Academy for Innovation in Medical Education:

“Why Now?”

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(Acknowledgements: Drs. Warren Wiechmann and Cameron Ricks)
DISRUPTIVE TECHNOLOGY

Today all of this fits into a digital tablet!
HOW WILL WE TEACH HENRY?

13 months old

(W. Wiechmann: 2012)
Digital Technology and Medical School Education

1. Why?

2. What?

3. How?

4. So what!

5. What’s next?
Education: Moving to a digital platform

UC Irvine – School of Medicine: The Way It Was: 2009

• One professor lecturing to a class of 104 students. Learning was mostly done in one’s room pouring over ponderous texts and paper hand outs.

• One size fits all model: Failure to minister to different styles of student learning

• Knowledge acquisition was haphazard.
Why Change?

“I know there is a lot of teaching going on...

I’m just not sure that there is a lot of learning!”

G. Andriole, M.D.
Chair of Urology
Washington University
iMedEd Initiative

internet
innovative
independent
interactive
individual
Tipping point:
April 3, 2010: iPad debut

So here is a radical idea for your consideration...we purchase an iPad for every student...and load the first years with all of the texts they would need...

Email to the Associate Deans, June 26, 2010

T-minus 6 weeks

Key recipient: Dr. Warren Wiechmann!
The iMedEd Initiative: What we did with the iPad

iMedEd Initiative
Years 1, 2, and 3

330 student iPads & cases
15 digital textbooks
40 Apps and Online subscriptions
75 Faculty & Staff iPads
Podcast Capture System (Mediasite)
Updated Content Management System
“Pre-loaded” Content

Digital Textbooks

Lippincott Biochemistry
Haines Neuroanatomy: An Atlas
Bates’ Guide to Physical Examination
BRS Cell Biology
Atlas of Human Anatomy by Gilroy
Thieme Dissector
Grant’s Dissector
Thompson & Thompson Genetics
Netter’s Histology Flash Cards
Gartner Histology
Medical Physiology by Michael
Neuroanatomy Through Clinical Cases
Leonard’s Human Gross Anatomy
“PORTABILITY AND ACCESS?”

33 pounds

6,000-48,000 pages

(W. Wiechmann: 2012)
“PORTABILITY AND ACCESS!”
Curriculum “Reboot”

Technology-enabled small group sessions

Novel Curriculum on Digital Literacy and Digital Professionalism

Simulated EMR in first clinical experiences

Audience Response Technology

Spaced learning – anytime - anywhere

Podcasts and Flipped Classroom

80% mandatory classroom attendance
Ingredients for Implementation

Vision, Leadership, Innovators, Infrastructure and Money

- **Vision**: Someone must paint the picture for change

- **Leadership**: You must win over students, administrators, and faculty

- **Innovators**: Find the core group that will work the details – you need a “true believer” who can be an accelerator

- **Infrastructure**: Hire additional staff to create learner groups for students and faculty

- **Money**: iPads are not enough...infrastructure, administration, faculty development, etc
So What!
I prefer to use my iPad in class (versus laptop or other traditional methods)

1st class
- Strongly Disagree: 24%
- Somewhat Disagree: 24%
- Somewhat Agree: 24%
- Strongly Agree: 28%

2nd class
- Strongly Disagree: 13%
- Somewhat Disagree: 4%
- Somewhat Agree: 4%
- Strongly Agree: 68%
The iPad allows me alternative study methods I had not previously used.
Using the iPad saves me time in my studies

1st class

- Strongly disagree: 12%
- Somewhat disagree: 14%
- Somewhat agree: 41%
- Strongly agree: 33%

74%

2nd class

- Strongly disagree: 1%
- Somewhat disagree: 11%
- Somewhat agree: 52%
- Strongly agree: 36%

88%

(W. Wiechmann: 2012)
So What Happened?

“A difference to be a difference must make a difference.” G. Stein

UCI’s 2nd iPad class jumped to the national standing from 62nd percentile to 62nd percentile; while the national percentile showed a slight gain.
85% I was aware of the iMedEd Initiative when applying to this medical school

59% I applied to UCI because I wanted to take advantage of the iMedEd Initiative

81% The iMedEd Initiative positively influenced my decision to attend UCI versus another program

2013: UC Irvine medical school applications have risen to 5,770 for 104 positions – selectivity ratio of 1.8%
Where Is This All Headed?

An Equivalency of Curricula:

We need to begin to develop a UC Irvine Medical School digital **text** with the entire first two years of medical school on line based on the iPAD iMedEd curriculum and easily **searchable**.
Simulation Center: UC Irvine Health
Why Simulation: Challenges of Teaching as it Exists TODAY...

Cognitive:
Emphasis on individual knowledge and skill rather than performance of clinical teams
Emphasis on test-taking, systematic basic science education

Manipulative skills:
“See one, do one, teach one” mentality
Clinical training is an unsystematic apprenticeship
Patients may not realize they are being treated by a trainee
Learning curve should not be on people!

Why Simulation: A Safe Interactive Learning Environment

Safe environment - Allows trainees to take risks, make mistakes without risk to patients

Practice clinical decision-making

Learner-centered educational experience (not patient-centered)

Ensure systematic exposure to scenarios

Team training

Time for reflection on actions, deliberate practice - provide high-level feedback

Assess competency

Performance improvement & culture change

Simulation Center
Full scale OR, ability to simulate ED trauma bay, OB OR, critical care unit, ward

Video recording & teleconferencing worldwide

- 4 high-fidelity adult mannikins (Laerdal + METI)
- 3 high-fidelity pediatric simulators
- 5 ACLS mannikins
Simulation in Pre-clinical Years

UCI has integrated simulation into all four years of medical school curriculum

<10% of medical schools use patient simulators for both pre-clinical and clinical years

Examples:

• Physiology: Demonstrate cardiovascular physiology, various stages of shock, PA catheter
• Pharmacology: Real-time demonstrations of blood pressure medications and side effects using patient simulator
Medical Student Simulation Courses

- **MS1 & MS2:**
  - Physiology simulation
  - Pharmacology simulation
  - Clinical Foundations, BLS

- **MS3:**
  - CF3 simulation, BLS
  - Clerkship simulation (surgery, ICU, anesthesiology, family medicine, emergency medicine)

- **MS4:**
  - CF4 simulation, ACLS
Simulation for UC Irvine Residents

New resident orientation “boot camp”

Residents from pediatrics, surgery, anesthesiology, emergency medicine

• Practice clinical decision-making & communication
Simulation Center Utilization per Year

- 4,612 participants / 2,924 hours

Legend:
- Red: 2010-2011
- Purple: 2011-2012
- Green: 2012-2013
2012-2013 Revenue / Expenses

**Revenue:**
- ACLS/BLS/PALS/ATLS $28,734
- CME $31,300
- Operational Courses $1500
- Outreach $9345
- TOTAL = $70,879

**Expenses:**
- Personnel (Director, assoc. director, supervisor, sim techs, admin.): $377,000
- Equipment/supplies (service contracts, software, etc.): $202,000
- TOTAL = $579,000!
CONCLUSIONS

1. Tablet based learning – early results are encouraging – provides better environment for increasing learning opportunities – and sets the future for flipped classrooms and spaced learning.

2. Simulation based learning – has the potential to enhance “team” medicine, eliminate the “patient” learning curve and provide objective data on student advancement in skills acquisition as well as judgment and cognitive knowledge.
“A single lamp can light hundreds more just as a man of knowledge can give it to many more. The brilliance of the light does not diminish despite its repeated use to light many more lamps. So too knowledge does not lessen when shared with or imparted to others. It benefits both the receiver and the giver.”

(Swamini Vimalananda and Radhika Krishnakumar)