

California Digital Library

# Mobile Research Findings



University of California

**CDL**

California Digital Library

Rachael Hu, User Experience Design Manager

*Rachael.Hu@ucop.edu*

Alison Meier, Mobile Strategy Intern

*AlisonM@ischool.berkeley.edu*

**August 12, 2010**

August 4, 2010 9:58 AM PDT

# Android hits top spot in U.S. smartphone market

by Lance Whitney

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## AT&T sold out of iPhone 4 pre-orders for launch day

By Chris Ziegler posted Jun 15th 2010 5:46PM

## Underwhelming BlackBerry spells doom for RIM

Looks like the smart phone industry's 800-pound gorilla is losing weight

APP SMART

### Seeing the World Around You Through Your Phone

By BOB TEDESCHI

Published: July 28, 2010

## iPhone 4 Gets 'Thumbs Down' from Consumer Reports

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### Life and death of Microsoft Kin: the inside story

By Chris Ziegler posted Jul 2nd 2010 4:30PM

FEATURE

## Jailbreaking Is No Longer Illegal

7/26/10 at 4:08 PM | 3 Comments

TECH SMART | AUGUST 4, 2010, 7:58 A.M. ET

## Getting Customers to 'Check In' With Foursquare

FILED UNDER [Tablet PCs](#)

## Apple has sold three million iPads in 80 days

By Laura June posted Jun 22nd 2010 11:24AM

### Emirates to Cut Data Services of BlackBerry



JULY 29, 2010, 5:40 PM ET

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## Underwhelming BlackBerry

### spells doom for RIM

# It's the summer of mobile

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JULY 29, 2010, 5:40 PM ET

## Google Disables Android Apps Caught Collecting Personal Data

**“We are just at the beginning of a new wireless era where smartphones will become the standard device consumers will use to connect to friends, the internet and the world at large”**

**—The Nielsen Wire, 2010**

# Why does mobile matter to CDL?



## Planning for a Mobile S

Six steps to going mobile at your library

## Making the case for a fully mobile library web site: from floor maps to the catalog

Text Messaging the Reference  
Using Upside Wireless' SMS  
to Extend Reference Se

Undergraduates and the  
Mobile Revolution

M-Libraries: Information use on the move

## Opportunities for Mobile Library Services:



The use of handheld mobile devices: their impact and implications for library services



# Why does mobile matter to CDL?

- Growing proliferation of mobile devices, mobile library projects, and literature in the academic landscape

M-Libraries: Information use on the move

Opportunities for **Mobile** Library Services:

The use of handheld mobile devices: their impact and implications for library services



THINGS YOU SHOULD  
MOBILE IT

# Why does mobile matter to CDL?

- Growing proliferation of mobile devices, mobile library projects, and literature in the academic landscape
- Campuses expressed need for guidance

Opportunities for MOBILE LIBRARY  
Library Services

The use of handheld mobile devices: their impact and implications for library services





# Why does mobile matter to CDL?

- Growing proliferation of mobile devices, mobile library projects, and literature in the academic landscape
- Campuses expressed need for guidance
- Looking for new ways to meet users' needs



**“I am glad to see CDL take this on. It is crucial for CDL to leverage its reputation to encourage vendors to make licensed library resources accessible on mobile devices.”**

**— Librarian**

# Introduction



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THIS IS A BOOK TRAVELLING THROUGHOUT THE GLOBE  
REACHING FRIEND AFTER FRIEND, TESTING AND  
SOMETIMES STRENGTHENING BONDS.

it relies on the effort, but more especially  
on the belief of these people. The belief  
that the person on the other side is  
real, on the belief they can communicate  
and contribute with a little push and  
a little time so this can keep going.  
Until there are no pages left blank.  
Until a whole story is written in  
different places, ~~by~~ <sup>BY</sup> different hands.  
BECAUSE THIS IS HOW HISTORY IS WRITTEN,  
in smaller or larger scales.

20/9/2006  
CTA

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ALEXANDRE ROMEIROS-CARAL PIMENTA-ADVOGADO RUA DO CARMO

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# Overview of Presentation

- Goals of project
- Methodology
- Findings
- Recommendations
- Questions

# How did we do this?

- Literature review
- Comparative analysis
- Review UC campus efforts
- Surveys
- Interviews

# How did we do this?

- Literature review
- Comparative analysis
- Review UC campus efforts
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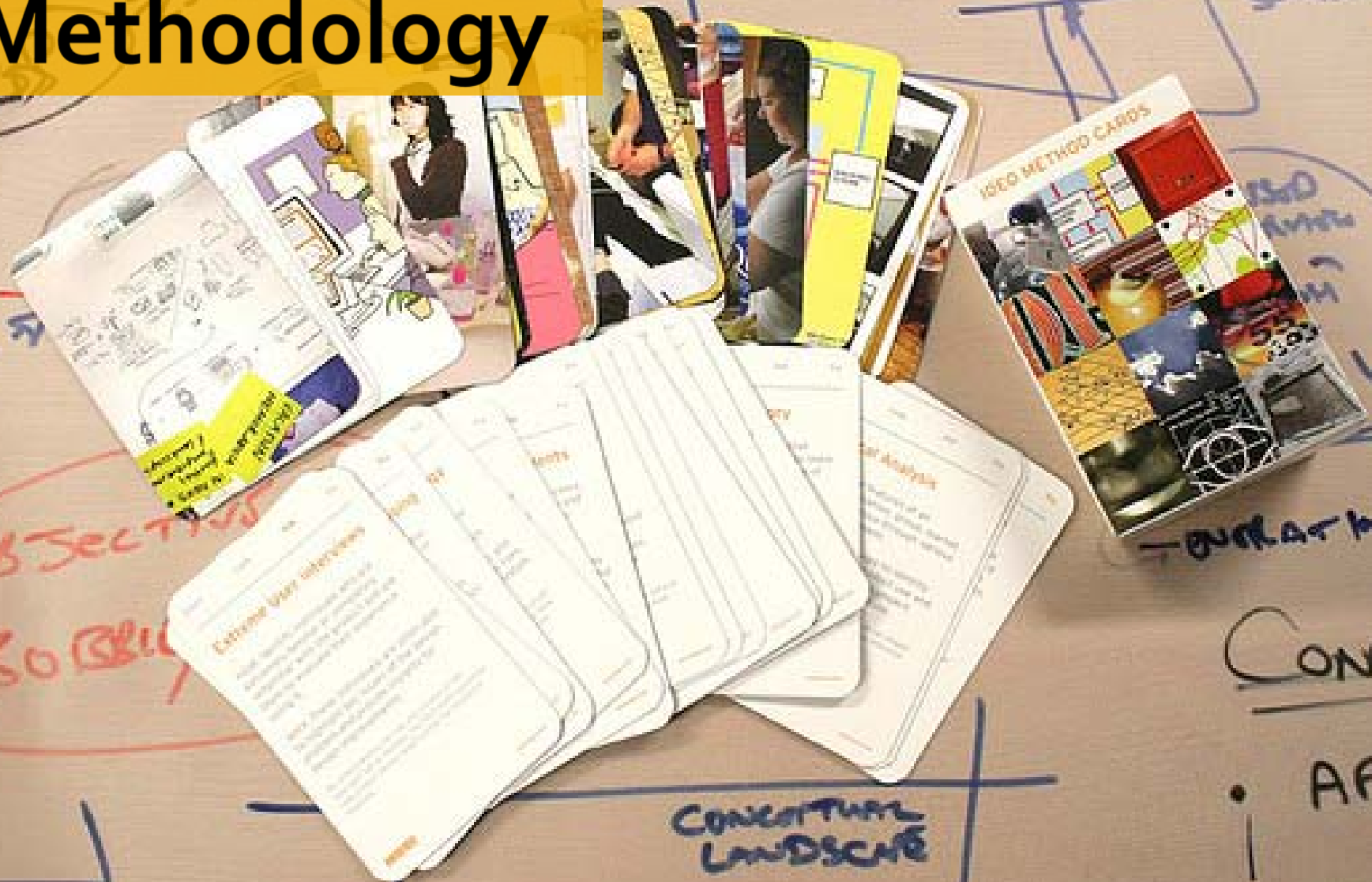
# How did we do this?

- Literature review
- Comparative analysis
- Review UC campus efforts
- Surveys
- Interviews



*Details in  
full report  
and on wiki*

# Methodology





# Experiment with new ways to reach users

- Facebook ad
- Announcements on different CDL Facebook and Twitter accounts
- Working with Institutional Research Groups

# Survey 1: Librarians

- 27 Librarian respondents

UC Irvine	12
OCLC	3
California Digital Library	2
UC Berkeley	1
UCLA	1
UCR	1
UCSD	1
Other university	5
Not answered	1

# Survey 2: Academics

- Distributed to faculty, graduate students, and undergraduate students at UC Berkeley

Faculty	92	32%
Graduate	63	22%
Undergraduate	101	35%
Other	12	4%
Not stated	18	6%
<b>Total</b>	<b>286</b>	

# Survey 2: Academics

- Respondents from a mix of disciplines

Natural sciences	74	26%
Social sciences	65	23%
Humanities	59	21%
Formal sciences	47	16%
Professional	19	7%
Not stated	22	8%

# Interviews



- 10 on-campus interviews at UCSF, UC Berkeley, and UC Davis
- 4 phone interviews: special collections librarian, 2 K-12 educators, and a faculty member

UCSF	Staff, Clinical Fellow	Health/medicine
UCSF	Faculty	Health/medicine
UCSF	Student, 4 <sup>th</sup> year PhD	Health/medicine
UCSF	Archivist	N/A
UC Berkeley	Student, 2 <sup>nd</sup> year undergraduate	Psychology
UC Berkeley	Student, First year PhD	Biology
UC Berkeley	Student, 4 <sup>th</sup> year PhD	Information Science
UC Davis	Student, 3 <sup>rd</sup> year undergraduate	Sociology and health/medicine
UC Davis	Student, 4 <sup>th</sup> year undergraduate	Art and history
UC Davis	Student, 3 <sup>rd</sup> year undergraduate	Biology
Other university	Teaching Librarian/Special Collections Librarian	N/A
K-12 School	8 <sup>th</sup> -grade teacher	History & English
High School District	Technology specialist	N/A
Other university	Faculty	Field ecology



# Findings





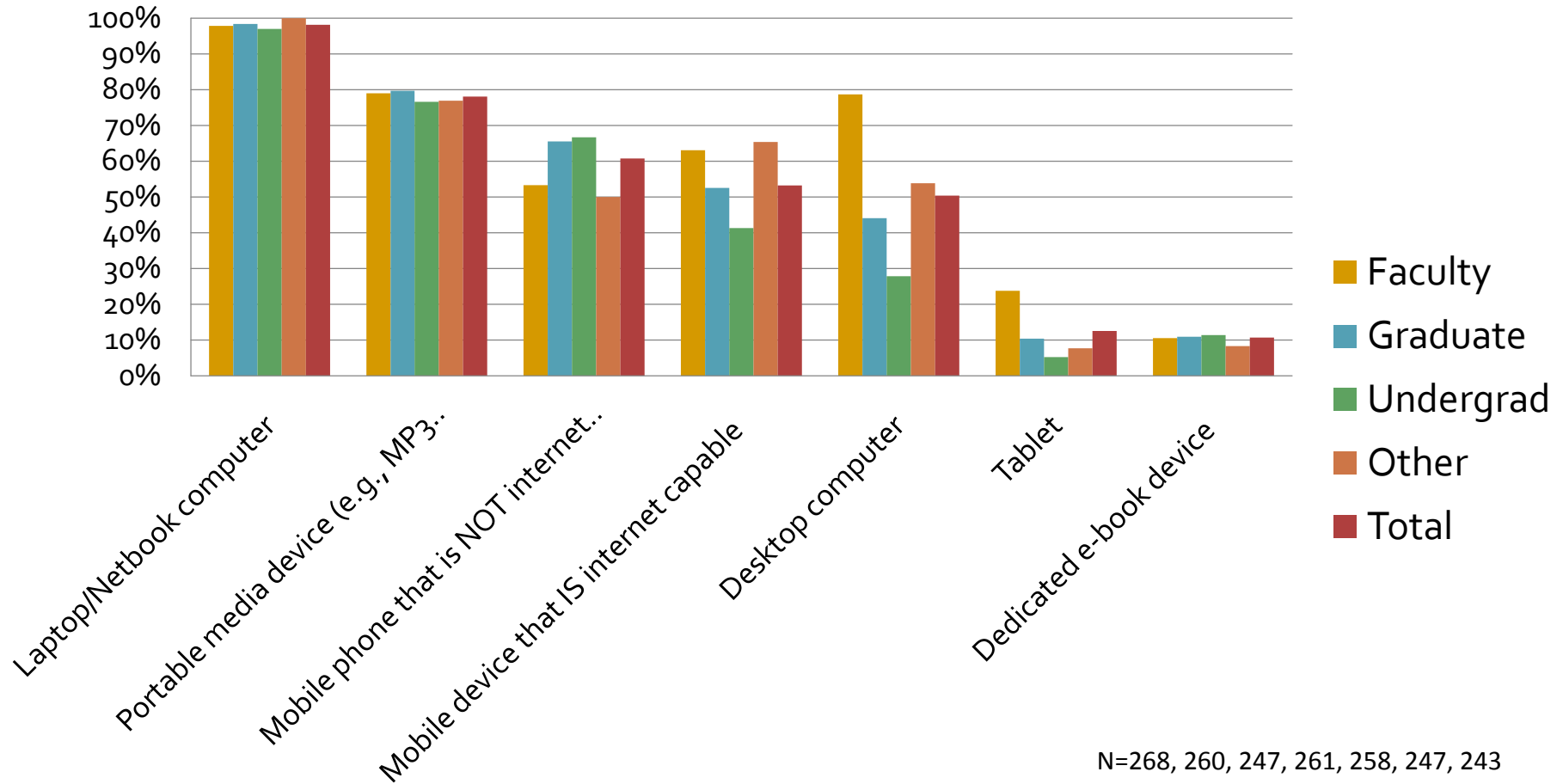
# Overview of findings

- Technology
- Activities
  - Finding information
  - Email and text messages
  - Academic activities
    - Reading
    - Research
- Reaching a mobile audience

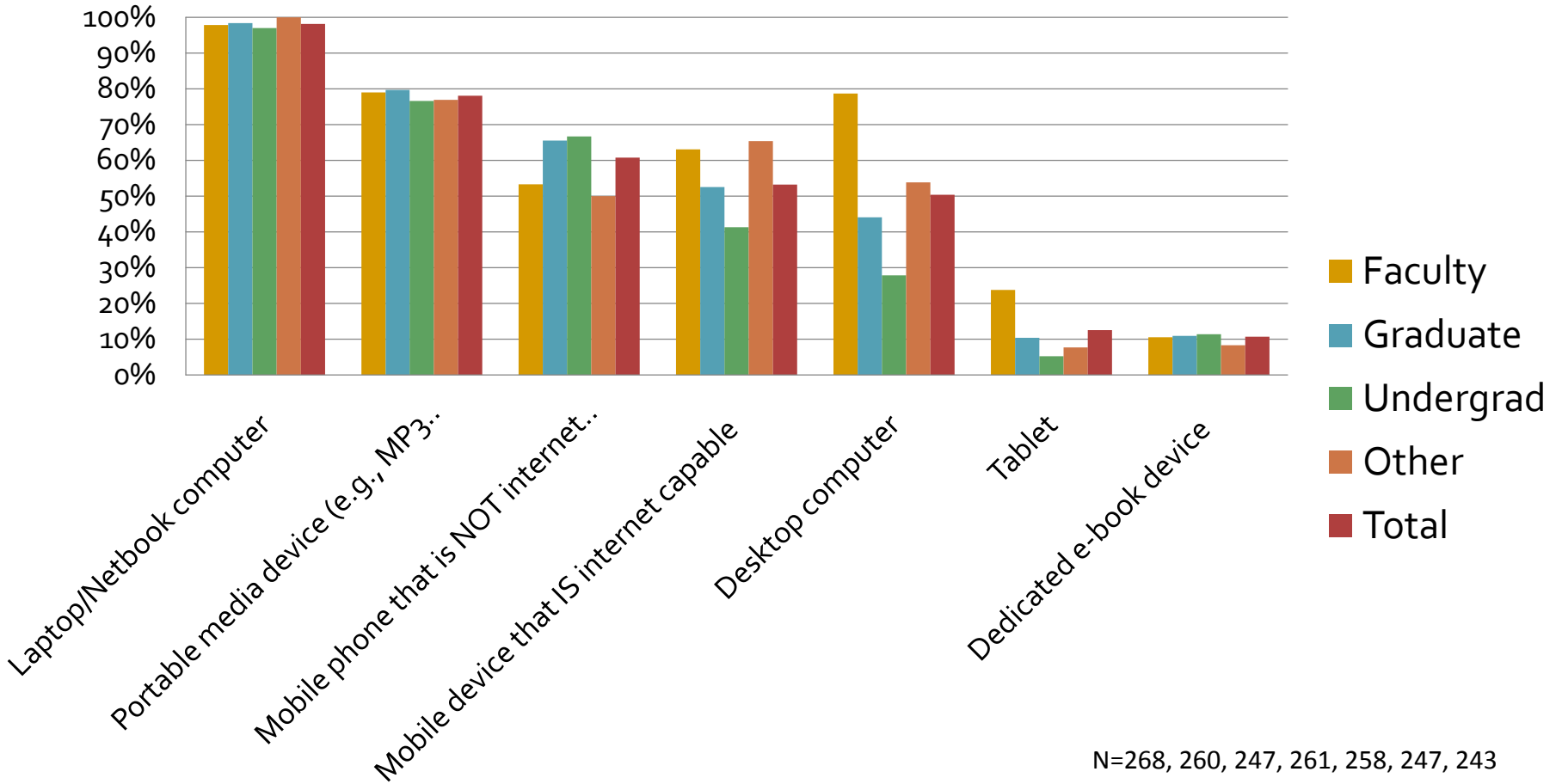
# Technology



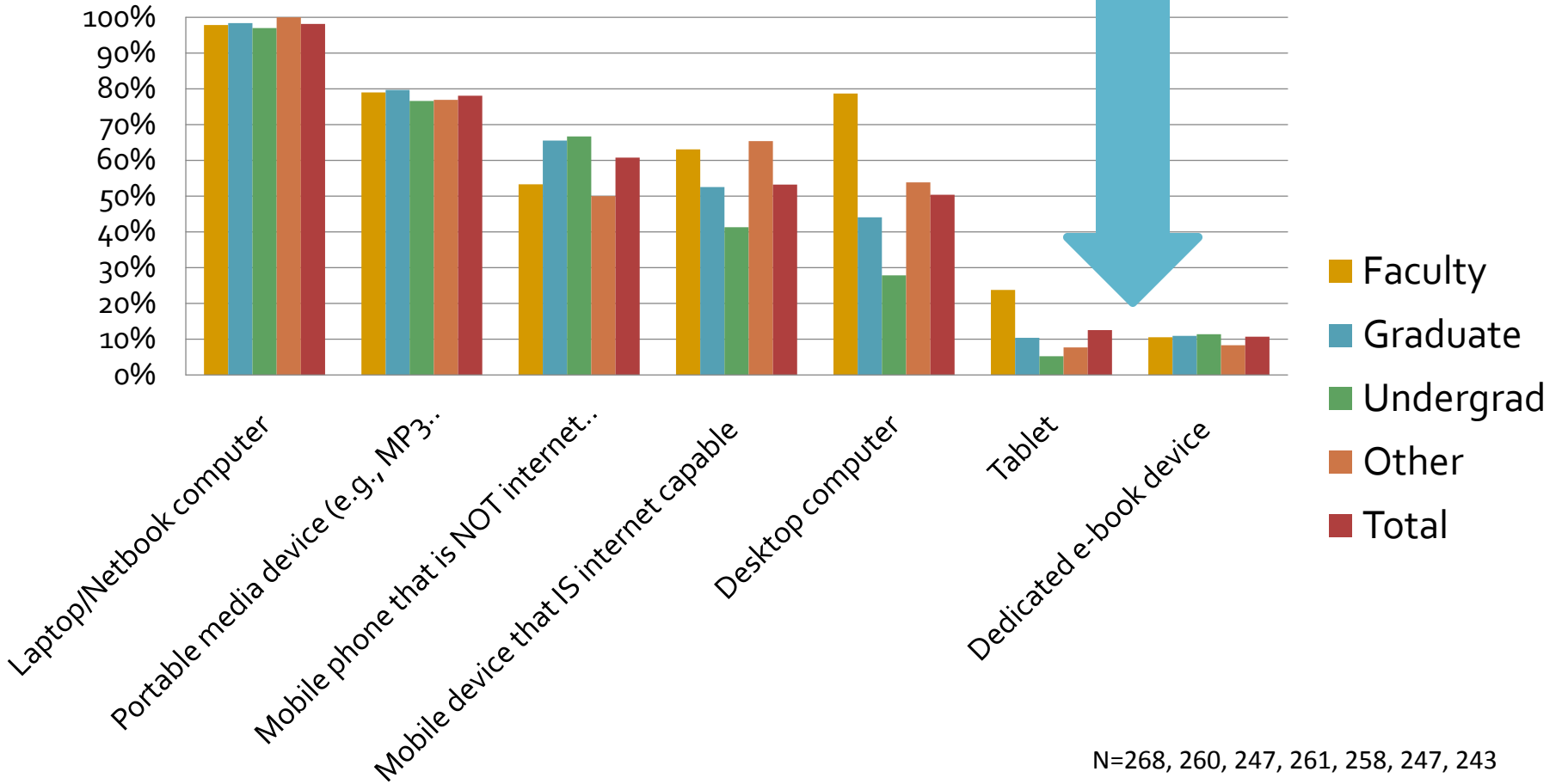
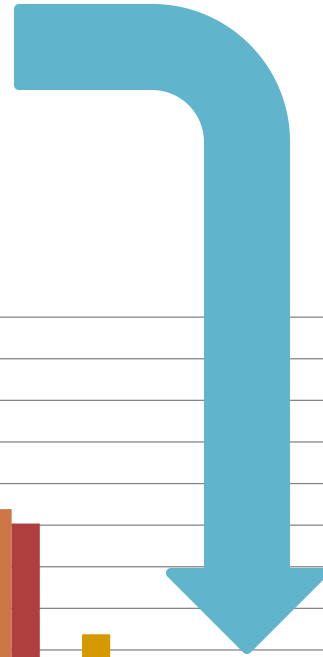
# Ownership of electronic equipment



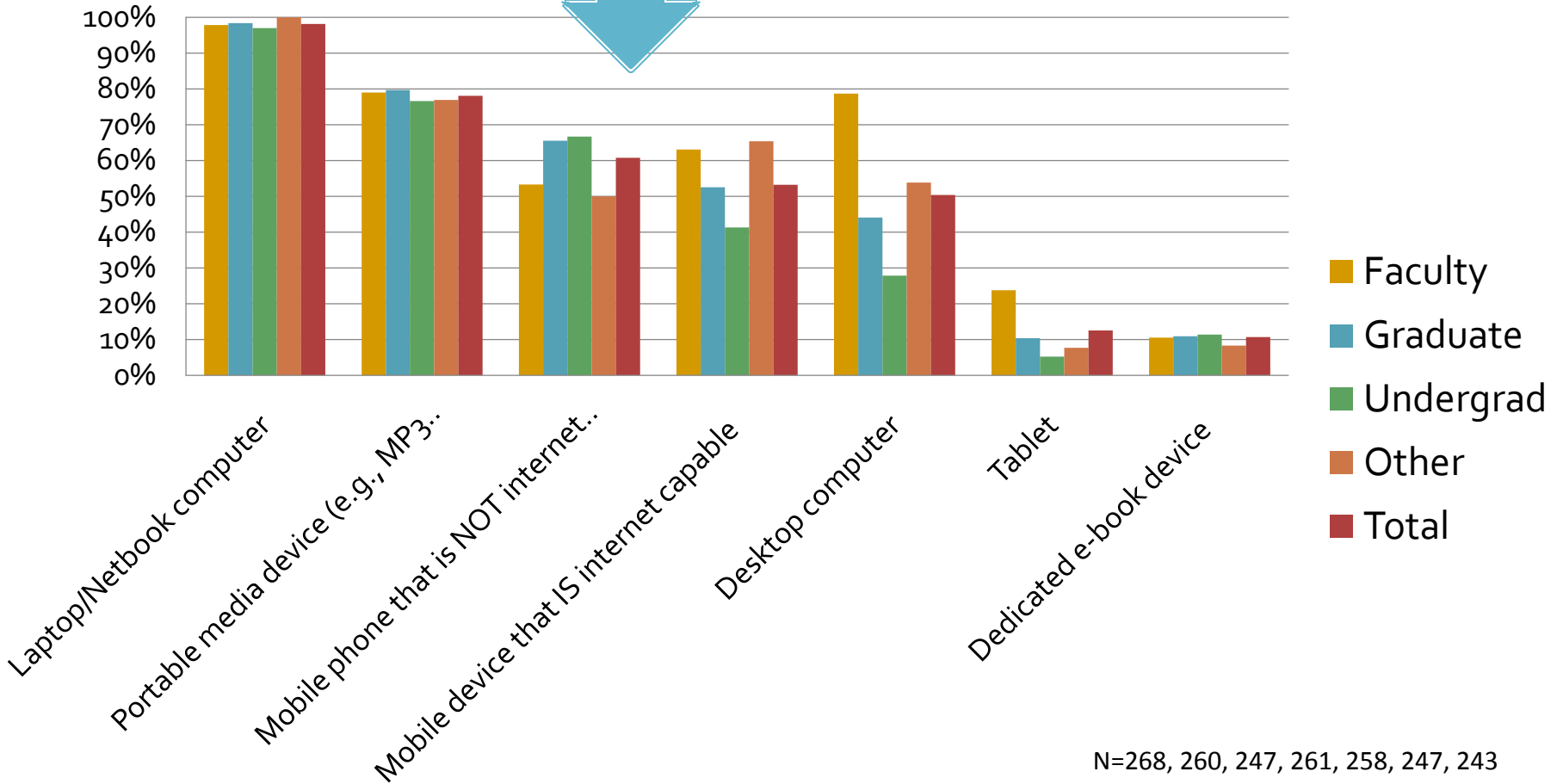
98% of survey respondents have laptops



Only 13% have tablet computers; 11% have eBook readers

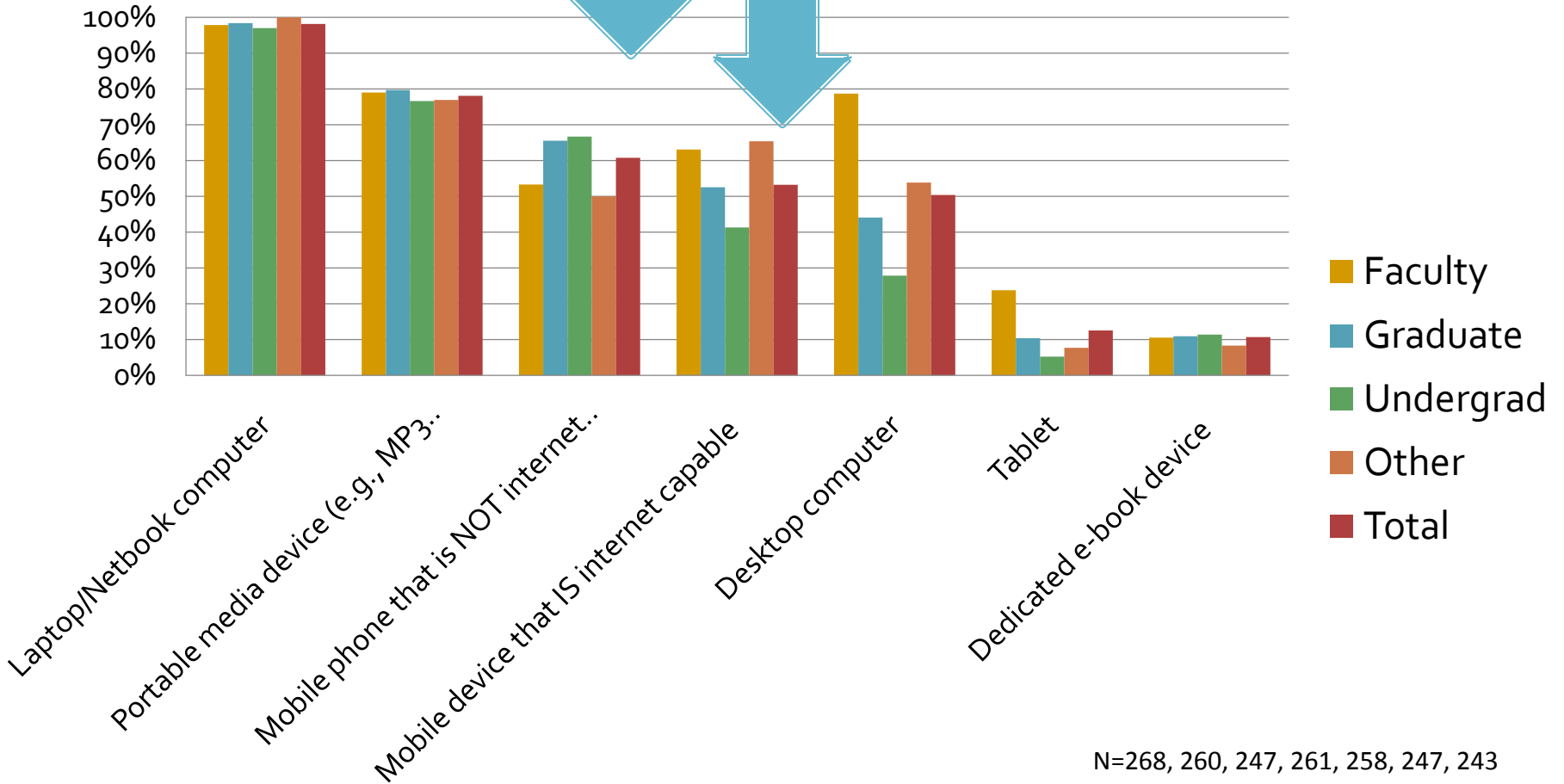


**61% have mobile phones that are NOT internet capable**



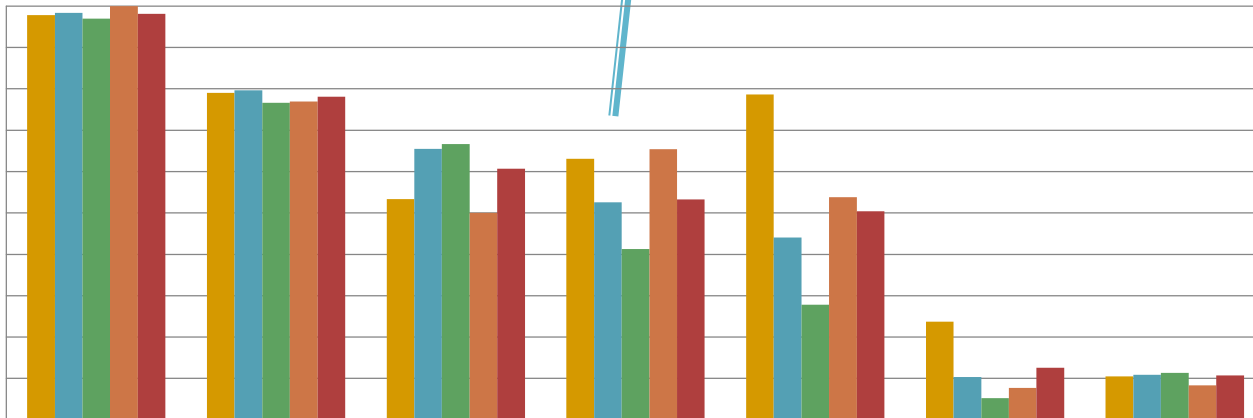
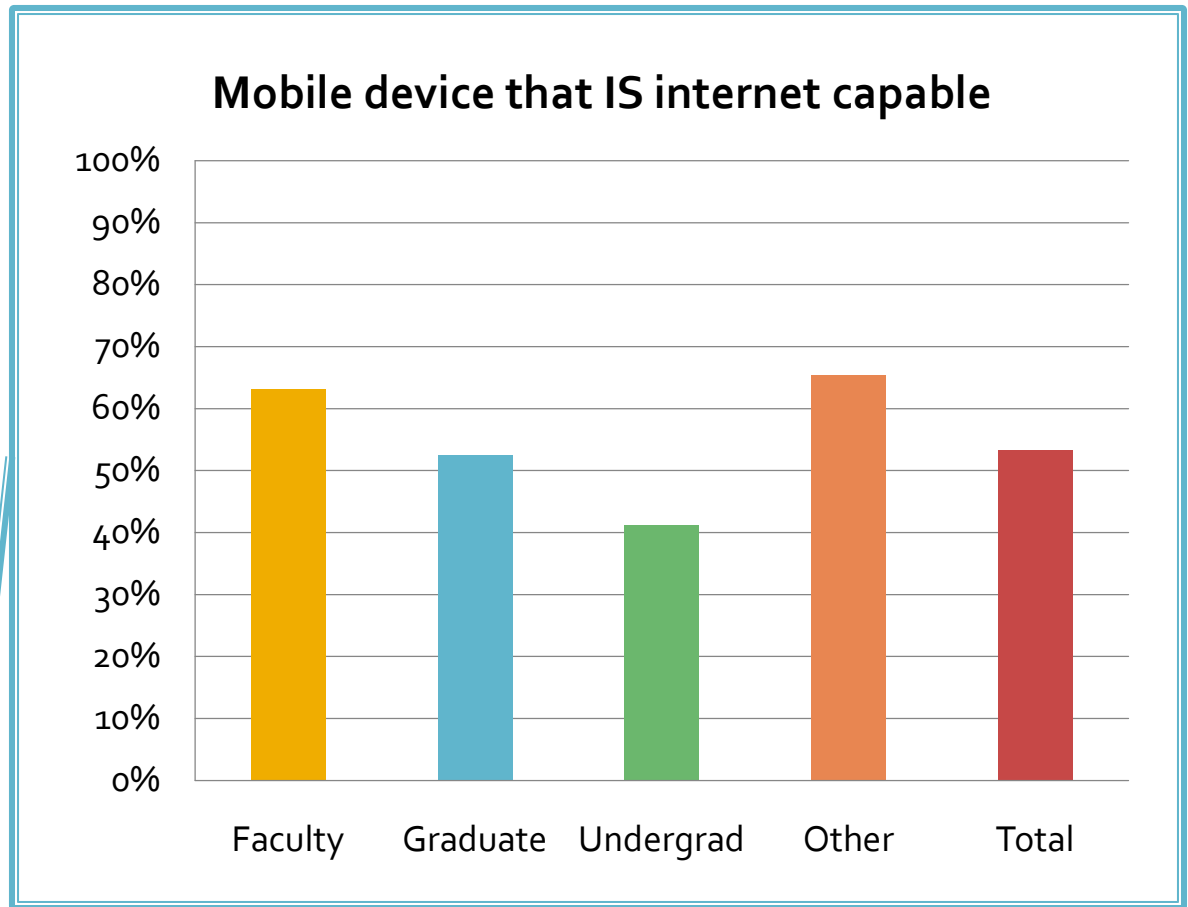
**61% have mobile phones that are NOT internet capable**

**53% have mobile devices that ARE internet capable**



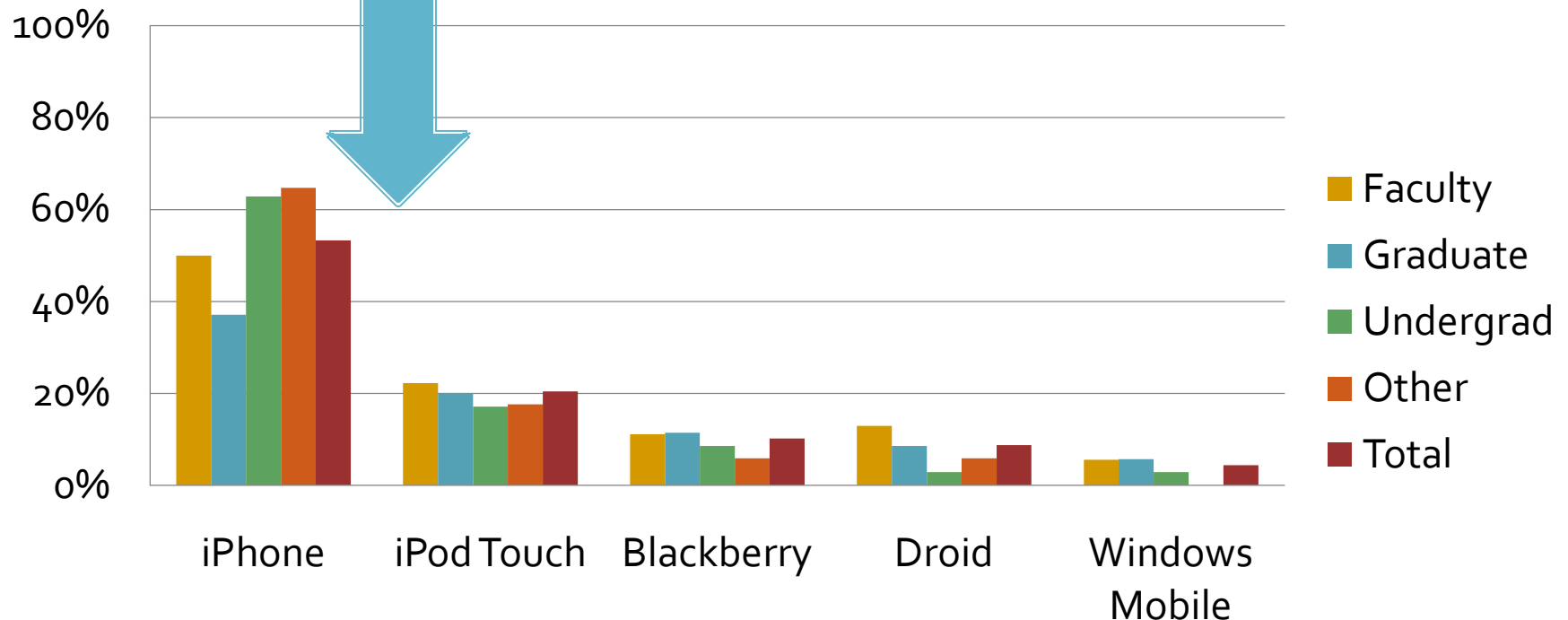


- Faculty are most likely to own (63%)
- Undergrads least likely (41%)



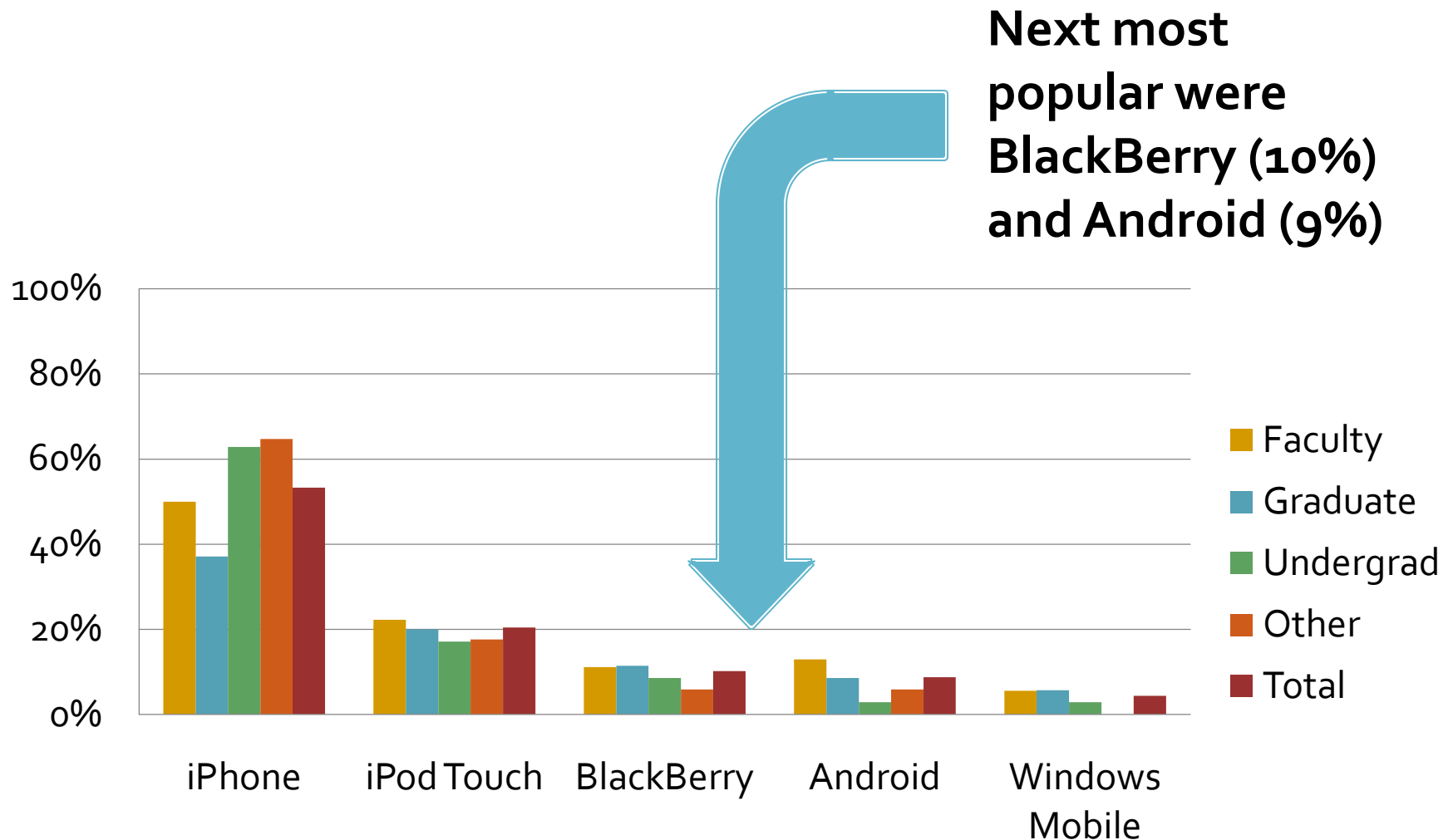
# Mobile Device with Internet Ownership

The majority of respondents own iPhone (53%) or iPod Touch (20%) devices



\* Out of people who own mobile devices with internet

# Mobile Device with Internet Ownership



\* Out of people who own mobile devices with internet

# But...

- **Not everyone has a smartphone**

**“I would use mobile devices for internet, but the prices they charge for data are way too high.”**

**— Librarian**

# But...

- And not everyone who has a smartphone has a data plan
- 23% of survey respondents who have an internet-capable device do not have data plans
- Primary reason: cost

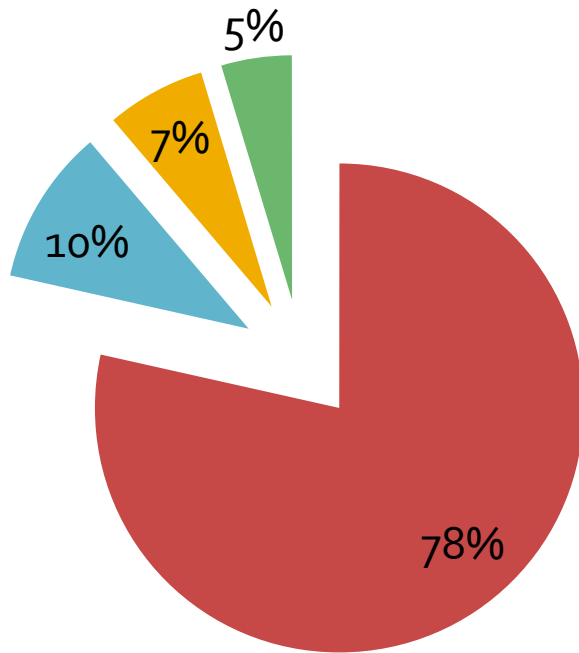
# Cellular vs. WiFi

- Using cellular connections instead of campus wireless networks may have significant implications for accessing licensed resources

# Cellular vs. WiFi

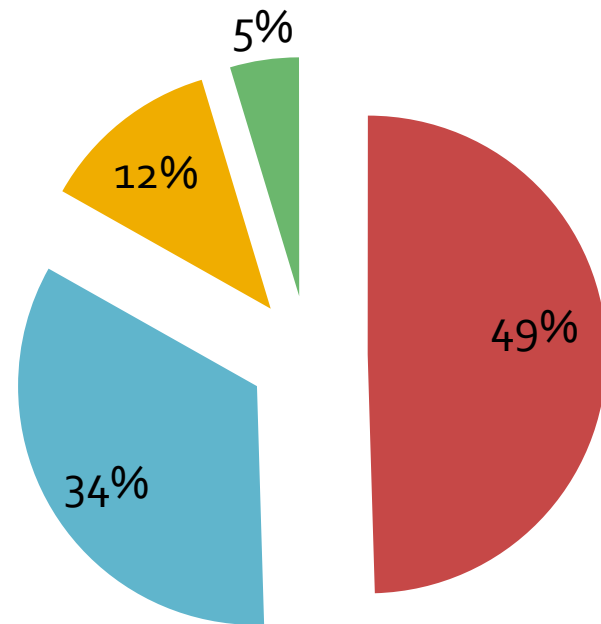
## Cellular Network

- Frequently
- Sometimes
- Never
- Not sure



## WiFi Network

- Frequently
- Sometimes
- Never
- Not sure



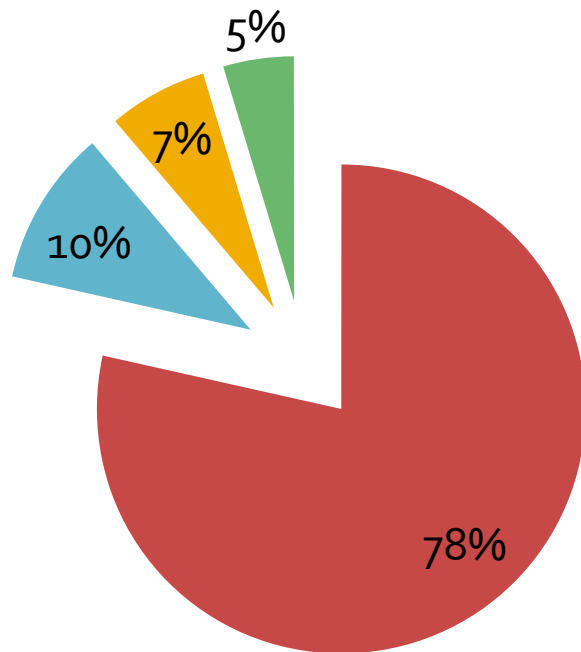


# Cellular vs. WiFi

- Accessing the internet by cellular connection is clearly more popular

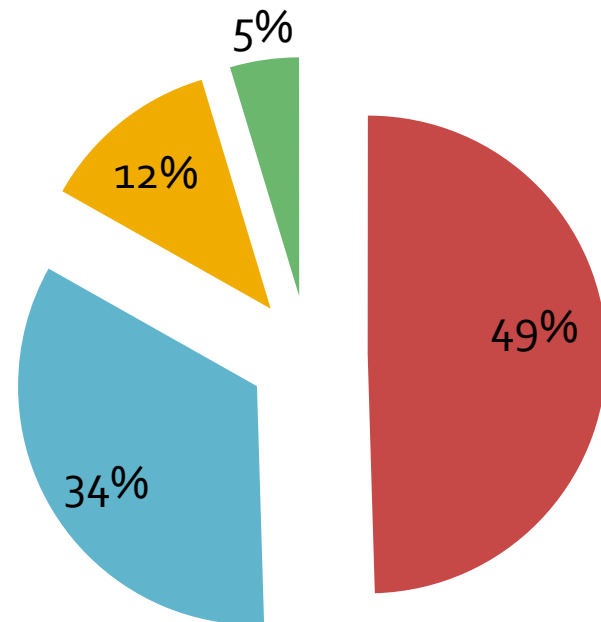
## Cellular Network

Frequently Sometimes  
Never Not sure



## WiFi Network

Frequently Sometimes  
Never Not sure



# Cellular vs. WiFi

**“I wouldn't go through all the hassle to use the internet at school. I just use the internet that AT&T provides.”**

**— Student**

# WiFi Difficulties

- Some try to access campus WiFi on mobile devices but struggle with VPN

# Cellular vs. WiFi

**“I do sometimes use the library for journals [on my mobile device], but I haven't gotten around the VPN issue to actually be able to pull up the articles.”**

**— Staff clinician**

# Using Devices



# People prefer to use laptops

**“[I use my phone to] check something, look at picture on the internet. If I’m going to do any extensive browsing or academic work, I’ll use my laptop.”**

**— Student**

**"I use them for very different things.  
If I've got my laptop with me, I  
would rarely use this [iPhone]. I  
would use this for very quick, like  
looking in the dictionary or  
something like that. Pretty much  
everything web-based I would use  
the laptop"**

**— Faculty at UCSF**

# But Mobile Devices Are Always Around

- People don't always carry laptops, even to class
- People don't always have internet access, even at home
- Mobile devices fill these gaps



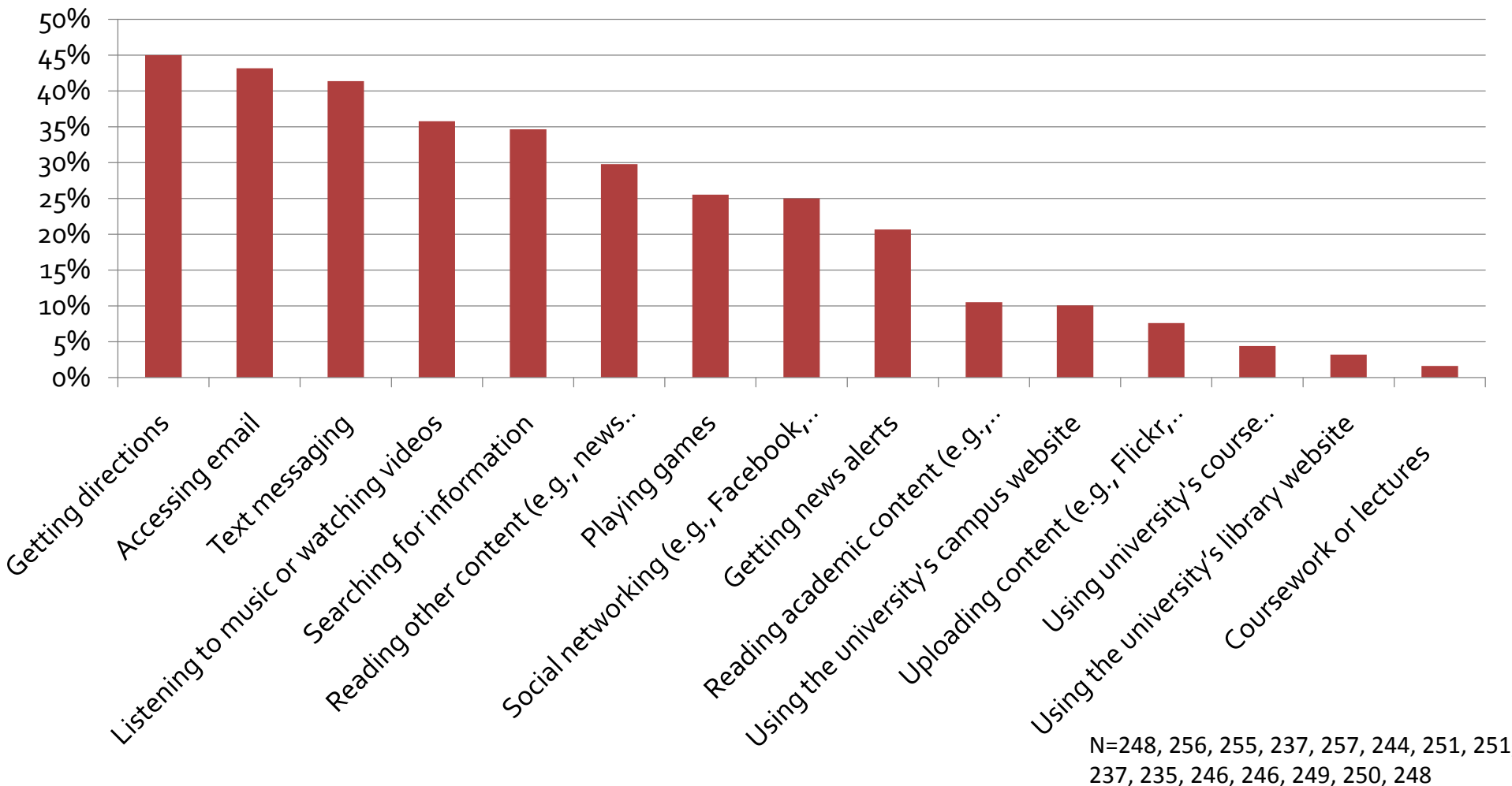
# Some Use Mobile Even When Computers Are Available

- 36% of survey respondents who own mobile devices with internet will occasionally use a mobile device even though a computer is available

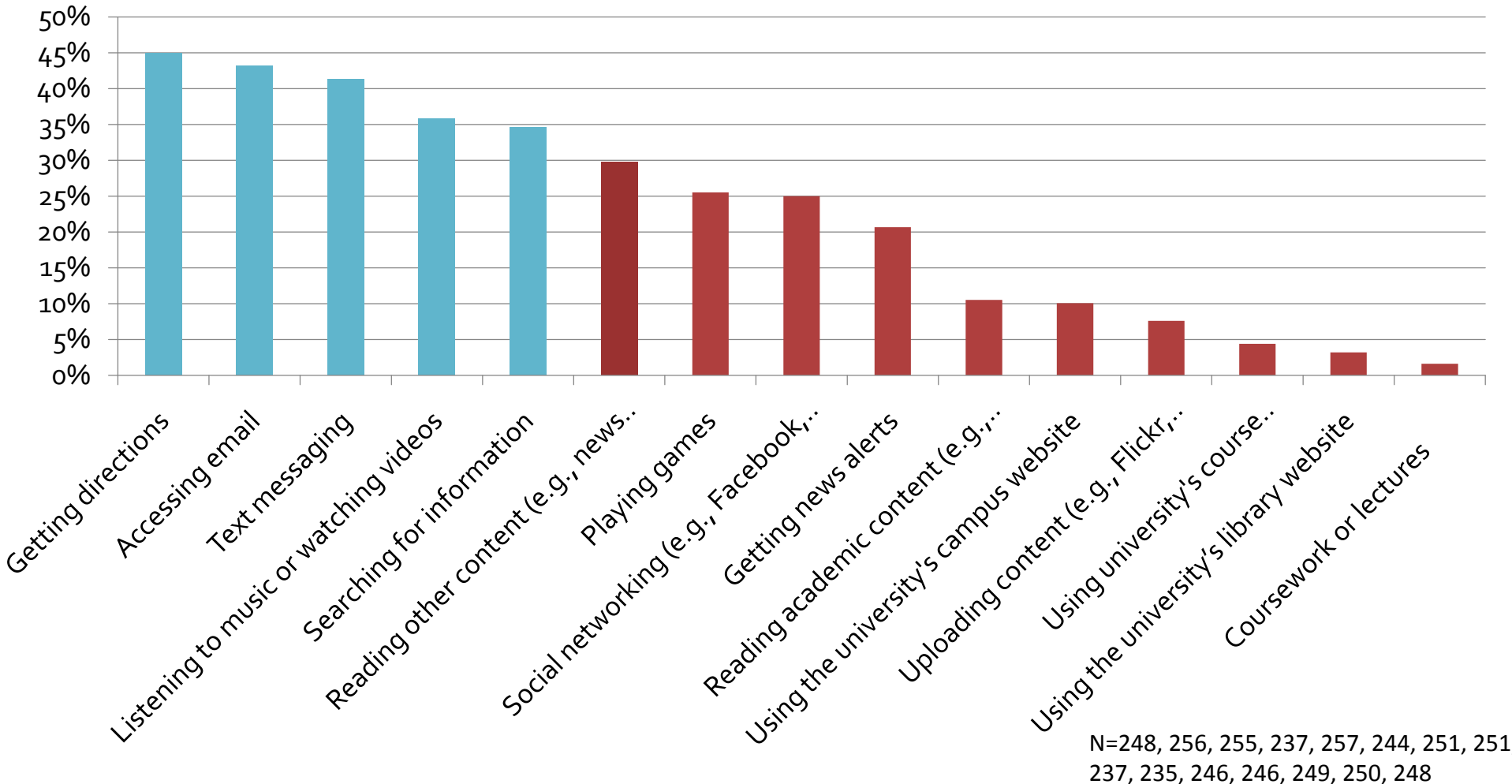
# Activities



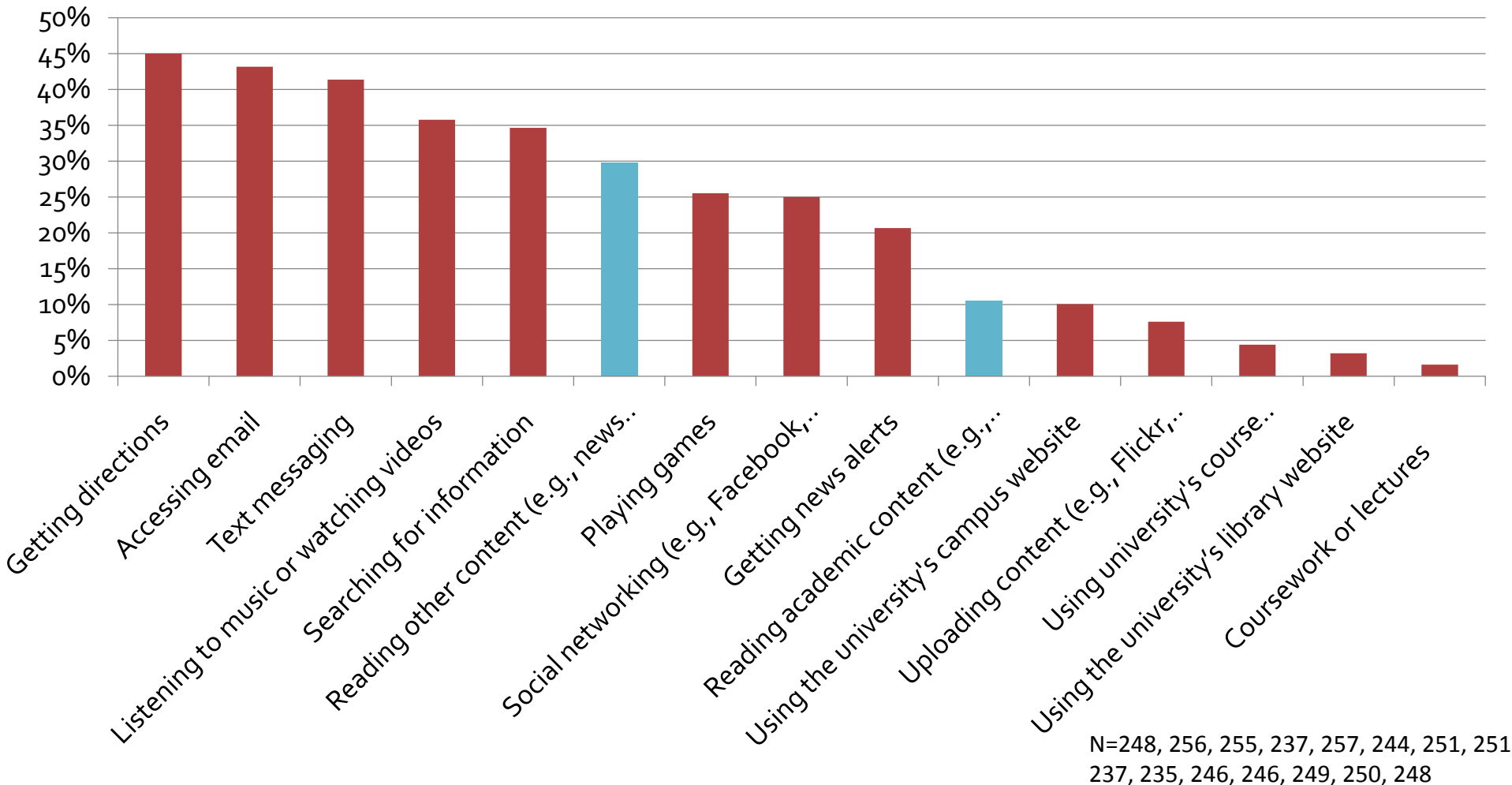
# Activities on Mobile Devices with Internet



- **Getting directions (45%)**
- **Accessing email (43%)**
- **Text messaging (41%)**
- **Listening to music or watching videos (36%)**
- **Searching for information (35%)**

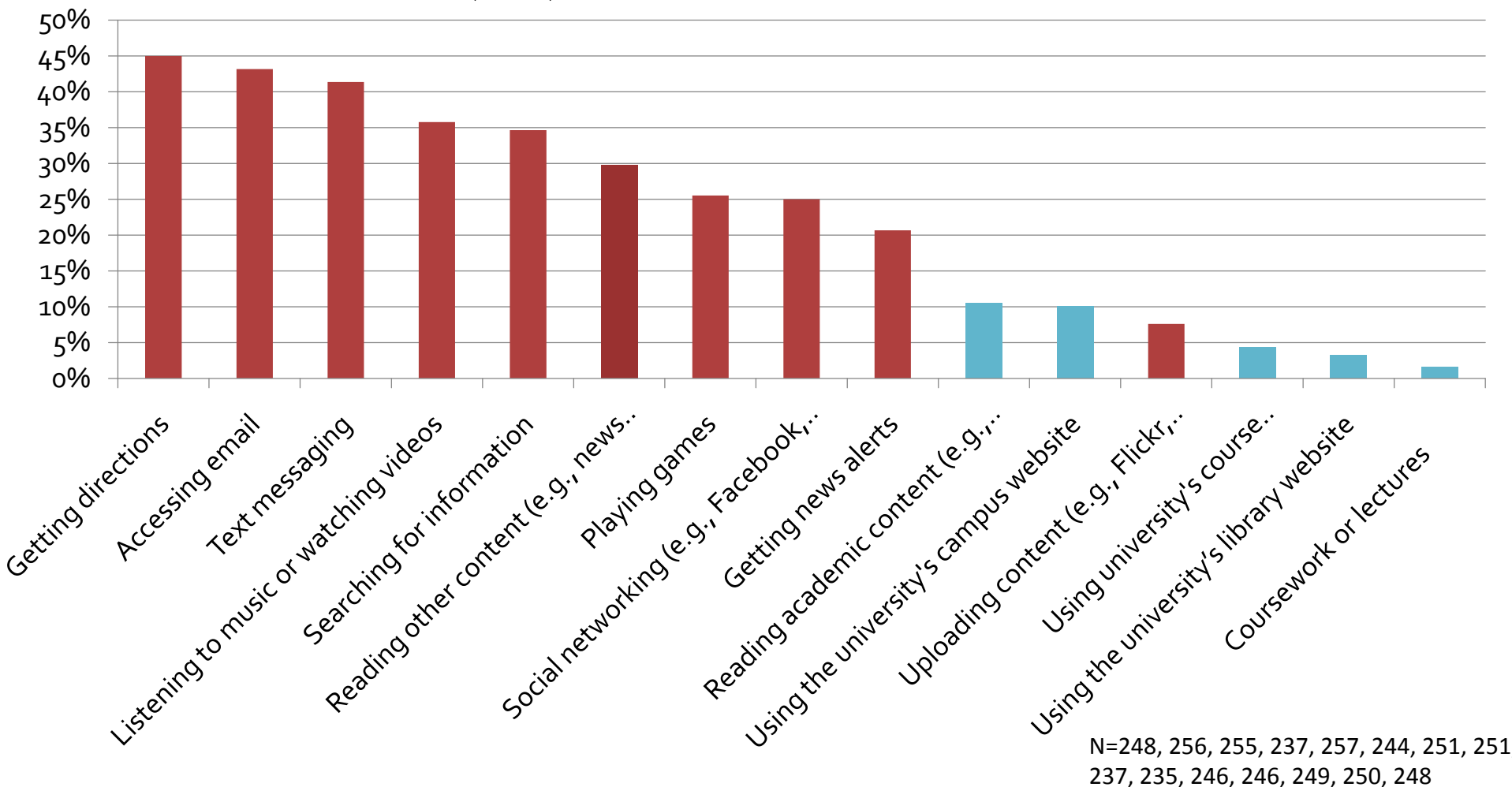


- Reading non-academic content (e.g. news articles, blogs) (30%)
- Reading academic content (11%)



# Anything academic-related ranks lower than personal use.

- Campus website (10%), course management (4%), library website (3%), coursework or lectures (2%)



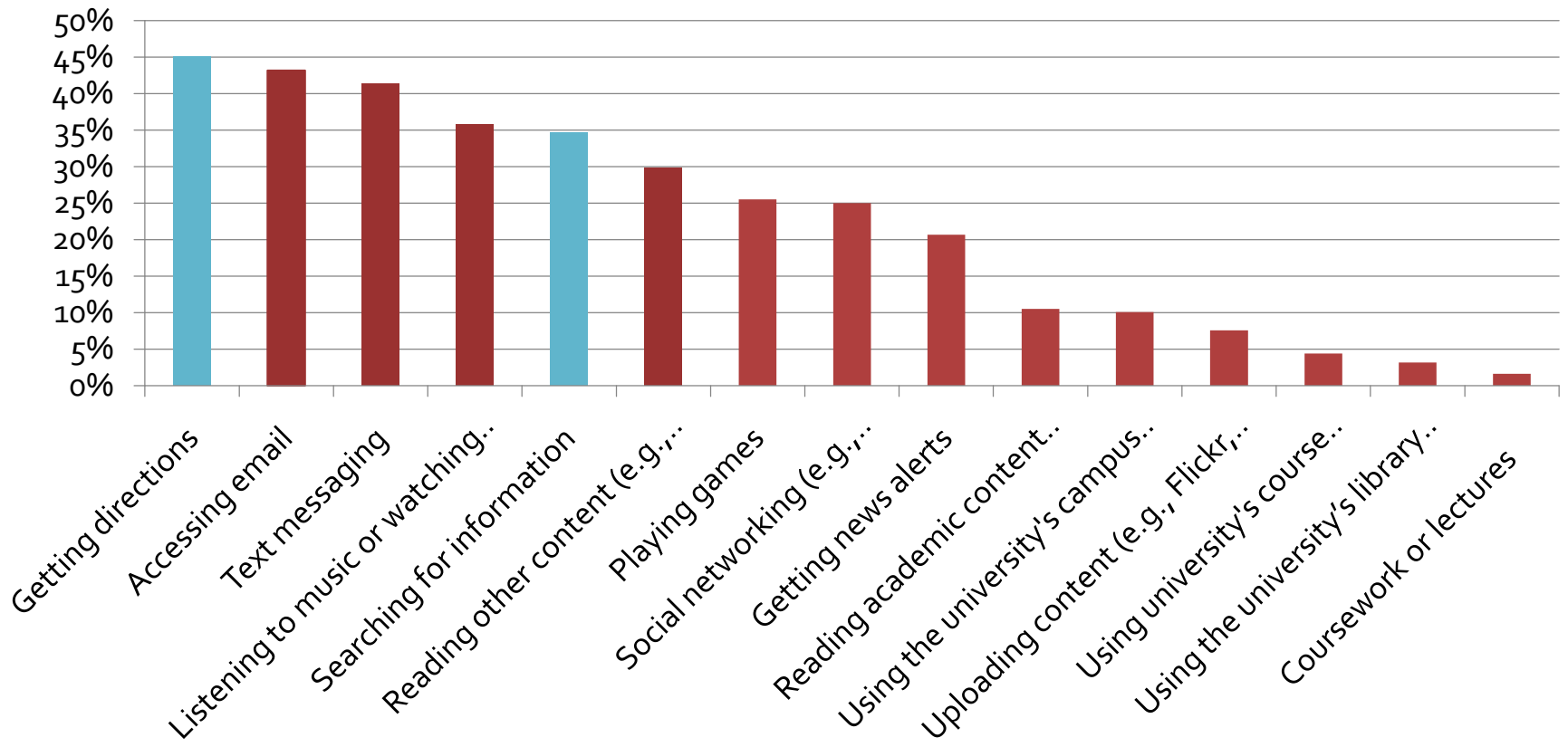


**In more detail...**





# Finding Information



N=248, 256, 255, 237, 257, 244, 251, 251,  
237, 235, 246, 246, 249, 250, 248



# Finding Information

- Mobile users seek quick hits of information, especially when there is a pressing need in the moment.
- Often mobile users seek information that is particularly relevant in a mobile context, such as directions or hours.

# Finding Information: SCUBA Diving vs. Snorkeling



# Finding Information: SCUBA Diving vs. Snorkeling

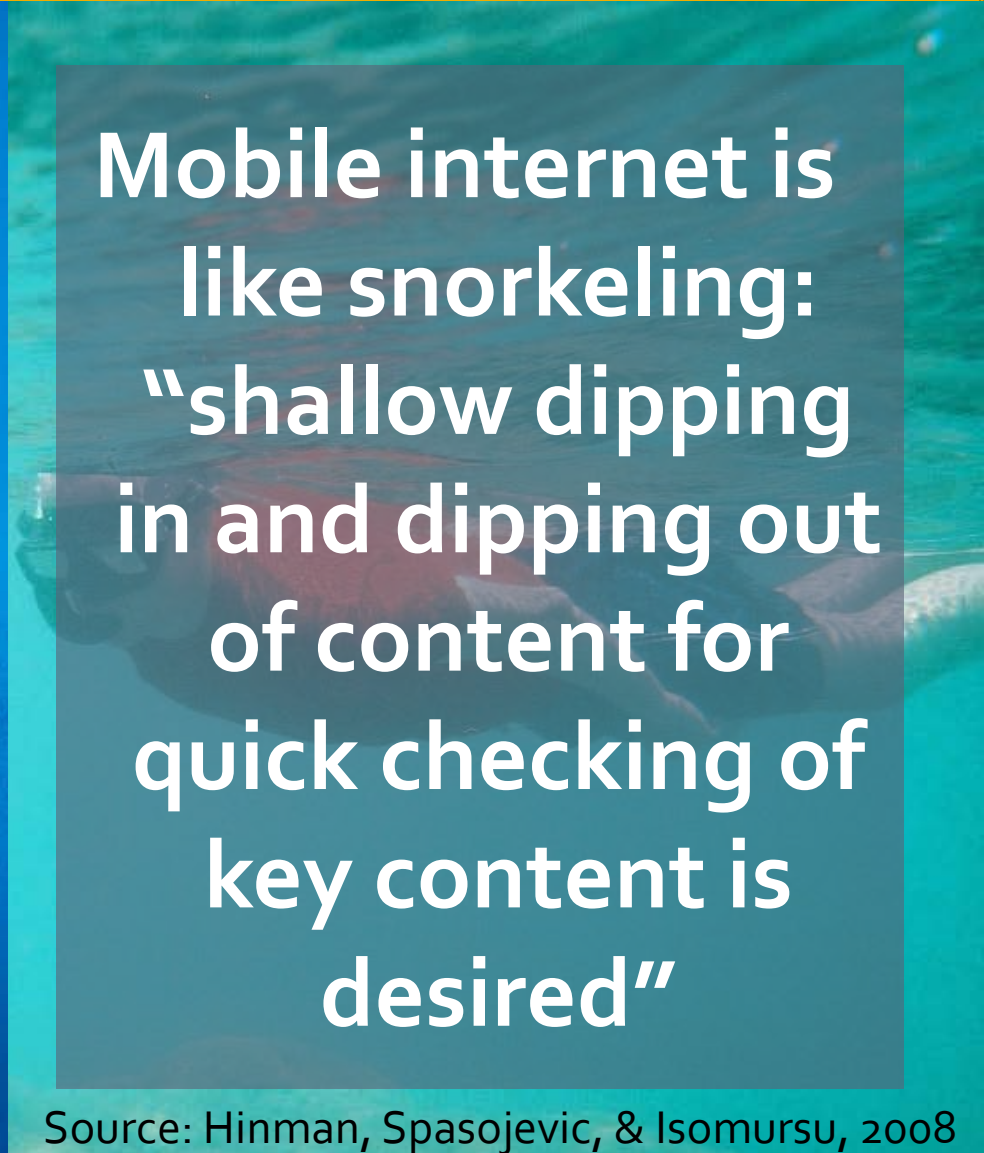
Desktop internet is like SCUBA diving: search can be “immersive” and “invites exploration and discovery”



Source: Hinman, Spasojevic, & Isomursu, 2008



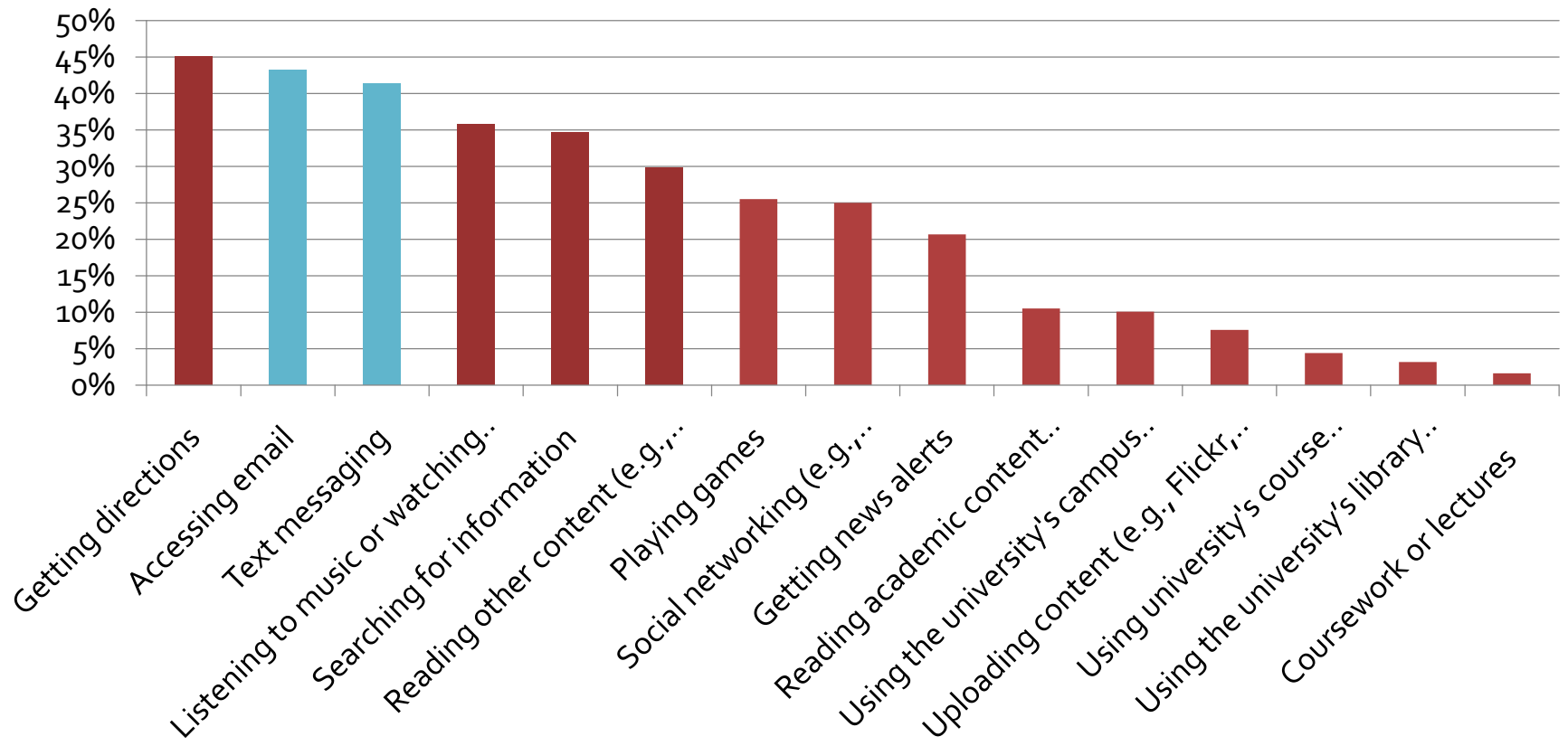
# Finding Information: SCUBA Diving vs. Snorkeling



Mobile internet is like snorkeling: “shallow dipping in and dipping out of content for quick checking of key content is desired”

Source: Hinman, Spasojevic, & Isomursu, 2008

# Email and Text Messages



N=248, 256, 255, 237, 257, 244, 251, 251,  
237, 235, 246, 246, 249, 250, 248

# Email

- 56% of survey respondents who have mobile devices with internet report that they access email from a mobile device several times a day

# Text Messages

- 89% of survey respondents report having text messaging on their phones

# Text Message Notification

- There is a lot of positive interest in library notifications by text message in the literature
- However, most interviewees prefer notifications by email instead of text message



# Text Message Notification

- Why?
  - Text messages demand immediate attention, and most didn't think library notifications were urgent
  - Email is easier to organize
  - Prefer to keep text messages as a channel for personal communication

# Email vs. Text Message

■ Faculty

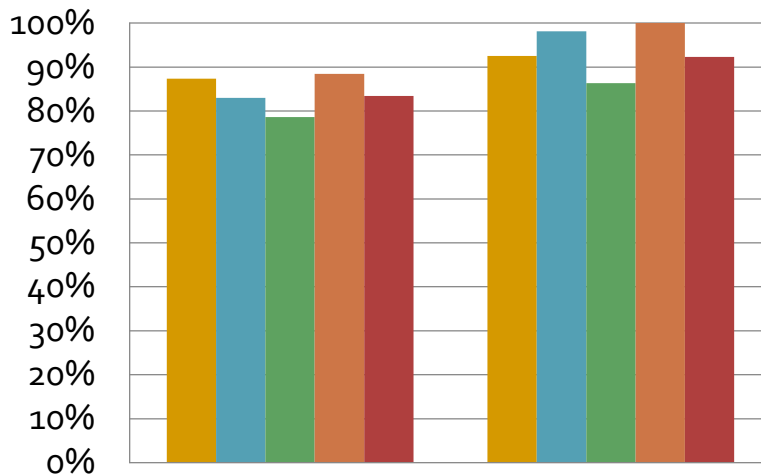
■ Graduate

■ Undergrad

■ Other

■ Total

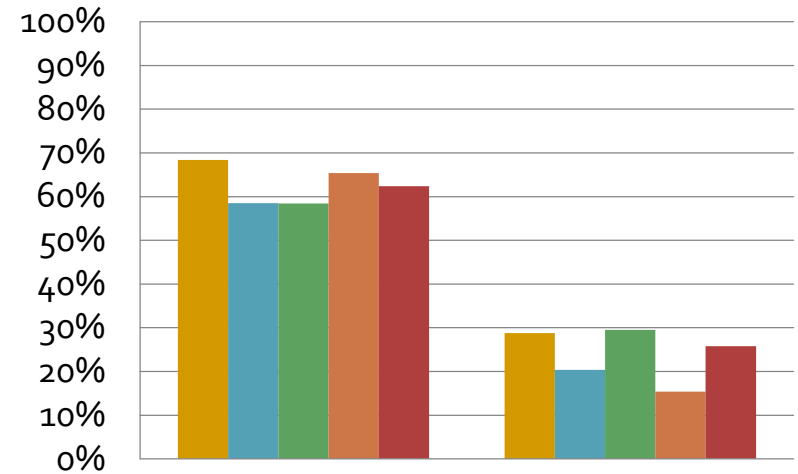
## Email



Communication with friends

Notifications (e.g., appointment reminder, library book due, flight status change)

## Text Message



Communication with friends

Notifications (e.g., appointment reminder, library book due, flight status change)

# Email vs. Text Message

- Some do prefer text message notification (25%), particularly those who do not use email on mobile devices

# Email for Organization

- Email is used to transfer information and files between devices

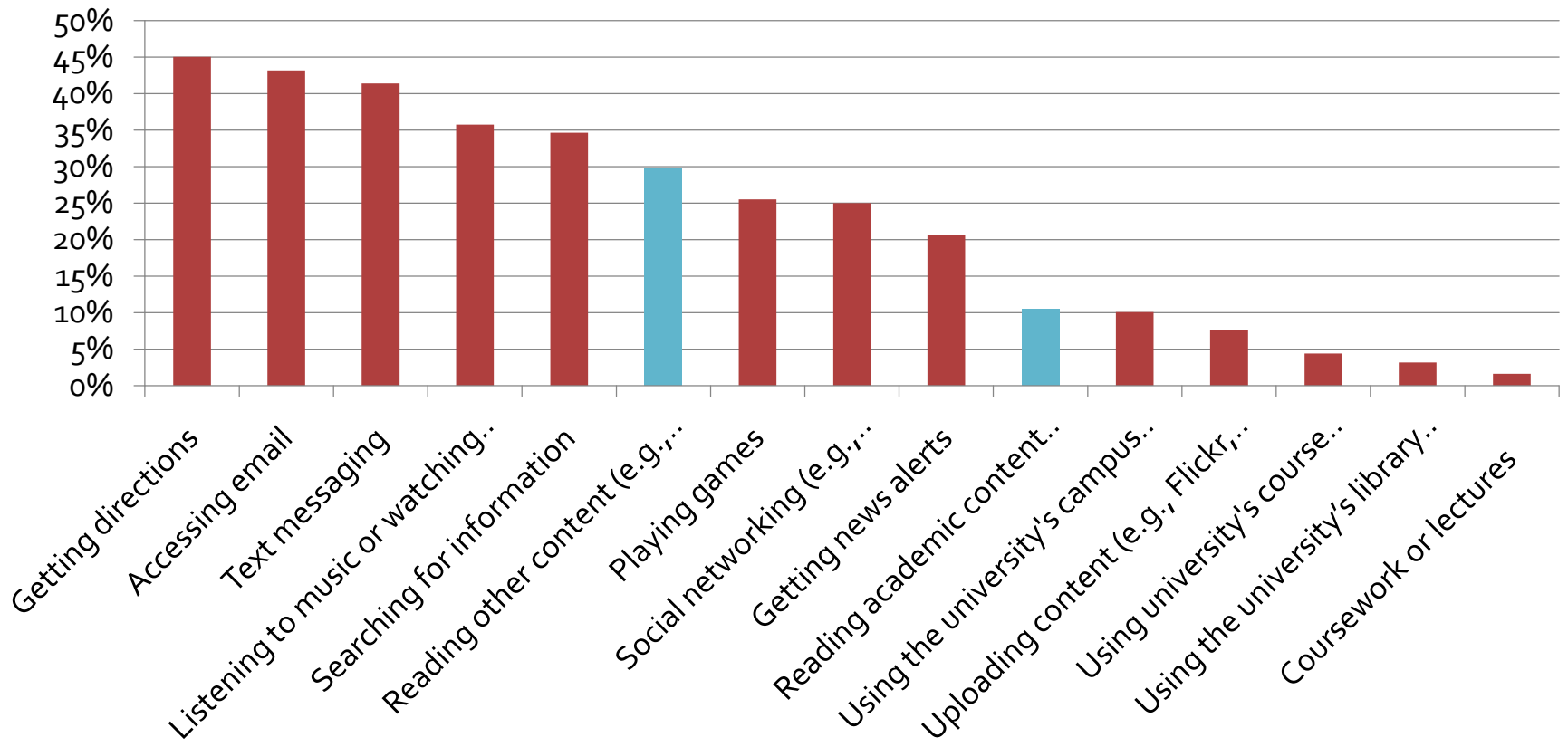
**“If it’s in an email,  
it's in my inbox, in  
my device. It’s  
automatically  
everywhere.”**

**— Archivist at  
UCSF**

# Taking Photographs

- Some use camera phones to send or record information
- One student takes pictures of his class schedule so that he can refer to it
- A special collections librarian takes pictures of call numbers to send to family members

# Reading Academic Content



N=248, 256, 255, 237, 257, 244, 251, 251,  
237, 235, 246, 246, 249, 250, 248

# Reading Academic Content

- Why is reading academic content so much lower than regular content?
  - Reading academic content is different than personal reading

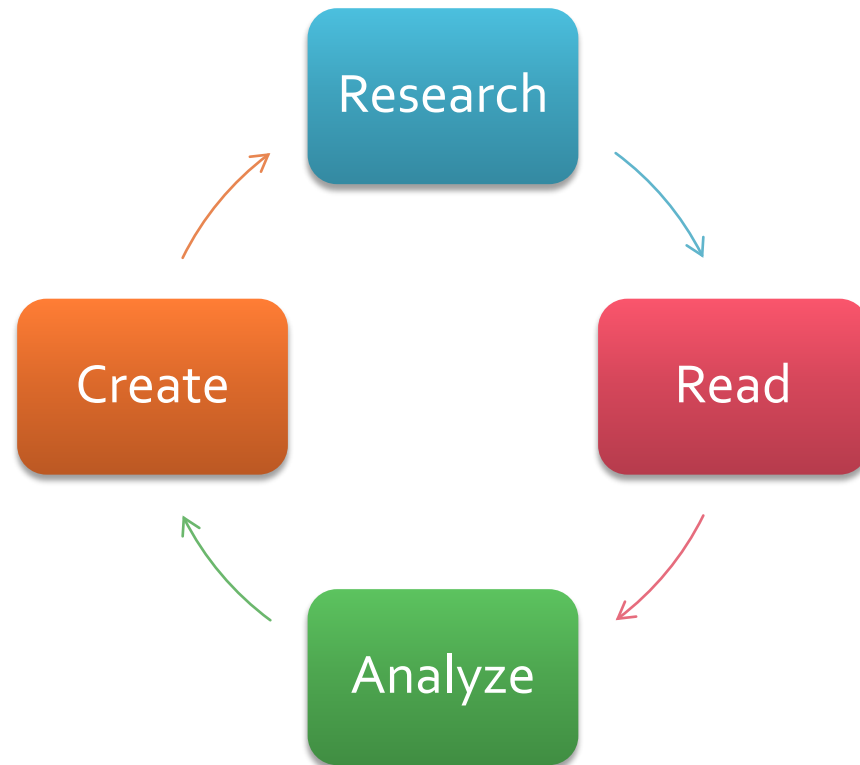


# Academic Cycle

- Reading academic content is part of a cycle of academic work

# Academic Cycle

- Reading academic content is part of a cycle of academic work



# Academic Cycle

- Different needs
  - Note taking
  - Comparing documents
  - Saving citations

# Academic Reading

- Most interviewees told us that they did not read academic content on their mobile devices

# Academic Reading

- Some prefer to read PDFs on their laptops and have complex organization systems for files and citations.
- Others prefer to read academic material on paper.

**“I tried, like when  
the professor sends  
PDFs, but I'm not  
great at reading it off  
of the screens”**

**— Student at UC  
Davis**



# Academic Reading

- Survey respondents reported **more** academic reading on their mobile devices than interviewees
- 26% of those who use internet on their mobile devices said that they read “academic content (e.g. books, articles)” on their devices at least **daily**

# eBook Readers and Tablets

- Only 5% of survey respondents reported reading academic content on eBook readers
- 7% report reading academic content on tablets
- Low ownership = Low use
  - About 50% of those who own either eBook readers or tablets use them for academic reading



# Research

- Research is also part of the academic cycle
- Most interviewees did not want to do actual academic research on mobile devices

**“It's a little  
complicated to do  
[library research] on  
the computer so I  
haven't tried on the  
iPod Touch”**

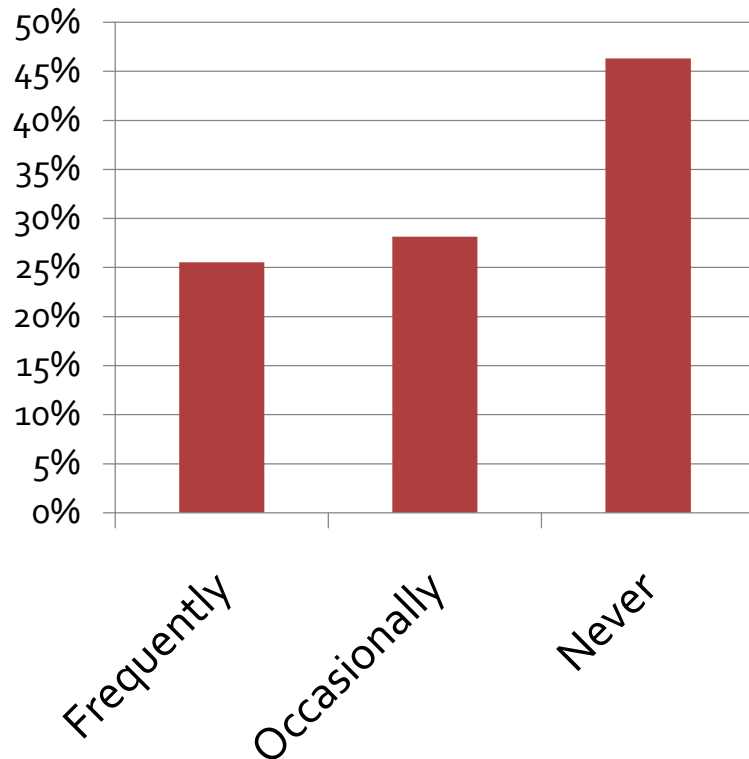
**— Student at UC  
Davis**

# Interest in Mobile Library Resources

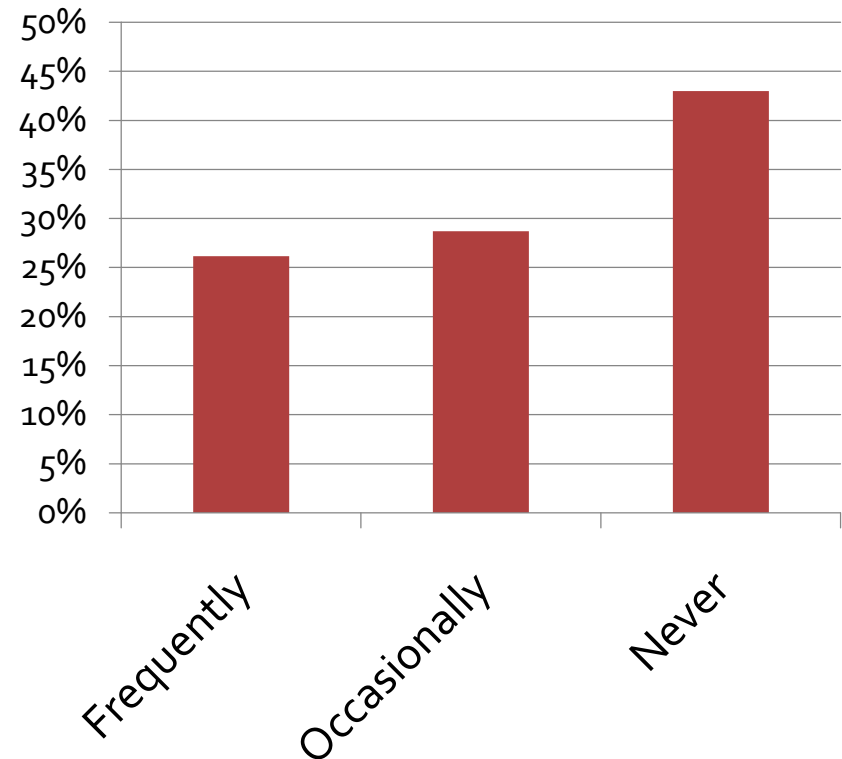
- However, there does seem to be an interest in having the option to access library databases, catalogs, and resources from mobile devices.

# Interest in Mobile Library Resources

## Search Library Databases on Mobile Device

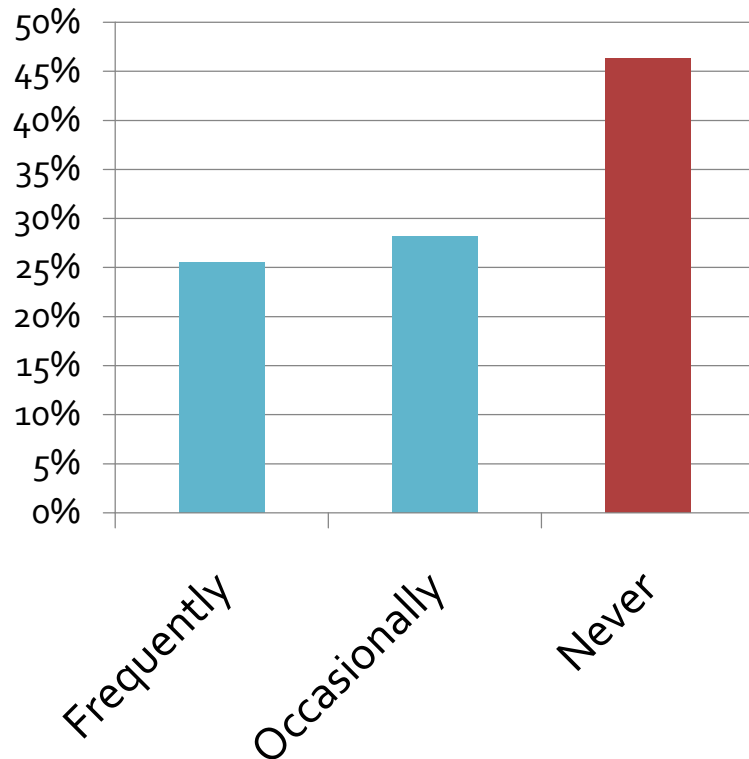


## Search Library Catalog on Mobile Device

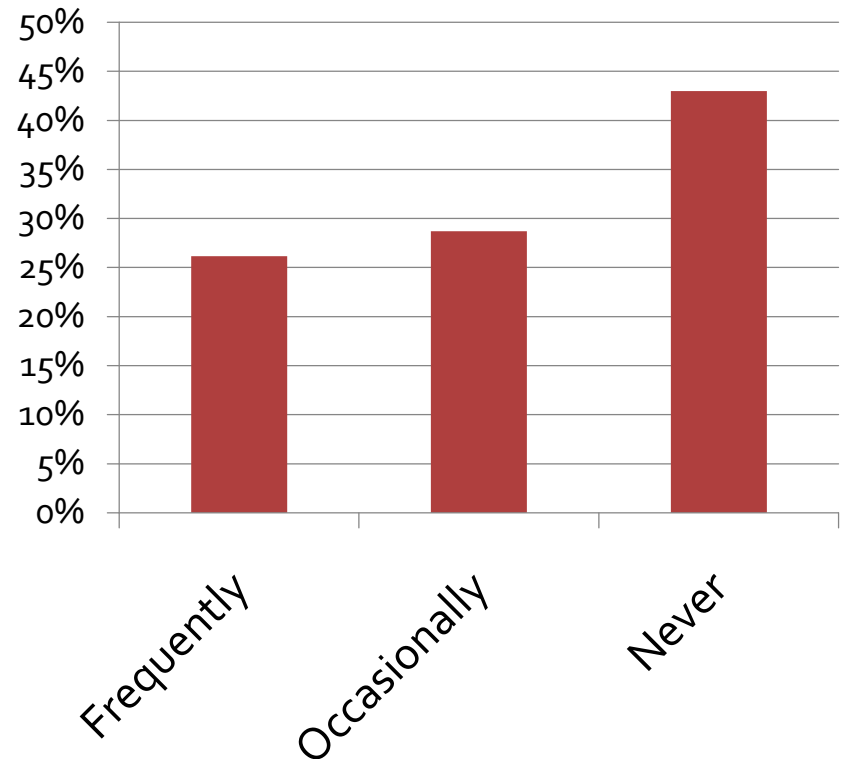


# Interest in Mobile Library Resources

## Search Library Databases on Mobile Device

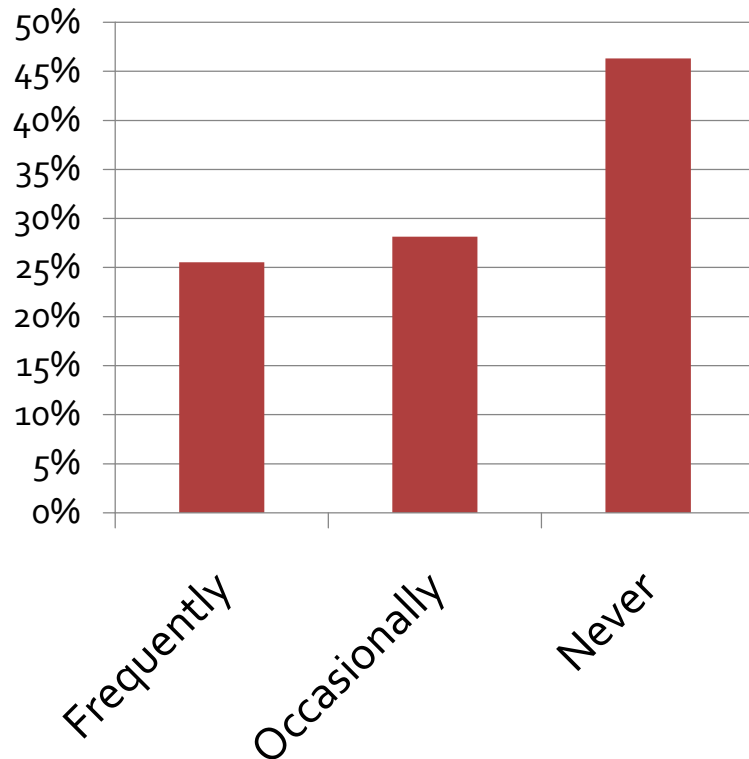


## Search Library Catalog on Mobile Device

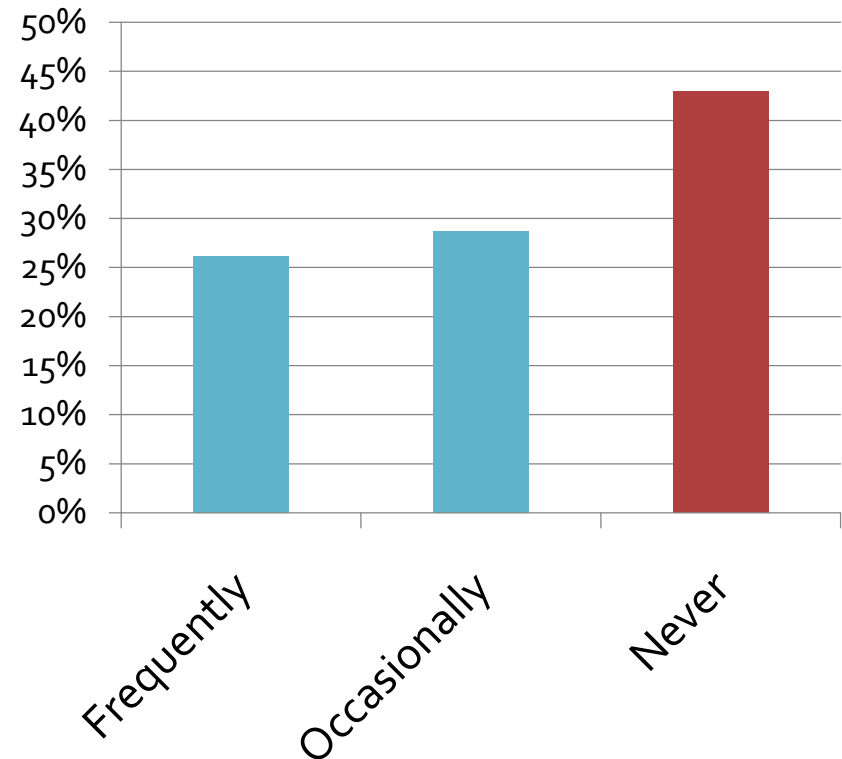


# Interest in Mobile Library Resources

## Search Library Databases on Mobile Device



## Search Library Catalog on Mobile Device



# Why?

- If they aren't researching, why do they want library resources on mobile devices?
  - Retrieve known material
  - Find quick information

**“I probably wouldn’t look for something new on [my mobile device] just because it’s kind of a pain. But if there was something that I knew was already there and was just looking for it, I might do that.”**

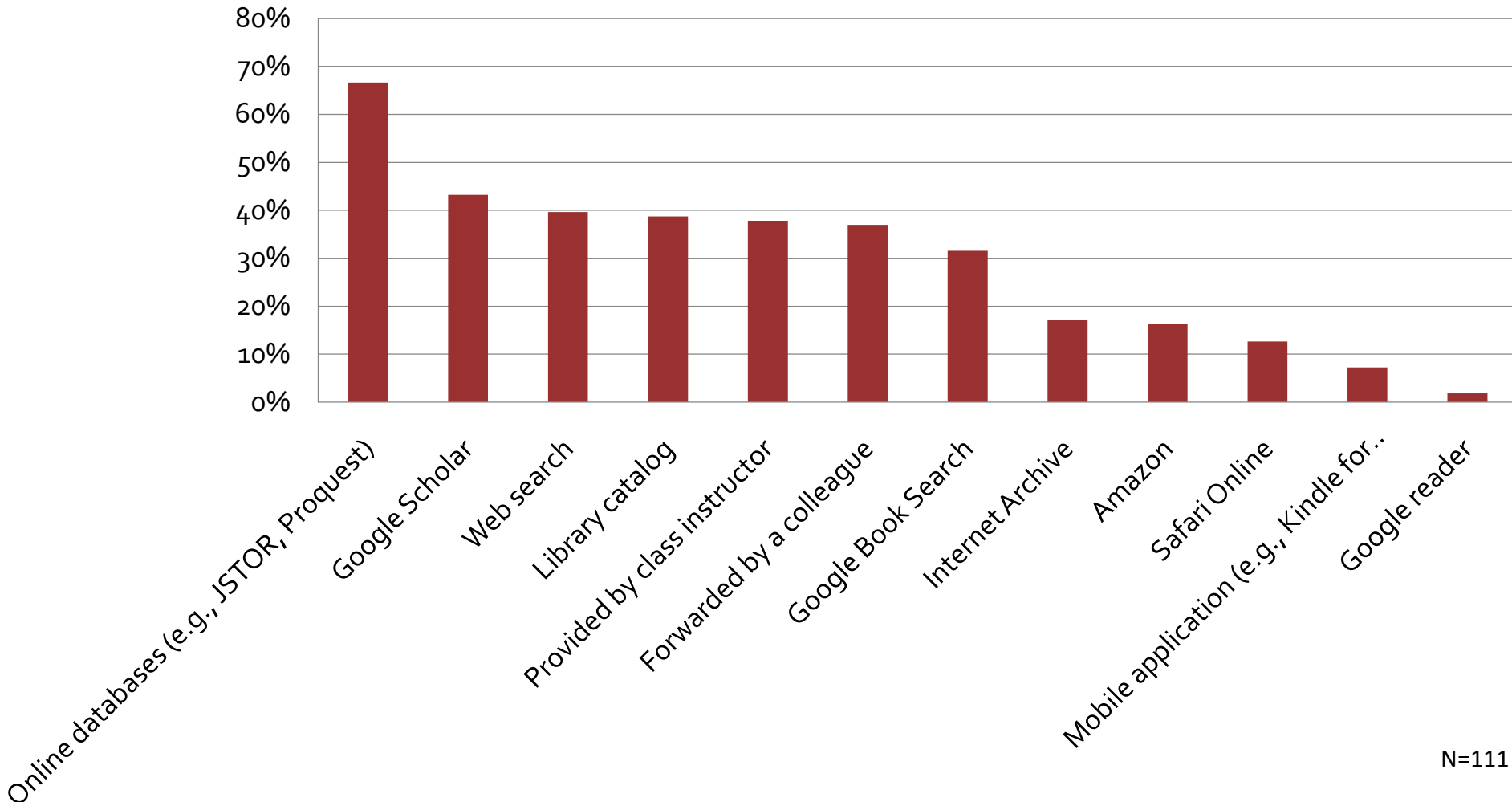
**— Student at UC Berkeley**



# Current Use

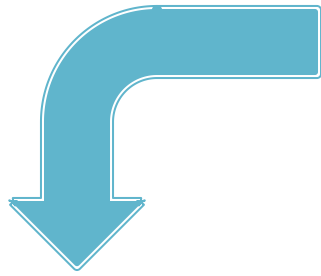
- Some survey respondents report that they find academic content on their mobile devices from library resources

# Finding Academic Material on Mobile Devices

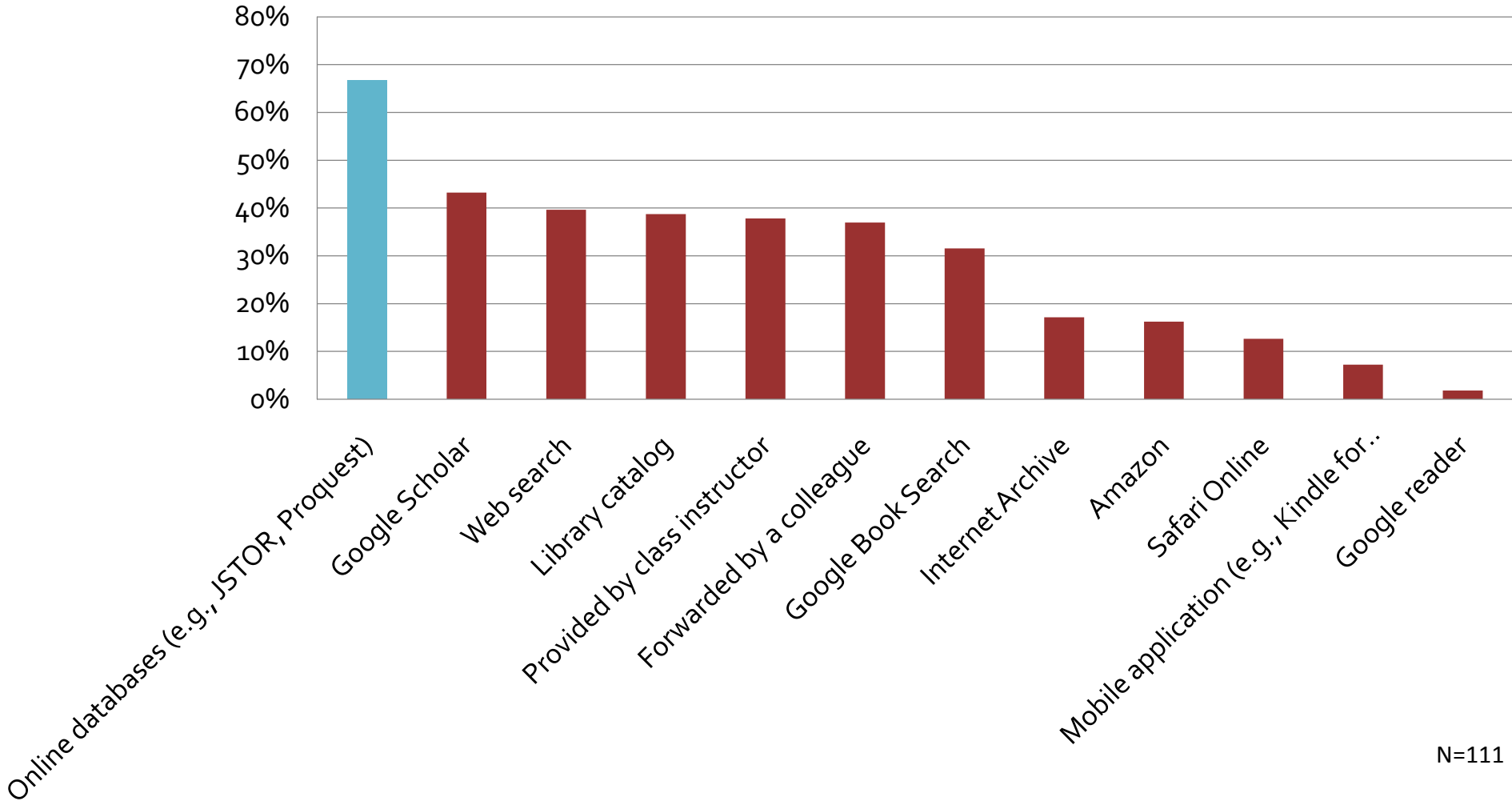


N=111

\*Out of survey respondents who report reading academic content on mobile devices



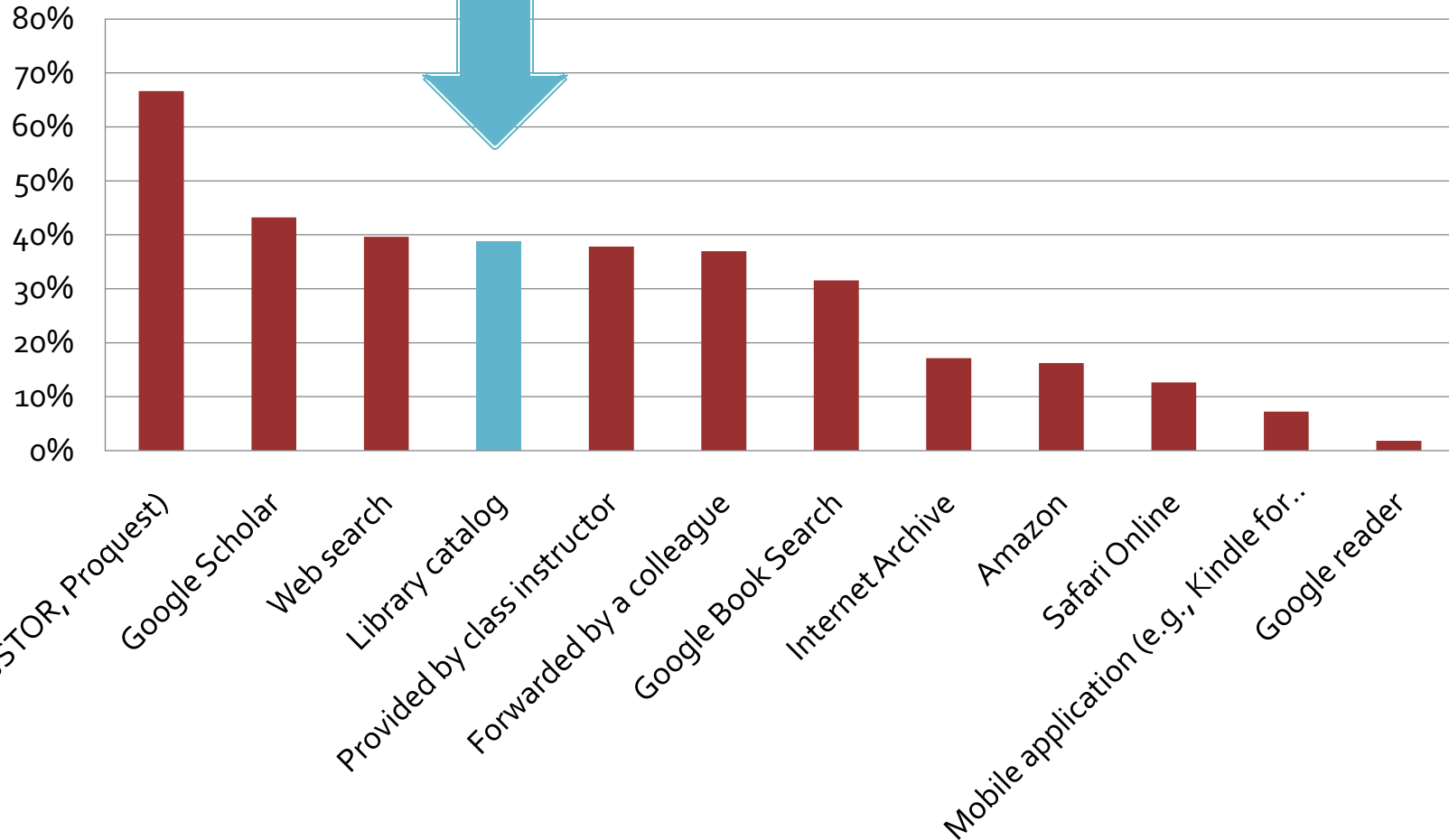
**67% use online  
databases (e.g.  
JSTOR, Proquest)**



N=111

\*Out of survey respondents who report reading academic content on mobile devices

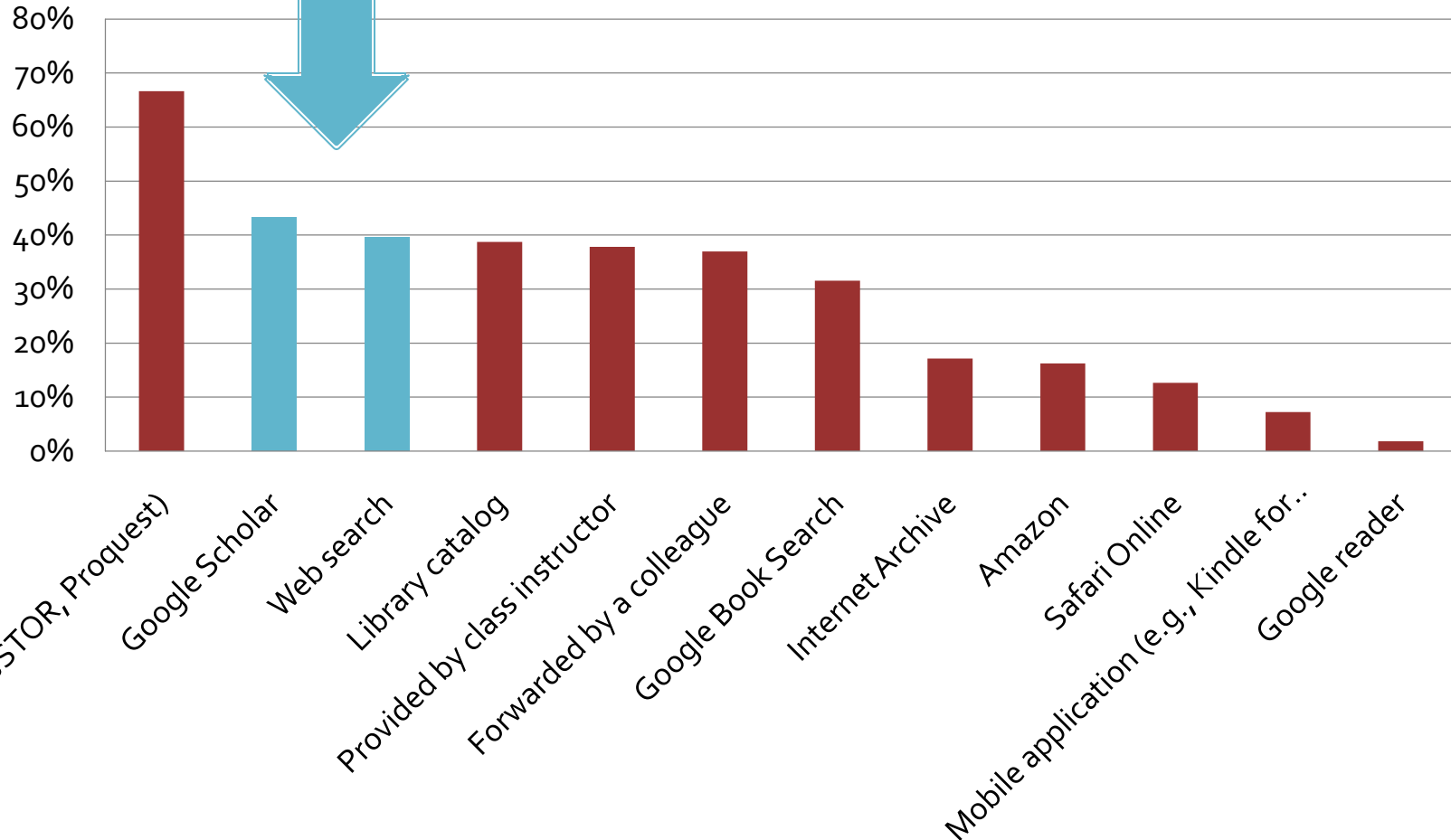
**39% use library catalog**



N=111

\*Out of survey respondents who report reading academic content on mobile devices

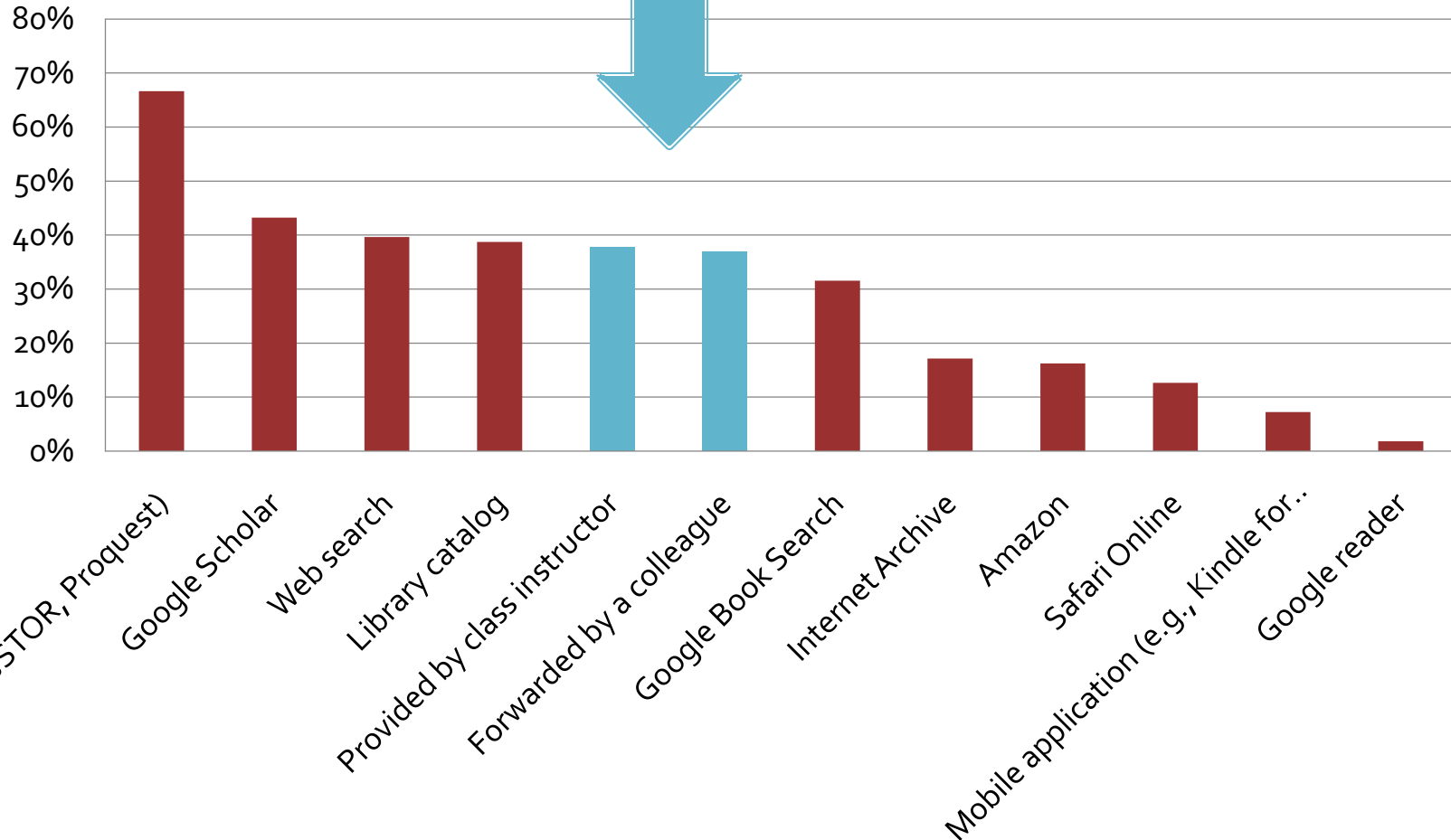
**43% use Google Scholar**  
**40% perform a web search**



N=111

\*Out of survey respondents who report reading academic content on mobile devices

**38% provided by  
class instructor**  
**37% forwarded by  
colleague**



N=111

\*Out of survey respondents who report reading academic content on mobile devices

# Barriers to Academic Content on Mobile Devices

- Transferring content
- File types

# Transferring Content

- Difficult to transfer content between devices, particularly when organization system is on laptop



**“I like to have my laptop with me because I have all of my stuff organized in a certain way there. And if there were a way that I could do it on my mobile device and then it would end up on my laptop eventually, I would do that. But that’s really my big issue...If it’s something that’s pertinent to my work, I’d want to be able to go and get it and then save it on my computer so that I can reference it later.”**

**— Staff clinician at UCSF**

# File Types

- Interviewees often expressed hesitation with reading on their mobile devices because of the difficulty of opening various file types.
  - Device's memory too small
  - Device doesn't read PDFs well
  - Have to download app to open attachments
  - Not sure if device can open PDFs

**“When I’m using PubMed I'm  
looking for a PDF of the  
article, and I don't think...can  
you open PDFs on [iPod  
Touch]? I don't know  
actually.”**

**— Student at UCSF**

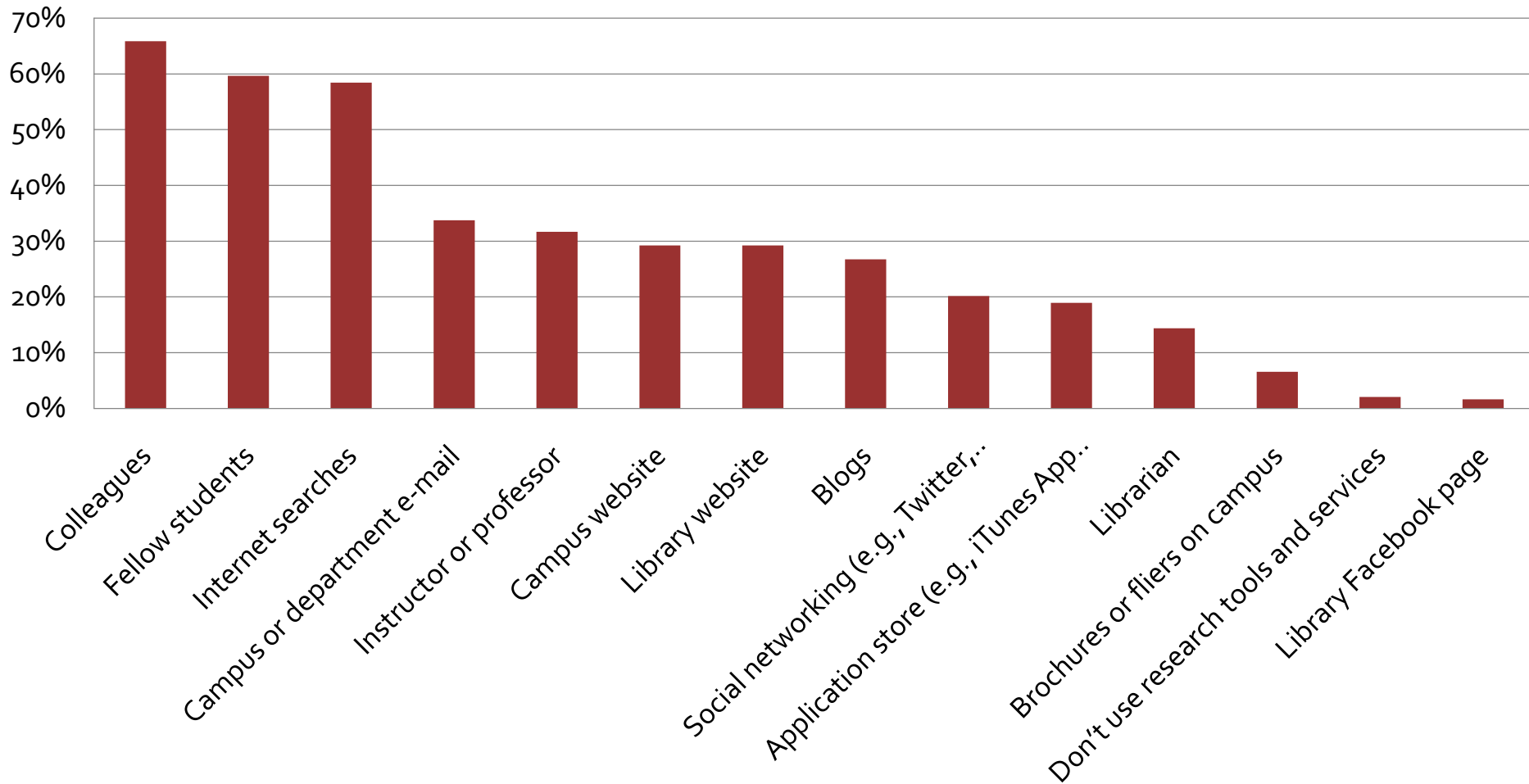
# Reading PDFs

- PDFs are clearly the medium of choice for survey respondents for reading academic content on a mobile device
- Out of survey respondents who reported using a mobile device for academic reading, 74% reported reading from downloaded PDFs

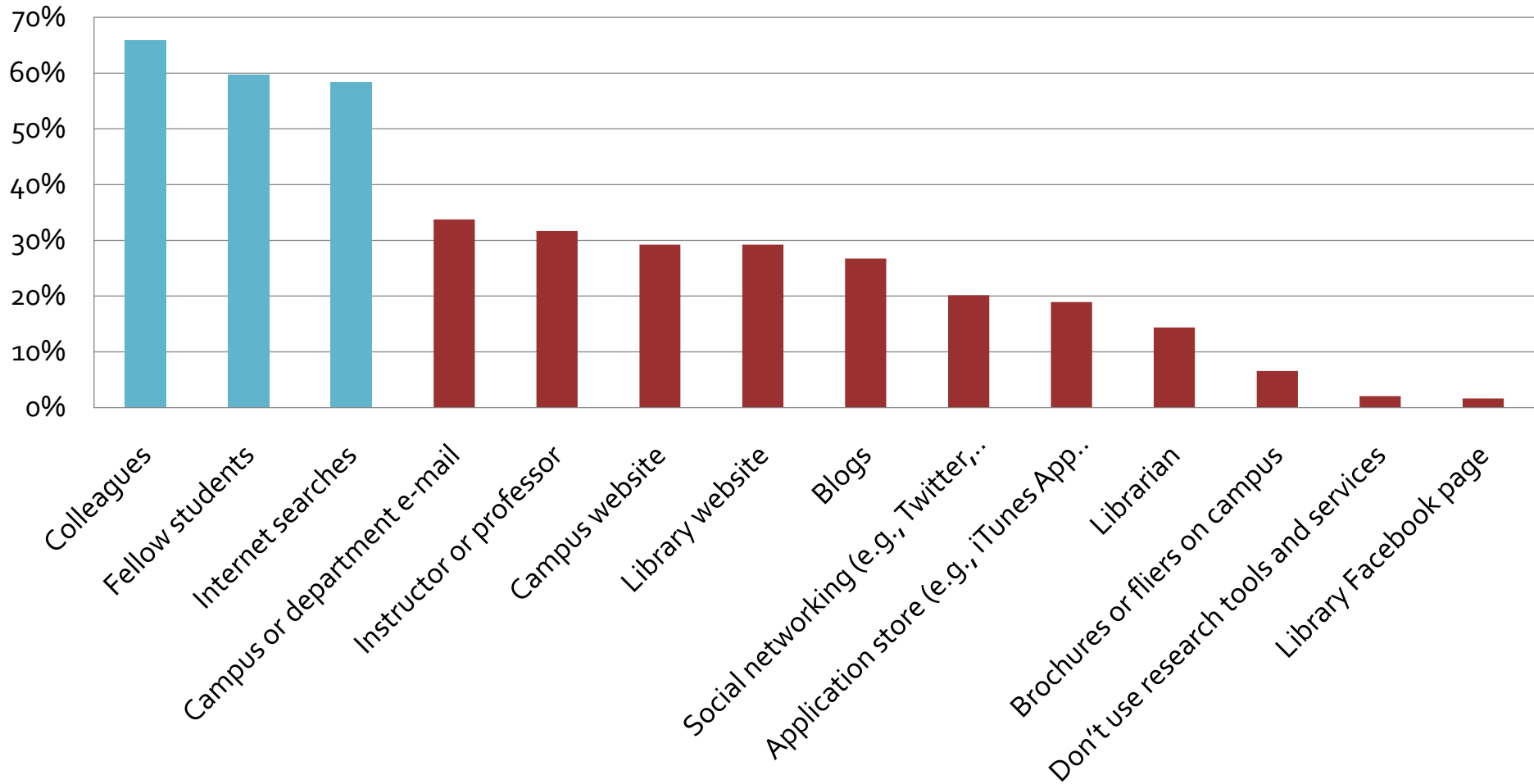
# Reaching Your Mobile Audience



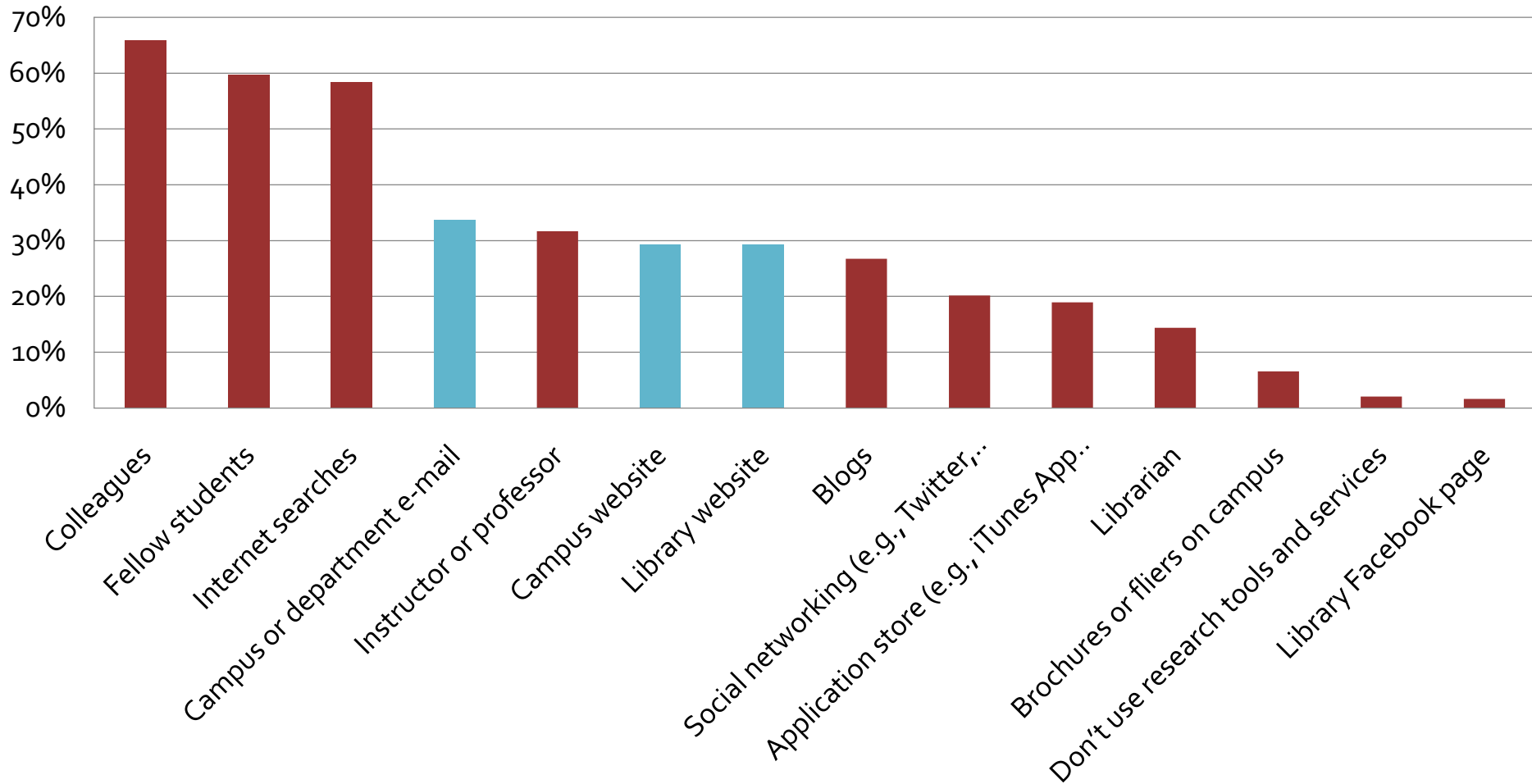
# How People Find New Tools and Services



- **Colleagues (66%)**
- **Fellow students (60%)**
- **Internet searches (58%)**

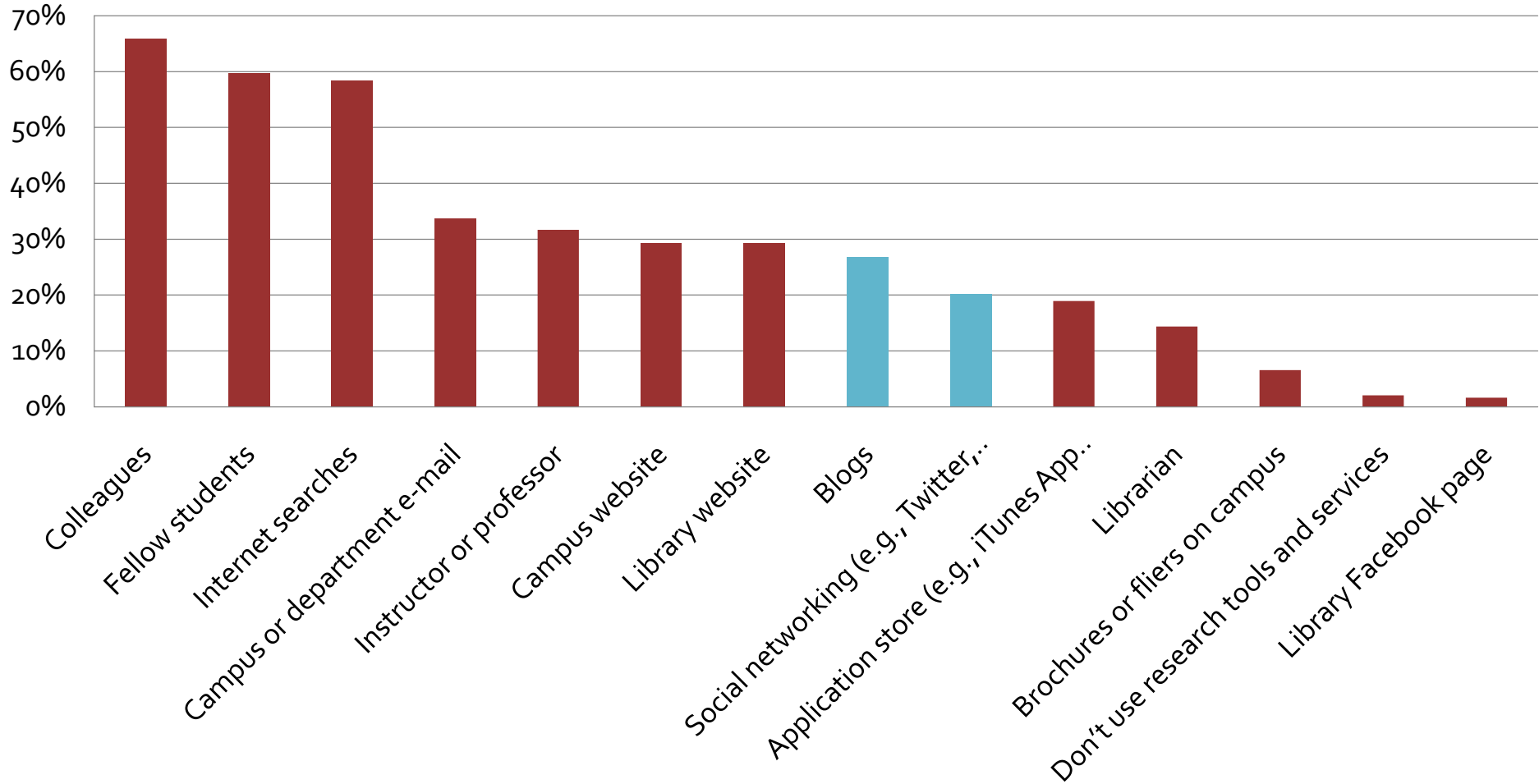


- **Campus or department email (34%)**
- **Campus website (29%)**
- **Library website (29%)**

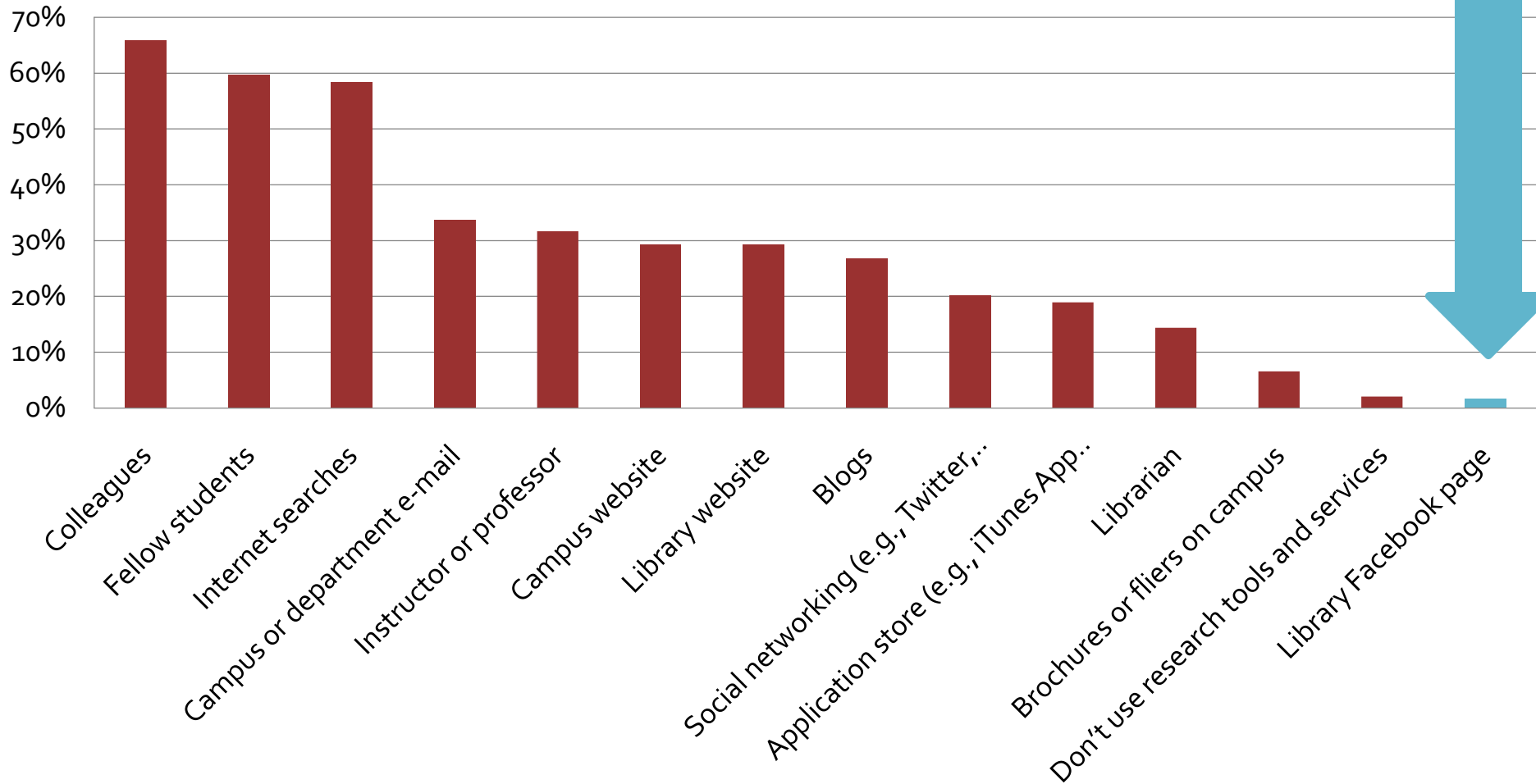
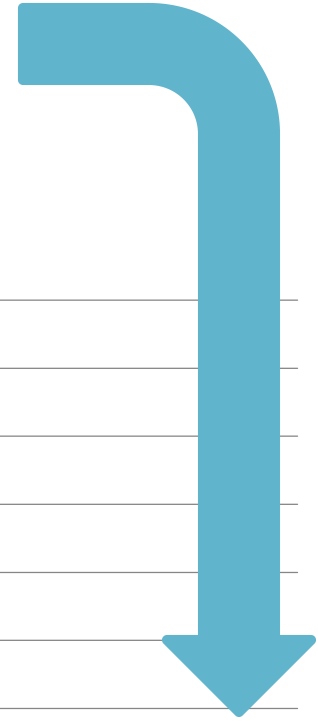




- **Blogs (27%)**
- **Social networking tools (20%)**



**The library's Facebook page is only 2%, so it should not be the only channel for advertising new tools**



# Recommendations



# Prepare

- Set up testing practices and environments for current services
- Test your current web presence on the top mobile platforms
- Consider multiple access points for content

# Track

- Adopt and maintain accurate mobile device tracking and usage statistics
- Continue to survey users annually or bi-annually

# Develop

- Develop specific mobile recommendations for the needs of certain audiences
  - Discovery and Delivery (separate report)
  - Digital Special Collections (separate report)
  - Cdlib.org prototype in progress

# Best Practices for Mobile Design

- Simplify
  - Prioritize information that users would need in a mobile context
  - Do not build apps or mobile websites that have complicated interactions or features
  - Do not try to replicate full website functionality

# Best Practices for Mobile Design

- For academic tools, look for ways to support the academic cycle
  - Make it easy to transfer between devices, particularly using email
- Focus on accessing content rather than generating or uploading it



# Best Practices for Mobile Design

- Prioritize mobile websites over apps in general
- Auto-detect mobile devices, but always provide a link to the full site
- Advertise through a variety of channels, including campus or department emails, campus websites, library websites, and blogs

# References and Resources

## Sources:

- Entner, R. (2010, March 26). Smartphones to Overtake Feature Phones in U.S. by 2011 | Nielsen Wire. Nielsen Wire. Retrieved June 9, 2010, from <http://blog.nielsen.com/nielsenwire/consumer/smartphones-to-overtake-feature-phones-in-u-s-by-2011/>
- Hinman, R., Spasojevic, M., & Isomursu, P. (2008). They call it surfing for a reason: identifying mobile internet needs through pc internet deprivation. In CHI '08 extended abstracts on Human factors in computing systems (pp. 2195-2208). Florence, Italy: ACM. doi:10.1145/1358628.1358652

## Mentioned sources:

- Nielsen Wire. (2010b, August 2). Android Soars, but iPhone Still Most Desired as Smartphones Grab 25% of U.S. Mobile Market. Retrieved August 9, 2010, from [http://blog.nielsen.com/nielsenwire/online\\_mobile/android-soars-but-iphone-still-most-desired-as-smartphones-grab-25-of-u-s-mobile-market/](http://blog.nielsen.com/nielsenwire/online_mobile/android-soars-but-iphone-still-most-desired-as-smartphones-grab-25-of-u-s-mobile-market/)
- Smith, S., Salaway, G., & Caruso, J. (2009). The ECAR Study of Undergraduate Students and Information Technology, 2009 (No. ERS0906). EDUCAUSE Center for Applied Research. Retrieved from <http://www.educause.edu/Resources/TheECARStudyofUndergraduateStu/187215>

## Images:

- Balloon book: <http://www.flickr.com/photos/invertebra/398712498/>
- IDEO cards: <http://www.flickr.com/photos/mdxinteractiondesign/2318390956/>
- Magnifying glass: <http://www.flickr.com/photos/gregpc/2203498581/>
- Group looking at iPhones: <http://www.flickr.com/photos/shapeshift/2384168299/>
- Man using phone and laptop: <http://www.flickr.com/photos/clintjcl/2699754684/>
- Maypole: <http://www.flickr.com/photos/peteashton/175700682/>
- Details: <http://www.flickr.com/photos/boskizzi/5817433/>
- Scuba: <http://www.flickr.com/photos/timparkinson/82115969/>
- Snorkeling: <http://www.flickr.com/photos/mysticgringo/215942227/>
- Book and phone: <http://www.flickr.com/photos/angelocesare/82488258/>
- Woman with blue background: <http://www.flickr.com/photos/dailytravelphotos/4439867210/>
- Tin can: <http://www.flickr.com/photos/94379417@N00/4808475862/>



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