One Device Will Rule Them All: Make Way for Mobile Technologies

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UNIVERSITY LIBRARIES

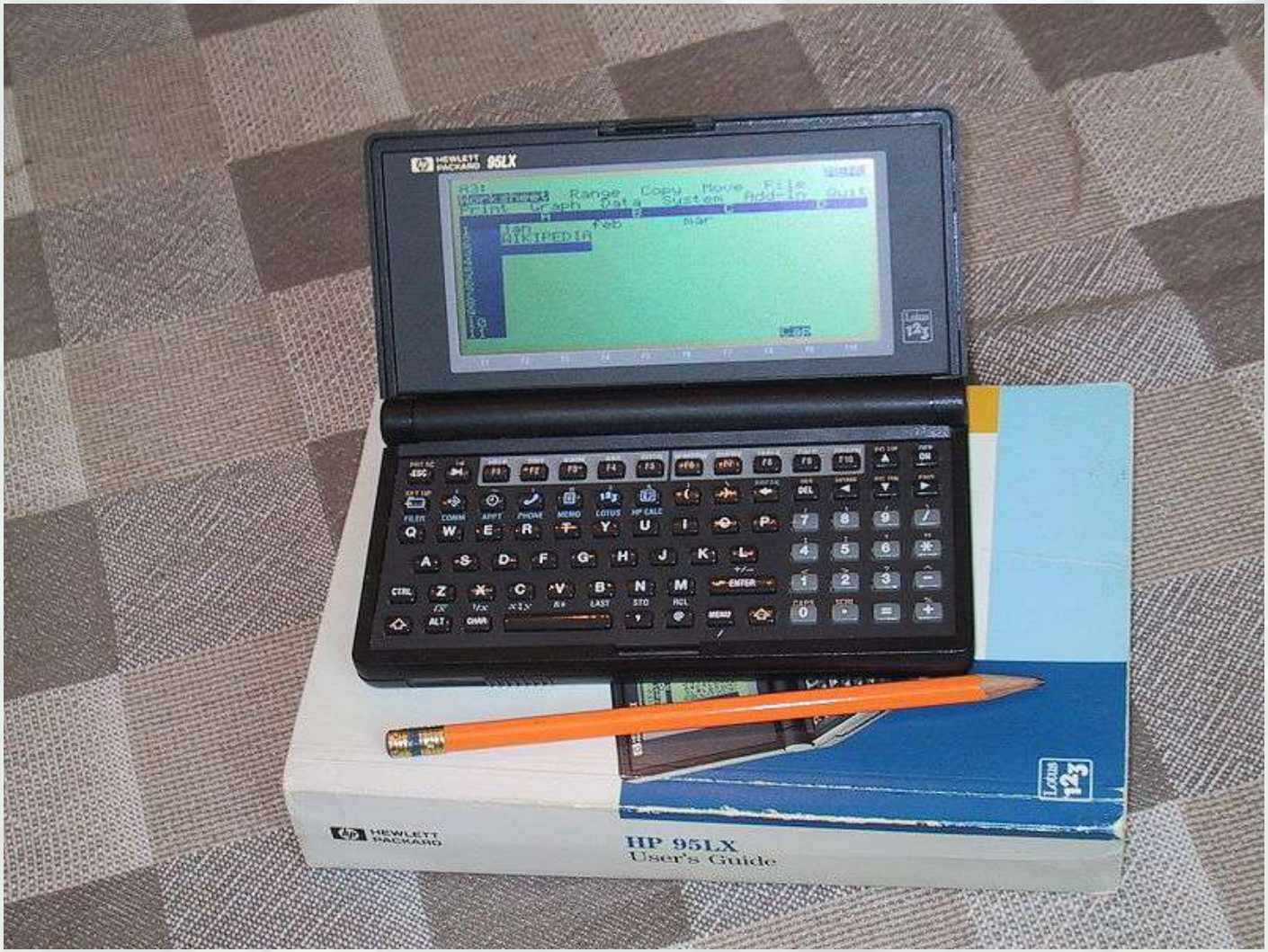
WHAT IS MOBILE COMPUTING?

Ubiquitous Computing

- Mark Weiser
- Computers of different sizes and shapes
- Serving many separate functions
- Focus on applications rather than devices
- Connecting electronic information to objects in the physical world.

Mark Weiser, "The Computer for the 21st Century," *Scientific American*, vol. 265, no. 3 (September 1991), pp. 94-105.

The road to ubiquitous computing

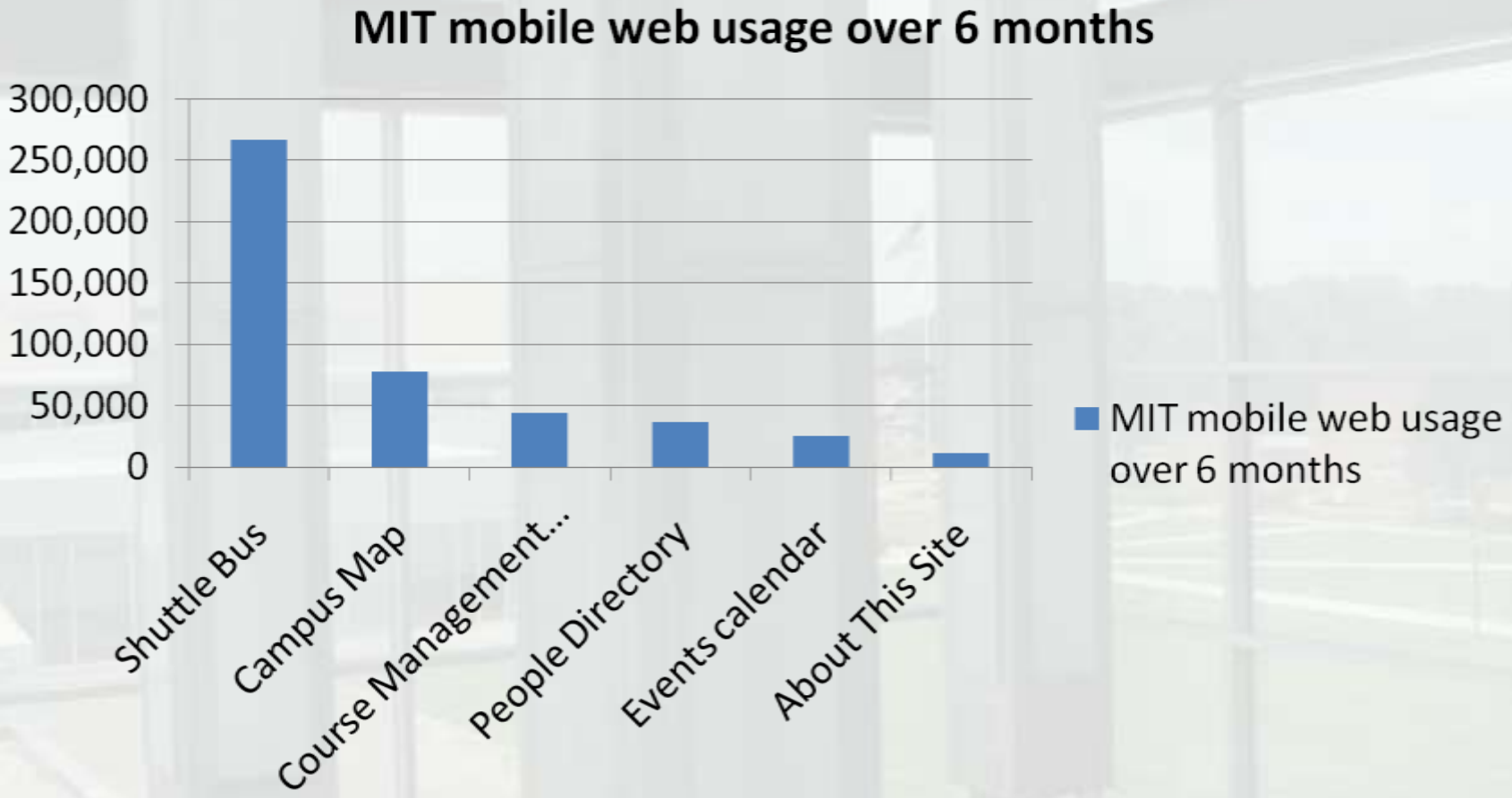


Ubiquitous computing-Redux

158,812 iPod apps (1 March 2010)

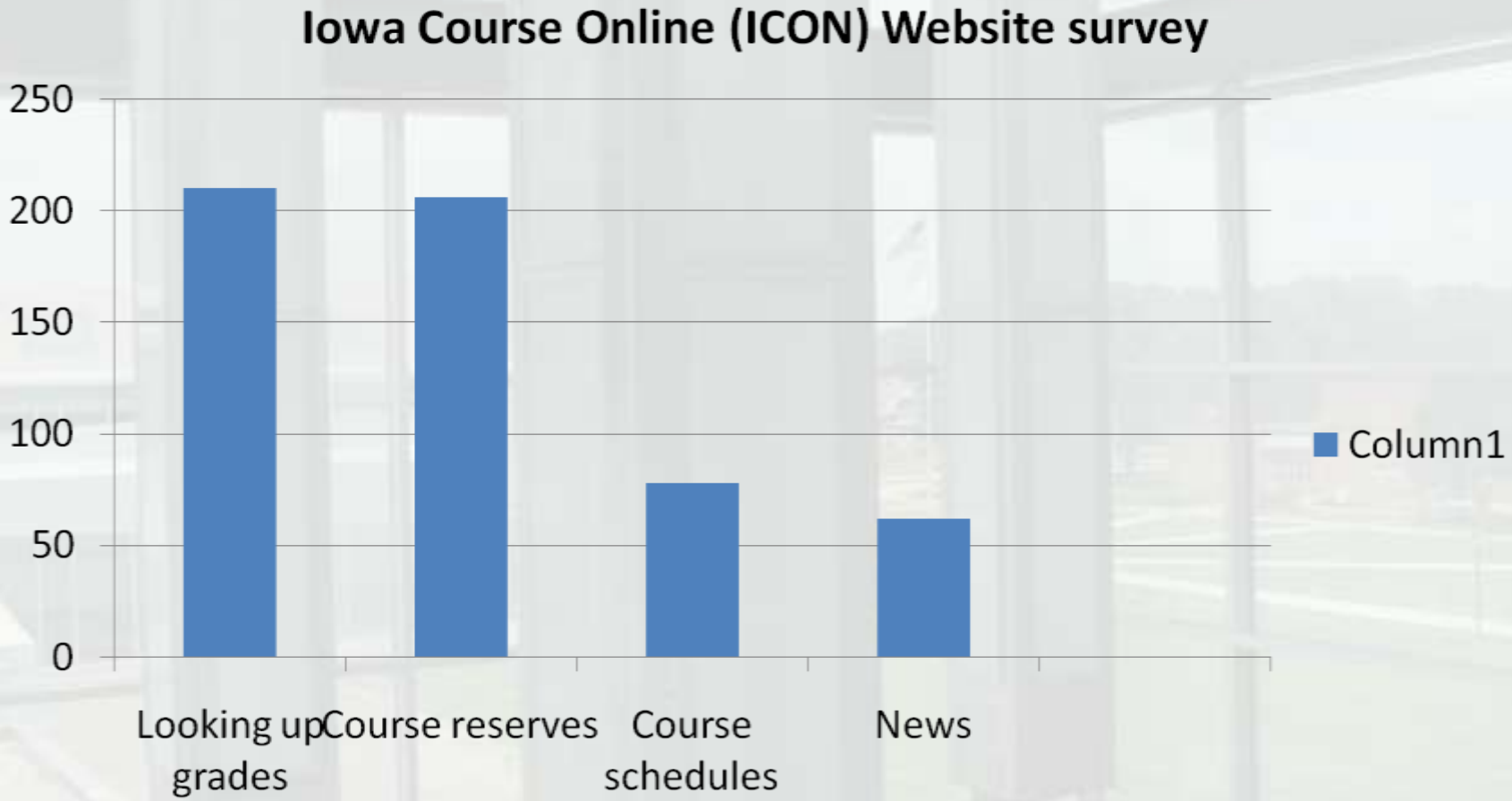
+ Apps =

How do people use the mobile web?



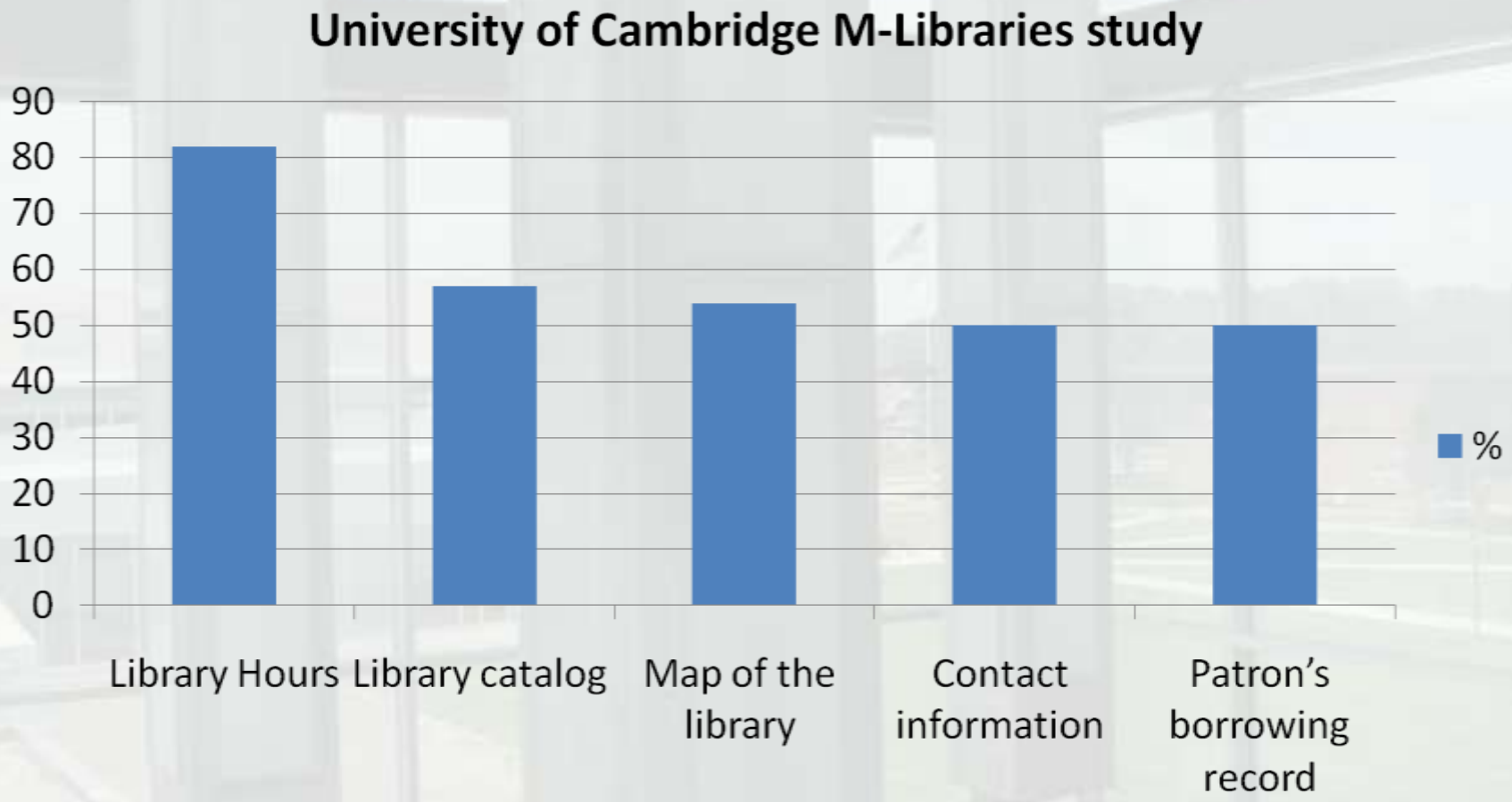
Andrew Yu, "Mobile Computing: Lessons learned," Panel discussion for "Reaching Consumers through Nontraditional Methods: What Can World Cat Do for You?" at the American Library Association Midwinter meeting in Boston, MA (January, 2010).

How do people use the mobile web?



University of Iowa, "ICON Mobile Device Use Survey Results," University of Iowa, https://icon.uiowa.edu/support/statistics/ICON%20Mobile%20Device%20Survey.pdf

How do people use the m-library?



Keren Mills, "M-Libraries: Information Use on the Move," Arcadia Program, University of Cambridge. http://arcadiaproject.lib.cam.ac.uk/

How do people use the m-library?

Kent State University Library focus groups

- Library Databases
- Course reserve materials
- Patron's account
- Map of the library
- Ask a librarian

Jaimie Seeholzer and Joseph A. Salem, "Library on the Go," College & Research Libraries, (forthcoming).

Away from the “bleeding edge,” or,

LESSONS FROM MOBILE COMPUTING INITIATIVES

Our context

- Small Upper-Midwestern state university
  - 6023 undergraduate students
  - 3268 graduate students
- Flagship, liberal-arts campus in 6-school system
- Carnegie DRU classification
- Faculty-to-student ratio = 1:14
- Undergraduate classes with less than fifty students = 94%
- Classes have less than thirty students =75%

Our context

USD's vision statement (2005):

"At USD, students are inspired to become ***lifelong learners*** who will make significant contributions through leadership and service as citizens of the state, the nation, and the world."

Our context

USD's educational outcomes (2005):

"The University of South Dakota is a ***learning-centered*** institution…Every student, undergraduate or graduate, regardless of major or program of study shall: achieve competence in communication, analysis, quantitative reasoning, and ***information literacy***; acquire deep knowledge of at least one discipline or program area; gain ***problem solving skills*** that transcend discipline boundaries; develop a tolerance for ambiguity and complexity; commit to ***ethical conduct***; become open to diverse people, ideas, and experiences; be dedicated to the ***ideals of democracy and freedom***; and recognize his/her responsibilities as a ***global citizen***."

Our context

BOR System General Education Goals (2005):

1. Writing
2. Speech
3. Social Sciences
4. Arts and Humanities
5. Math
6. Science
7. Information Literacy

Palm Initiative, phase 1 (2001-3)

- incoming freshmen and law and medical students received Palm m500 at greatly reduced cost
- mandated inclusion of Palm in teaching of general-education courses (English Composition, Speech Communication)
- expectation of library support via both IL instruction and (especially) software support

Palm Initiative, phase 1 (2001-3)

- Library support of Palm initiative
  - teaching of workshops on academic functions and uses of the Palm to faculty and students
  - creation of downloadable "survival guides" for English and Speech in .pdb and .pdf format
  - creation of a manual, *Beyond the Four Functions: Academic Uses of the Palm m500* (published in ERIC)

Palm Initiative, phase 1 (2001-3)

- why the Palm Initiative failed:
  - top down implementation
  - Palm Steering Committee lacked ENGL and SPCM faculty as members
  - lack of preparation of relevant faculty (most of whom were graduate teaching assistants)
  - technology, not pedagogy, drove the instruction
  - no meaningful integration into learning activities or courses
  - Steering Committee ignored suggestions of Palm User Group

Palm Initiative, phase 1 (2001-3)

- why the Palm Initiative failed:
  - no student buy-in
  - devices not already being used by students
  - required student-owned computer for synching (c. 40% of students owned computers)
  - presence of non-freshman in freshman courses ("haves" vs. "have-nots" limited use of devices)
  - design flaws/limitations to usefulness of devices

Palm Initiative, phase 2 (2003-4)

- Improvement
  - cool, user-friendly device (Zire71)
  - limited student test group (Honors students)
  - faculty volunteers recruited to integrate Palms in courses
  - more integration into courses, e.g., quiz review, use in speech peer evaluation (beaming = "gee whiz" factor)

Palm Initiative, phase 2 (2003-4)

- Continuing problems
  - top down implementation
  - devices not already being used by students
  - lack of faculty familiarity with appropriate pedagogies
  - little meaningful integration into learning activities

SDBOR Mobile Computing Initiative (2009)

"The Board of Regents recognizes the potential disconnect in the near future between the state's high schools and the Regental institutions and that the institutions need to move in concert with K-12 schools. From a practical standpoint, the system's teacher education programs are already moving to prepare candidates who have experience in and can work in the laptop/tablet high schools. Clearly, the system needs to establish a leadership role in this process and ***this role needs to play out in all of the manners through which the universities commonly provide educational services.*** "

Mobile Computing Initiative, 2009-

laptopnext.com/tag/intel-centrino-2/

- Improvements
  - faculty provided with laptops and training in appropriate pedagogies
  - campus-wide wireless environment
  - students not restricted to specific laptops (e.g., tablet PC)
  - benefit from research/case studies
- Continuing challenges
  - restricted to laptops
  - no support for handheld devices or smart phones
  - BOR mandate seems to be more about meeting student expectations (marketing) than effective teaching and learning

Research: Key resources on mobile computing

Jan Herrington, Anthony Herrington, Jessica Mantei, Ian Olney and Brian Ferry (editors), **New technologies, new pedagogies: Mobile learning in higher education**, Faculty of Education, University of Wollongong, 2009, 138p. ISBN: 978-1-74128-169-9 (online).

http://ro.uow.edu.au/newtech/

Patten, B., Arnedillo Sanchez, I., & Tangney, B. (2005). Designing collaborative, constructionist and contextual applications for handheld devices. *Computers &Education, 46, 294-308.*

Potential uses of mobile devices in higher education

- Administration, e.g., the use of calendars, exam reminders, grading software
- Reference, e.g., dictionaries, e-books and office applications;
- Interaction, e.g., quizzes, response software
- Microworld, e.g., simulations, games
- Data collection, e.g., data logging, note taking, audio recording, eportfolios
- Location awareness, e.g., augmented environments, gps navigation and tagging
- Collaboration, e.g., pod/vodcasting, blogging, instant messaging

Patten, B., Arnedillo Sanchez, I., & Tangney, B. (2006). Designing collaborative, constructionist and contextual applications for handheld devices. *Computers in Education, 46, 294-308.*

Potential uses of iPods in higher education

Belanger (2005) identified five categories of iPod use in academic settings:

- Course content dissemination
- Classroom recording
- Field recording
- Study support
- File storage and transfer

Belanger, Y. (2005). *Duke University ipod first year experience final evaluation report. Durham, North Carolina, USA: Duke University.*

Importance of faculty development in technology initiatives

Despite the significant potential of mobile technologies to be employed as powerful learning tools in higher education, ***their current use appears to be predominantly within a didactic, teacher-centred paradigm,*** rather than a more constructivist environment. It can be argued that ***the current use of mobile devices in higher education (essentially content delivery) is pedagogically conservative and regressive***. Their adoption is following ***a typical pattern where educators revert to old pedagogies as they come to terms with the capabilities of new technologies***, referred to by Mioduser, Nachmias, Oren and Lahav (1999) as ***'one step forward for the technology, two steps back for the pedagogy'*** (p. 758).

Jan Herrington et al., "Using mobile technologies to develop new ways of teaching and learning," p. 2

Importance of faculty development in technology initiatives

When introducing new technology into courses, faculty tend to regress in their teaching

-uncertain about integrating technology into courses

-need to push technology use

-often focus on teaching *about the* technologies themselves rather than *with* the technologies

-neglect how students can use devices as 'partners in cognition' to learn *with* rather than *from* technology

Result: more authoritarian, teacher-centered instruction that emphasizes technology over pedagogy.

Salomon, G. (1991). Partners in cognition: Extending human intelligence with intelligent technologies. *Educational Researcher, 20(3), 2-9.*

Recommendations based on research and experience

- Learn from the “big boys”; avoid the “bleeding edge”
- Pedagogy trumps technology
- Professional development in pedagogy is key
- Avoid top-down imposition of technology mandates
- Promote and reward bottom-up initiatives from faculty and staff
- Promote and reward active, authentic, situated teaching (with/without technology)
- Allow time for experimentation and reflection
- Don’t put all your “eggs” in the one-device “basket”

Design principles for mobile learning

1. **Real world relevance**: Use mobile learning in authentic contexts
2. **Mobile contexts**: Use mobile learning in contexts where learners are mobile
3. **Explore**: Provide time for exploration of mobile technologies
4. **Blended:** Blend mobile and non mobile technologies
5. **Whenever**: Use mobile learning spontaneously
6. **Wherever**: Use mobile learning in non traditional learning spaces
7. **Whomsoever**: Use mobile learning both individually and collaboratively
8. **Affordances**: Exploit the affordances of mobile technologies
9. **Personalize**: Employ the learners' own mobile devices
10. **Mediation**: Use mobile learning to mediate knowledge construction.
11. **Prod*use*:** Use mobile learning to produce and consume knowledge.

Herrington, A., Herrington, J. & Mantei, J. (2009). Design principles for mobile learning. In J. Herrington, A. Herrington, J. Mantei, I. Olney, & B. Ferry (Eds.), *New technologies, new pedagogies: Mobile learning in higher education (pp. 129-138). Wollongong: University of Wollongong.* Retrieved from http://ro.uow.edu.au/

BUILDING A MOBILE LIBRARY

http://www.flickr.com/photos/christchurchcitylibraries/3233049729

“don't convert, create!”

- determine what mobile services are needed and will be used
- don't just copy your existing website to a mobile version

Stuff to think about

- Needs assessment
- Integrating with existing library services
- Project planning
- Building the site
- Testing, marketing, launching
- Keeping up

Can we mobilize?

- MIT Mobile Web Open Source Project (display and device detection)

Sony K750
Web-enabled phone
“ Scroll”

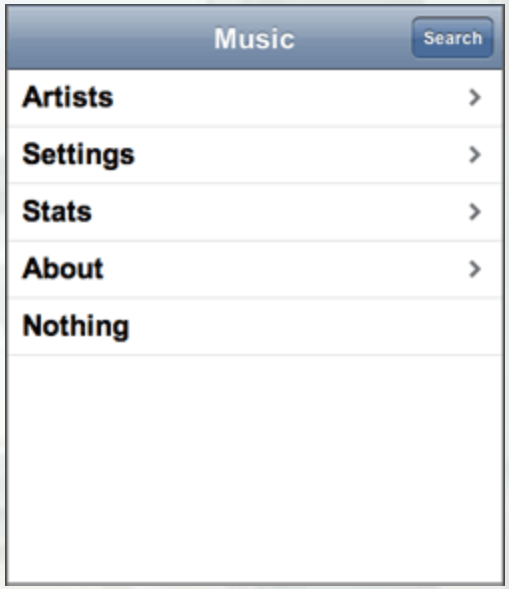
iPhone
smart phone
“Touch”

No developers?

- ***Free tools that require only HTML knowledge***
  - iUI http://code.google.com/p/iui/
  - Dashcode
  - http://iwebkit.net/
- Good for static content
- May lack good multi-tiered device support

iUI (Google – iPhones)

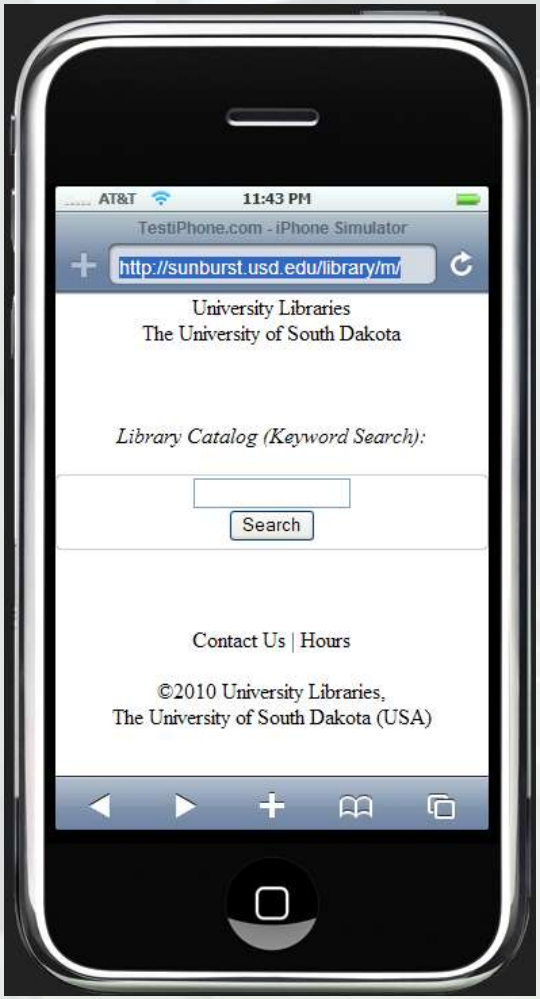
```
01. <html xmlns="http://www.w3.org/1999/xhtml">
02. <head>
03. <title>iUI Music Demo</title>
04.
05. <meta name="viewport" content="width=device-width; initial-scale=1.0; maximum-scale=1.0; user-scalable=0;"/>
06. <style type="text/css" media="screen">@import "../iui/iui.css";</style>
07. <script type="application/x-javascript" src="../iui/iui.js"></script>
08. </head>
09. <body>
```




```
01. <div class="toolbar">
02.     <h1 id="pageTitle"></h1>
03.     <a id="backButton" class="button" href="#"></a>
04.     <a class="button" href="#searchForm">Search</a>
05. </div>
06.
07. <ul id="home" title="Music" selected="true">
08.     <li><a href="#artists">Artists</a></li>
09.     <li><a href="#settings">Settings</a></li>
10.     <li><a href="stats.php">Stats</a></li>
11.     <li><a href="http://code.google.com/p/iui/" target="_self">About</a></li>
12.     <li>Nothing</li>
13.
14. </ul>
15.
```

Simple do-it-yourself (Dreamweaver)

```
<html>
<head>
<title>University Libraries (Mobile site)</title>
<meta http-equiv="Content-Type" content="text/html; charset=iso-8859-1">
<meta name=HandheldFriendly content=true>
</head>
<body>
<p><center>
  <p>University Libraries<br>
    The University of South Dakota  </p>
  </center><br><br></p>
<p><center>
    <i>Library Catalog (Keyword Search):</i>
</center></p>
<p><center><form method="get" name="form1" action="http://apollo.sdln.net:80/F/">
<fieldset>
<input type="hidden" name="func" value="find-b" />
<input type="hidden" name="local_base" value="usd" />
<input type="hidden" name="filter_code_1" value="WLN" />
<input type="hidden" name="filter_code_2" value="WYR" />
<input type="hidden" name="filter_code_3" value="WYR" />
<input type="hidden" name="filter_code_4" value="WFM" />
<input type="hidden" name="filter_code_5" value="WSL" />
<input type="hidden" name="filter_code_6" value="WFM" />
<input type="hidden" name="filter_code_6" value="WFM" />
<input type="hidden" name="find_code" value="WRD" />
<input type="hidden" name="filter_request_4" value="" />
<label for="keyword"><input size="15" maxlength="200"  name="request" value="" /> <br>
<input type="submit" value="Search">
</fieldset>
</form></center><br><br></p>
<p><center>
    Contact Us | Hours
</center><br></p>
<p><center>
    &copy;2010 University Libraries, <br>
    The University of South Dakota (USA)
</center></p>
</body>
</html>
```

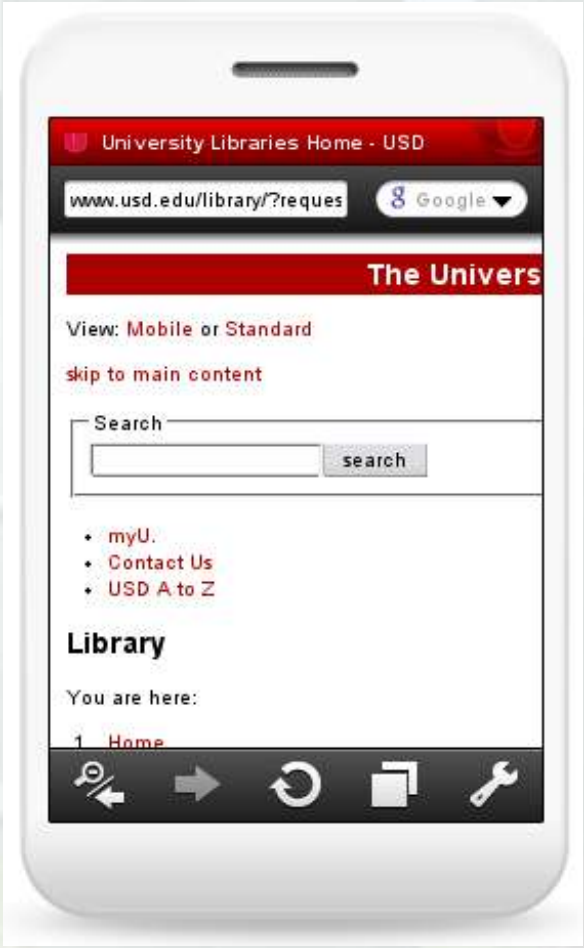


Testing

1) Test your mobile application on your desktop to ensure functionality. Mozilla's Firefox has add-ons that you can use to manipulate the UserAgent.
2) Test on browser simulators and device emulators.
3) Test on actual devices. Keep a list of people that have different devices; or go to the nearest T-Mobile store.

How can I test if I don't have a mobile device?

http://www.testiPhone.com



http://www.opera.com/mini/demo/

http://emulator.mtld.mobi/emulator.php

Where are we going-what are we doing?

- Provide access to several mobile applications & databases. Inform stakeholders of resources (LibGuide mobile info).
- Look at other mobile library sites (M-Libraries).
- Ask for code / ask how others created their sites.
- Needs assessment stage. Who are our key stakeholders / who uses mobile?
- Work closely with rest of campus on mobile initiative; make sure Libraries have seat at “table”.

Q's

- Why should I put effort into a mobile library site, just to serve a small handful of people?
- With better mobile browsers that are platform-independent, can't users access full web versions of resources on their mobiles? (Why build a separate site just for mobile?)
- Licensing and installation models of mobile library resources are all over the place.
  - Some require setting up a personal account
  - Authentication can be a hassle
  - Some need a serial number for installation

MEDICINE – HEALTH – MOBILE TECHNOLOGY


Reboot in progress...

How do you want medicine to be “practiced” on you?

Past

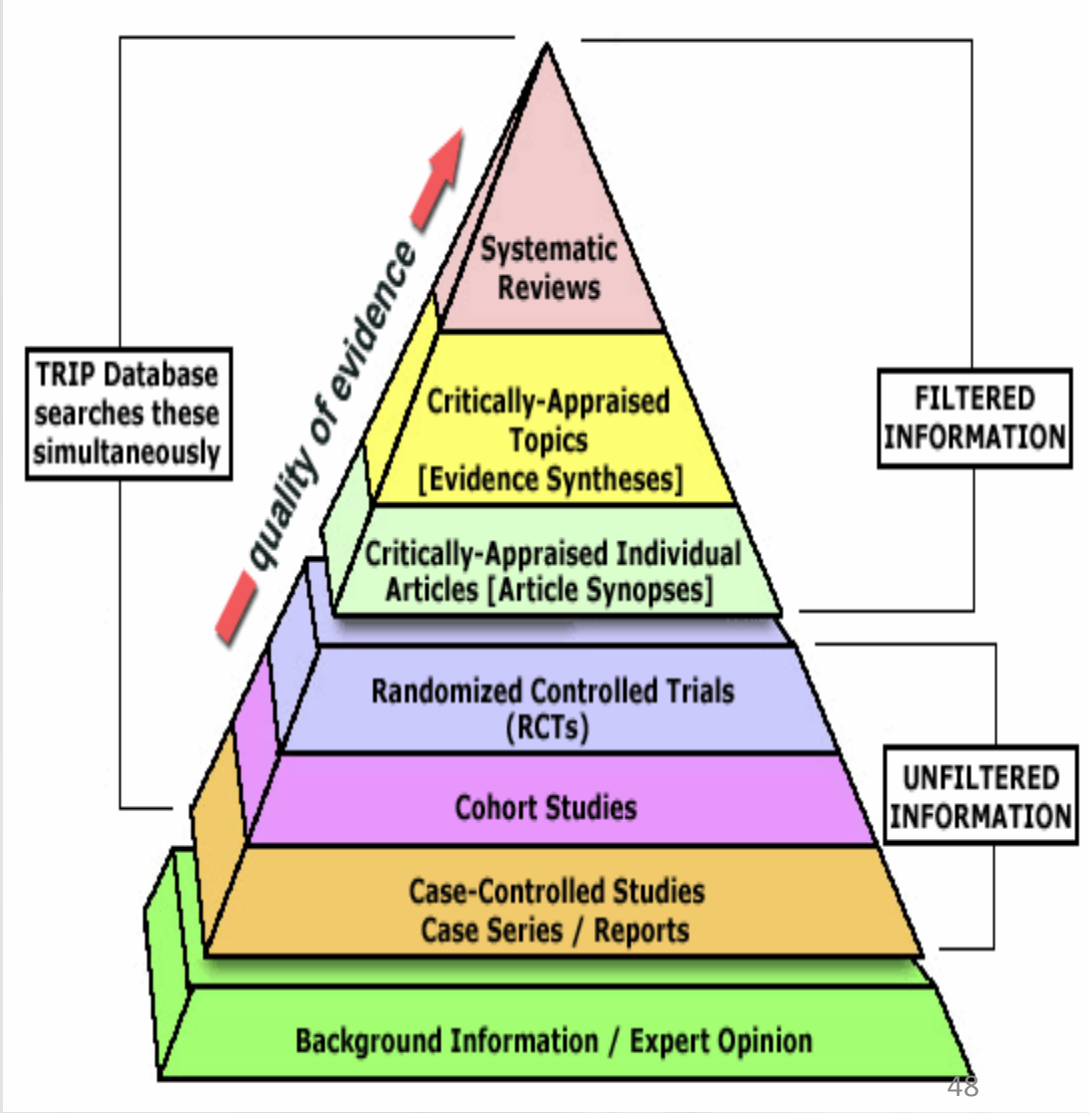
- Textbooks
- Monographs
- Research Articles
- Anecdotes
- Personal experience

Recent Past (late 90's)

- Textbooks
- Monographs
- Research Articles
- Databases (Medline)
- Micromedex
- Diagnostic Imaging
- Palm

Evidence Based Medicine 2000 -

- Same research
- Same sources
- Meta-analysis
- Clinical trial data
- Synthesis
- Peer review
- Best Practices

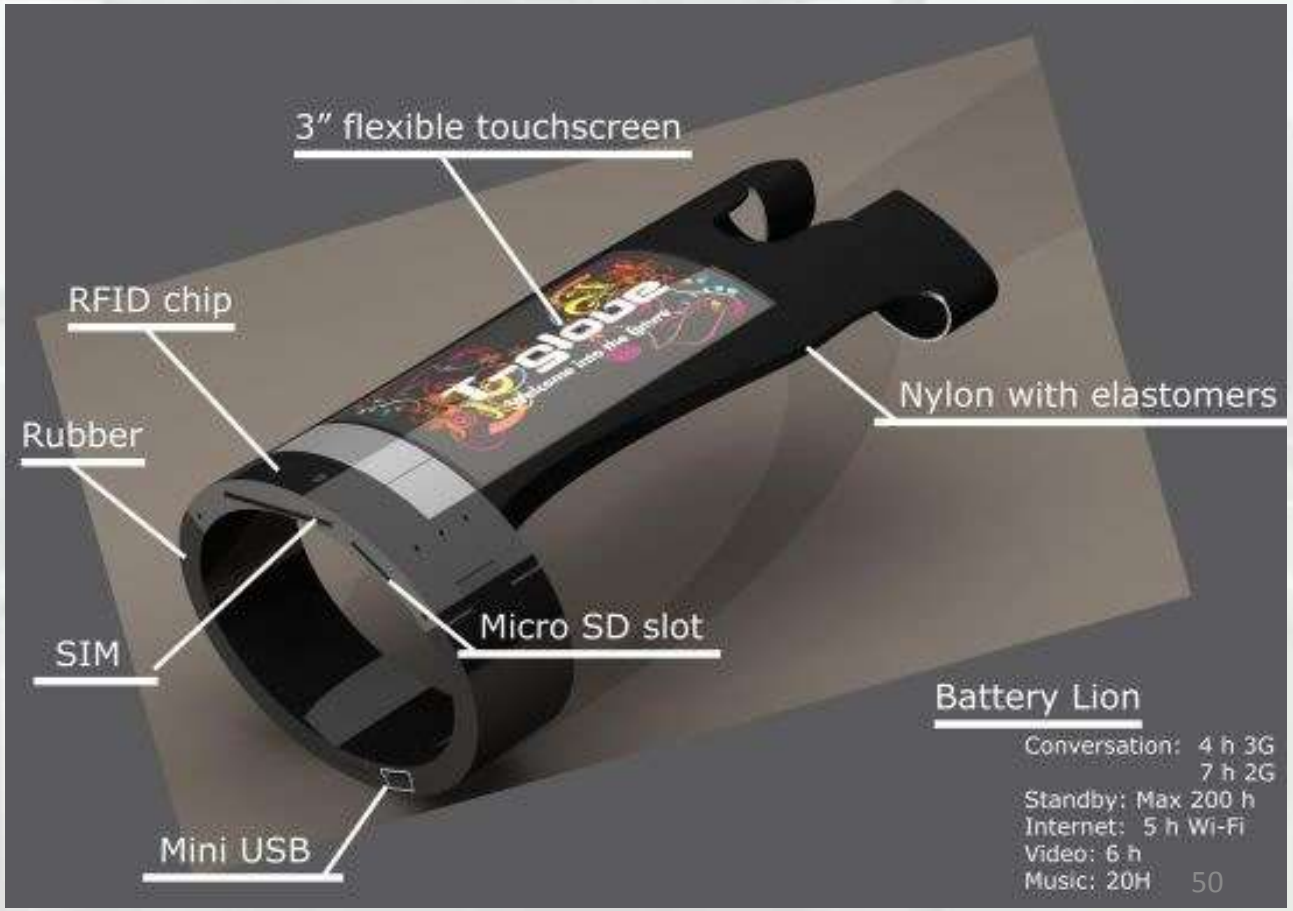


Present

- Same research
- Same sources
- Evidence Based Practice
- Mobile devices
- Smart Phones
  - MD Consult
  - Epocrates
  - Dynamed
  - Medlineplus

Future

- Better devices with improved diagnostic imaging results
- Immediate data retrieval
- Improved decision algorithms
- Better Care



But…

Future redux . . .

- Point of Care improves with:
  - Rapid access
  - Immediate diagnostics
  - Better synthesis
- Mobile devices send
- Mobile devices deliver

Evolution

And one device shall rule them all!

Consolidation

Speed

Accuracy