“Mobile Innovations and Evolution in the Education Ecosystem”

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Mobile Innovations and Evolution in the Education Ecosystem

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Who gave Larry Page and Sergey Brin, two Stanford University students, $100,000 check to start Google company in 1998?
Andy Bechtolsheim, a former Stanford University student who co-founded **SUN Microsystems** with another Stanford student, Scott McNealy.
What does **SUN** stands for in the company name **SUN Microsystems**?
Stanford University Network
What is Yahoo’s original URL when Jerry Yang and David Filo were fiddling with their computers at Stanford University as students in 1994?
Akebono is the name of a famous Hawaiian sumo player

Yet Another Hierarchical Officous Oracle (Yahoo)
Bill Hewlett and Dave Packard graduated in electrical engineering from Stanford University. What company did they establish?
Mobile Innovations and Evolution in the Education Ecosystem
All living things evolve...

So do thoughts, values, practices, organizations, etc. Therefore, evolution is everywhere around us.

Let’s study some basic terms first.
A business or industry, as a living organism, often must evolve (i.e., to overcome or even leverage changes) in order to seek higher efficiencies and ensure its long-term sustainability (Kim, 2010).
Let’s look at some evolution examples from the industries.
Clock Speed & Value Priority

Boeing 747-100

1969
Take off…

Boeing 747-200

Land…

1976
The same way

Boeing 747-400

No faster

1989

Boeing 777-300

Value priority

1994

Ticket Price

Operation Cost

Profitable Routes
1981

Call
Text message
Take photo
Edit video
Browse
Mobinar
Do whatever

Value priority
Expansion and Quality
of User Experience

When ICT is the main driver of evolution = faster clock speed
Realities

• If the external evolution rate exceeds the internal evolution rate, extinction is eminent.
• Adapt to the changing rules of the game. Or die out.
• We know it, but the knowing and doing gap abounds.
• Many organizations are not good at evolving because they are busy putting out daily fires.
Education Ecosystem

New species
Founded in 1996
Completely online. Started as non-profit and received accreditation in 2003.
9000 students. 95% advanced degree seeking students. One 3-story building in the middle of desert in Arizona.
Going for organic growth.
Where are all the traditional university features?
Common Phenotypes (Characteristics)

✓ Convenient access (FlexNet, ALL-LINE)
✓ 21st Century ERP system
  (Tightly measure all performance indicators. CRM - every interaction matters.)
✓ Unbundled faculty roles
✓ Cloud services (Plug-n-Play) – buildings, online library DB, admission,
  writing support center, IT support, everything that are not core competencies /
  Faculty contract by course – highly disintegrated model
✓ Dynamically meeting the market needs
  (Movable or Cloud campus)
Student Generated Inquiries in MobiSocial Learning Environment
Synchronous to PCs & Asynchronous M2M
Tags are used to indicate subject, textbook, page, and problem number, problem title, etc.
“Stay Out of the Way! My Kid is Video Blogging Through a Phone!” A Lesson Learned from Math Tutoring Social Media for Children in Underserved Communities. International Journal of Online Pedagogy and Course Design, 1(1), 50-63
Mobile evolution continues...
Interact with people
Organize your e-portfolio
Research with NOKIA
Synchronous Mobinars
Design Based Learning

Integration of mobile technology and peripherals (e.g., sensors) into green science and engineering curriculum to promote youth innovation leadership.
Embedded mobile device to measure wind power and velocity from analyzing data captured with mobile devices.
Mobile Users > Desktop Internet Users Within 5 Years


Source: Morgan Stanley Research
StudentHome mobile device usage, by quarter

- Mobile version
- Full size version

Open University
Mobile Technology for Innovative, Inclusive, Integrative, & International Education Ecosystem.
Mobile Minutes

Water
Migrant indigenous children from Oaxaca mountain regions
PocketSchool for those who have no access to school
StoryReader coupled with paper stories!
Do you believe sesame street was helpful for children to learn? How about mobile sesame street? More important matter is that smartphones of today are going to be much better than just mobile sesame street.

Never owned a book in his life.

• An action research for the development of mobile learning system for the underserved. Educational Technology Research & Development. 57(3), pp. 415-435.
Global Partnership

Universidad Technologia, El Salvador

GAME CONTROLS

- Exit Key
- Select / Start Key
- Move Keys

Numbers:
- 0
- 4
- 1
- 5
- 7
- 6

Total:
- 10
Global Partnership

Universidad Tecnología, El Salvador

Mrs. Erlinda Hándal Vega
Vice Minister of Science & Technology
Global Partnership

Tumba College of Technology, Rwanda

Civic engagement, Genocide victims with HIV/AIDS/
Micro-business-based women empowerment /
Entrepreneurship & Mobile Storytelling

Dr. Gatare
Minister of ICT
Value-centered

Education Ecosystem

Service Learning Model

Relevant and Meaningful Experiences

Global Partnership for Global Causes
Do you remember why pocket-size mobile technology is different from desktop or even notebook computers?
• Mobile makes bottom up approach actually possible
• Easier to implement
• Leverage widely available cellular network
• Equalize access to educational development opportunities
• Strategic value alignment to cause evolution in the higher education ecosystem (University students + real world issues)
Alberto in a rural village school in Baja California, Mexico

“I want to study with the mobile computer, too!”

Mobile Exam and Audio Games for the blind. (Dominican Republic)

We always look for partners!
From device recognition to problem solving through collaborations.

Response tracking log
Optics Lab Control

Viewer

Live Video streaming by Ustream

LEDs

<table>
<thead>
<tr>
<th>Color</th>
<th>Status</th>
<th>Action</th>
</tr>
</thead>
<tbody>
<tr>
<td>Violet</td>
<td>LED is currently OFF:</td>
<td>Toggle LED</td>
</tr>
<tr>
<td>Infrared</td>
<td>LED is currently OFF:</td>
<td>Toggle LED</td>
</tr>
<tr>
<td>Purple</td>
<td>LED is currently OFF:</td>
<td>Toggle LED</td>
</tr>
<tr>
<td>Blue</td>
<td>LED is currently ON:</td>
<td>Toggle LED</td>
</tr>
<tr>
<td>Red</td>
<td>LED is currently ON:</td>
<td>Toggle LED</td>
</tr>
<tr>
<td>White</td>
<td>LED is currently OFF:</td>
<td>Toggle LED</td>
</tr>
<tr>
<td>Orange</td>
<td>LED is currently ON:</td>
<td>Toggle LED</td>
</tr>
</tbody>
</table>

Sensors

<table>
<thead>
<tr>
<th>Sensor</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Photo Resistor</td>
<td>9009.99 Ohm</td>
</tr>
<tr>
<td>Solar Cell</td>
<td>0.475 Volts</td>
</tr>
</tbody>
</table>
Last-mile education solution

Competition games
Mobile learning assessment
• Remotely Operated Science Experiment - A new approach to supplement real-time collaboration and online learning. (Forth coming).

Another region in Patna and Ranchi, and rural village in Gujrat, India.
Each child has a note pad.
Madaris Migrant Children (Never attended schools) playing Math games
2-hour drive from Rajkot, India
School on Wheels Children recording and listening their own stories
0:2.90 mins: Game Loaded
0:3.84 mins: Yellow
0:6.69 mins: Red
0:6.70 mins: Red Button Exit

0:2.91 mins: Game Loaded
0:6.16 mins: Red
0:6.17 mins: Red Button Exit

0:2.91 mins: Game Loaded
0:6.57 mins: Pressed playButton
0:50.77 mins: Threw Water
0:53.05 mins: Threw Water
0:54.43 mins: Red

As well as total time, scores, etc. were recorded.
Raising HIV Awareness

Counter the mis-conception
Competition game based
Learning HIV/AIDS & Track
Learning entrepreneurship
(1) UMUNYESHURI NA MUGANGA

Muganga: Uraho? Nakumarira iki?

Umunyeshuri: Muga, havugwa byinshi kuri virusi itera SIDA, ariko kugeza ubu sindumva SIDA icyo ari cyo. Ndagira ngo munsobanurire.

Muganga: Ndagusobanurira! Ni...
Content Management and Tracking System
(1) UMUNYUSHURI NA MUGANGA

Muganga: Uraho? Nokumana iko?
Umunyeshuri: Muga, hurugwa byinshi kuri virusi itero SIDA, anko kugata ukio sindamuru SIDA cyo ari cyo. Madagiza ego muhuriman'ire.
Muganga: Kuxwezerana nyabugamira, ni.
• Exploration of a Self-Directed Mobile Learning Model for the Extremely Underserved Communities. (International Journal of Educational Development. 10.1016/j.ijedudev.2011.05.008).

• PocketSchool Interactive Learning Ad-hoc Network and HIV/AIDS Education in the Developing Region. (Forth coming).
Portability
Less electricity consumption
Ease of implementation
Ease of maintenance
Performance tracking
Individualized intervention
Contextualized innovation vs. Reverse innovation - Much more energy efficient device. Alternative energy option for developing countries is green ideas for developed countries. Must be game-based/ activity-based in developing countries.
Individualize learning plan
Learning games & homework

Sync and generate reports on individual performance
(Pinpointing successful and struggling areas)
• Technology = Innovation/New possibilities/Enabling agent
• Content = Making technology meaningful/Efficient/Contextual
• Pedagogy = Make learning take place/Required competencies/skill/Nurture our children
• Value = Ethics/shared peace & prosperity, mental & physical wellbeing of our children

Technology < Content < Pedagogy < Value
21st Century Value-Centered Education Ecosystem

- Answers "Why?"
- Motivate Constituencies
- Ignite Passion
- Nurture
- Catalyze
- Enabling Agent
- New Possibilities
- Pedagogy
- Content
- Value
- Applicable
- Textualized

Shared peace & prosperity, mental & physical wellbeing, unity (Afghan refugee, Uganda refugee, Nomadic Indian tribes, HIV/AIDS victims of the genocide, children in Qalqilya, Palestine, students with disabilities, Ashram Ghandi, etc.

Must continue to evolve
Ways to get involved:

• Be a friend in Facebook
  • http://www.facebook.com/home.php#!/profile.php?id=1370630295

• Be a member of Seeds of Empowerment

• Sign up to be a volunteer for Seeds of Empowerment
  • http://seedsofempowerment.org/index.html

• Email Paul Kim at phkim@stanford.edu