators

it can be done – Bruce Friend tells of economics program where Ss interacted online with professionals otherwise totally inaccessible

setting it up won't be the biggest problem, but rather having mediators available

Can museums serve as lab providers, not just lab users? In other words, might a science museum host one or more lab devices for use by a broader community?

How do you envision iLab technology being integrated into museum exhibits, education programs, or special events? What might these applications of the technology look like?

What new strategies and practices would be enabled in informal science education by using iLab technology?

What kind of support would you need to implement these types of exhibits, programs, and events in museums?

What types of partnerships would be needed?

What are some major barriers in utilizing iLab technology in the museum setting?