



Personal Devices in the Workplace

NC Digital Government Summit
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Mobile is Pervasive

BUSINESSES MAKING SENSE OF MOBILE

Companies large and small are also developing their own mobile apps to target new customers or engage existing ones.

**iPHONE IS BEING DEPLOYED
OR TESTED BY**



**iPAD IS BEING DEPLOYED
OR USED AT**





Mobile Expense Management



By 2015 there will be almost
15 BILLION
NETWORK-CONNECTED DEVICES
according to Cisco Systems
That means more than 2 per every person on the planet



75% OF COMPANIES SAID THEY WERE NOT MANAGING THEIR MOBILE EXPENSES EFFECTIVELY



SMARTPHONES, TABLETS, E-READERS



SALES OF WEB-ENABLED MOBILE DEVICES HAVE SURPASSED SALES OF WEB-ENABLED LAPTOPS, NOTEBOOKS, AND DESKTOP COMPUTERS.

BY 2016, IT'S PROJECTED THAT CUMULATIVE MOBILE APPS DOWNLOADS WILL REACH 44 BILLION.

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DAILY NEWS UPDATE:

MOBILE APPS DOWNLOADS REACH

44 BILLION



\$6.8 BILLION

2010



2015

THE WORLDWIDE ONLINE APP MARKET IS EXPECTED TO GROW FROM ABOUT \$6.8 BILLION IN 2010 TO \$25 BILLION BY 2015.

SOURCES

BUSINESSWEEK, FORRESTER, ABI RESEARCH, READ WRITE WEB, FROST & SULLIVAN, GIGAOM PRO



How we use our smartphones

ACTIVITY BY AVERAGE TIME PER DAY



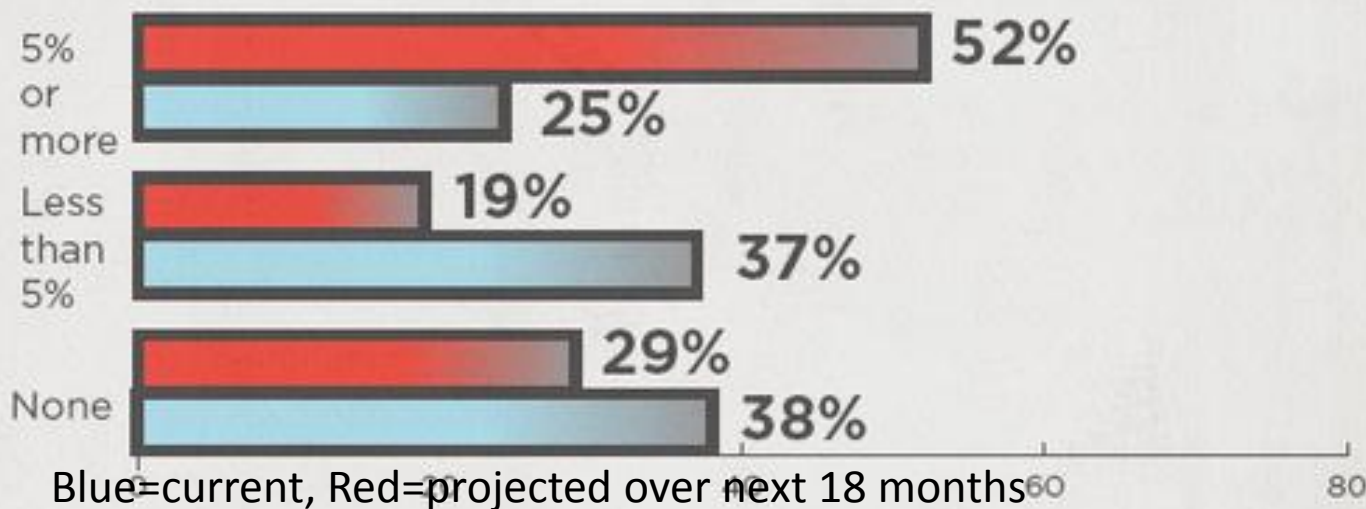
Source: O2



Huge Tablet Growth Expected

GREATER RELIANCE ON TABLETS IN THE NEXT YEAR AND A HALF

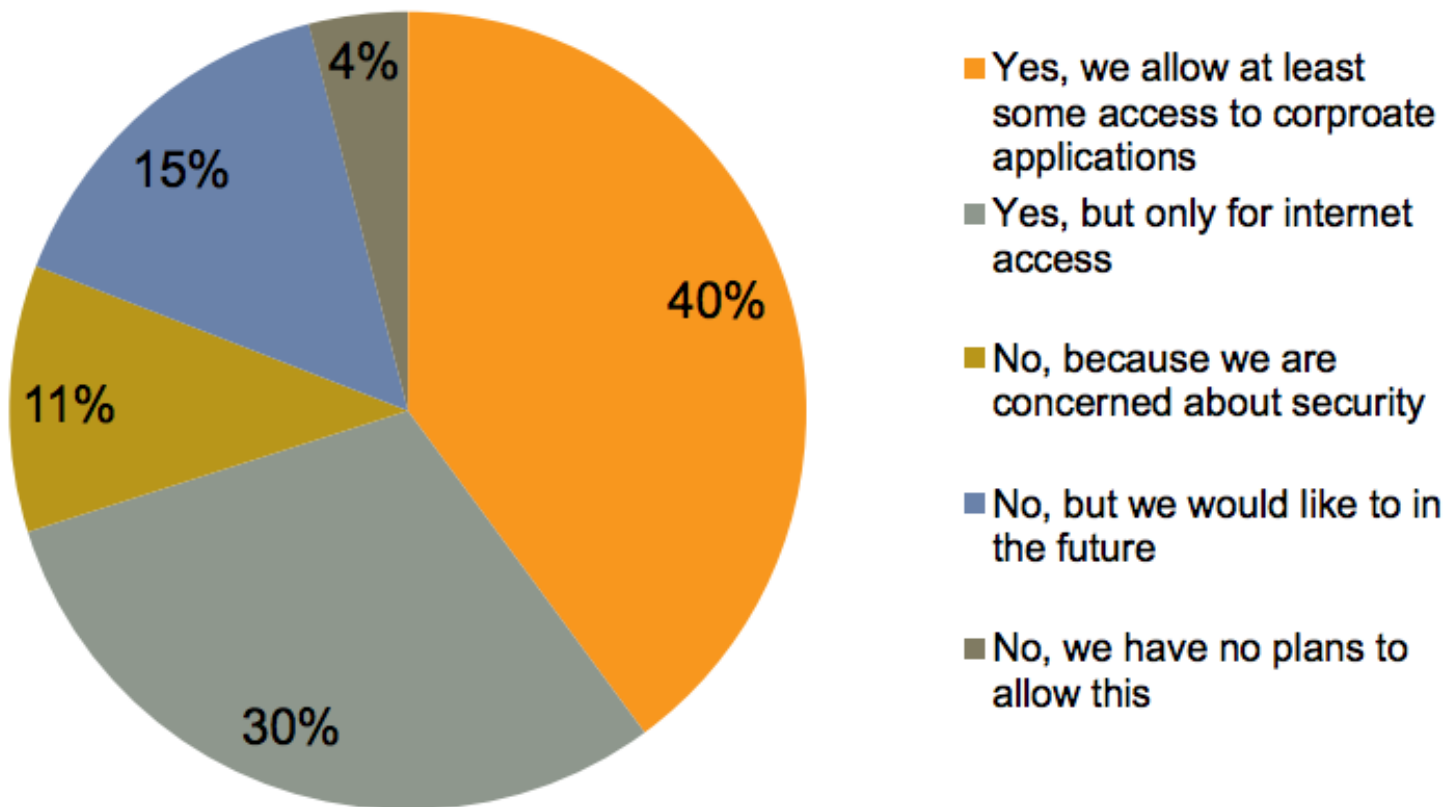
While tablet use is currently low, over half believe that at least 5% will primarily use tablets in the next 12-18 months.





Worldwide Phenomena

Do you allow employees to bring their own devices to work?



Europe, Middle East & Africa

<http://www.zdnet.com/blog/btl/byod-inches-along-in-europe-middle-east-africa/77605>



Satisfaction is the Key

Bring Your Own Device (BYOD) is gaining popularity as more and more businesses are allowing their employees to connect their personal devices to their business network.

BYOD PLEASES BUT GETS COMPLICATED FAST WITH THE PLETHORA OF DEVICES AVAILABLE

- 50%** of I.T. Managers believe BYOD increases productivity
- 66%** of employees want to use any device
- 61%** of companies that allow BYOD have higher employee satisfaction
- 40%** of college students would accept a lower paying job to use a device of their choice
- 45%** of employees would accept a lower paying job to use a device of their choice



75% OF COMPANIES ALLOW BYOD



Aberdeen found that companies
50% ALLOW ANY DEVICE
25% SPECIFY DEVICES
25% DON'T ALLOW BYOD

Aberdeen found that the cost to a company from a carrier such as:



is on average



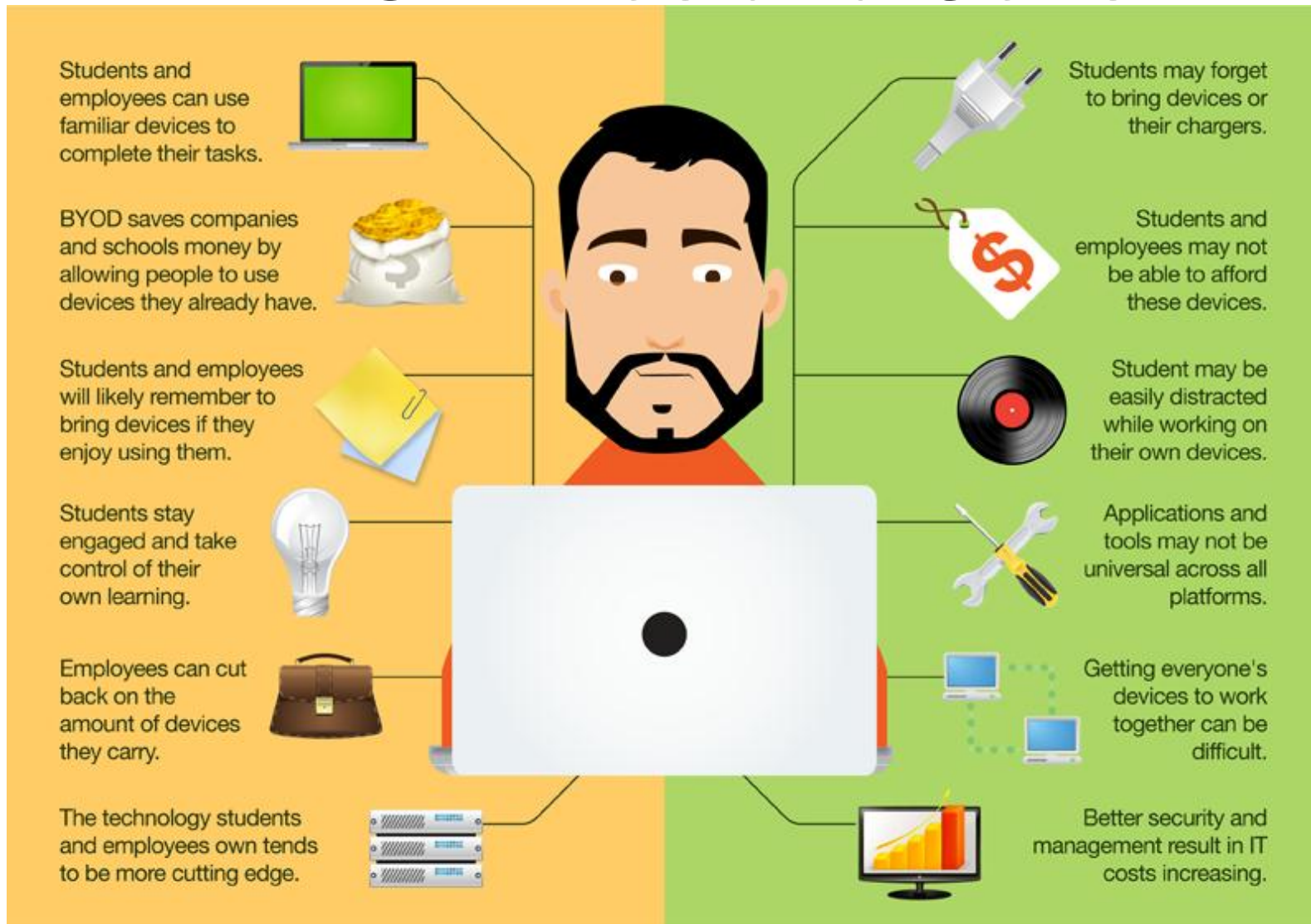
COMPANY OWNED DEVICE



BYOD



BYOD Pros and Cons





Top Barriers to BYOD

LET THEM EAT CAKE
employees expect mobility

BYOD - BRING YOUR OWN DEVICE



66%

of employees want IT to let them use any device they choose

45%

of IT workers aren't prepared to support a borderless mobile workforce

61% of Companies that let employees use personal mobile device have higher employee satisfaction.

TOP 3 BARRIERS TO BYOD



SECURITY

57%



BUDGET

34%

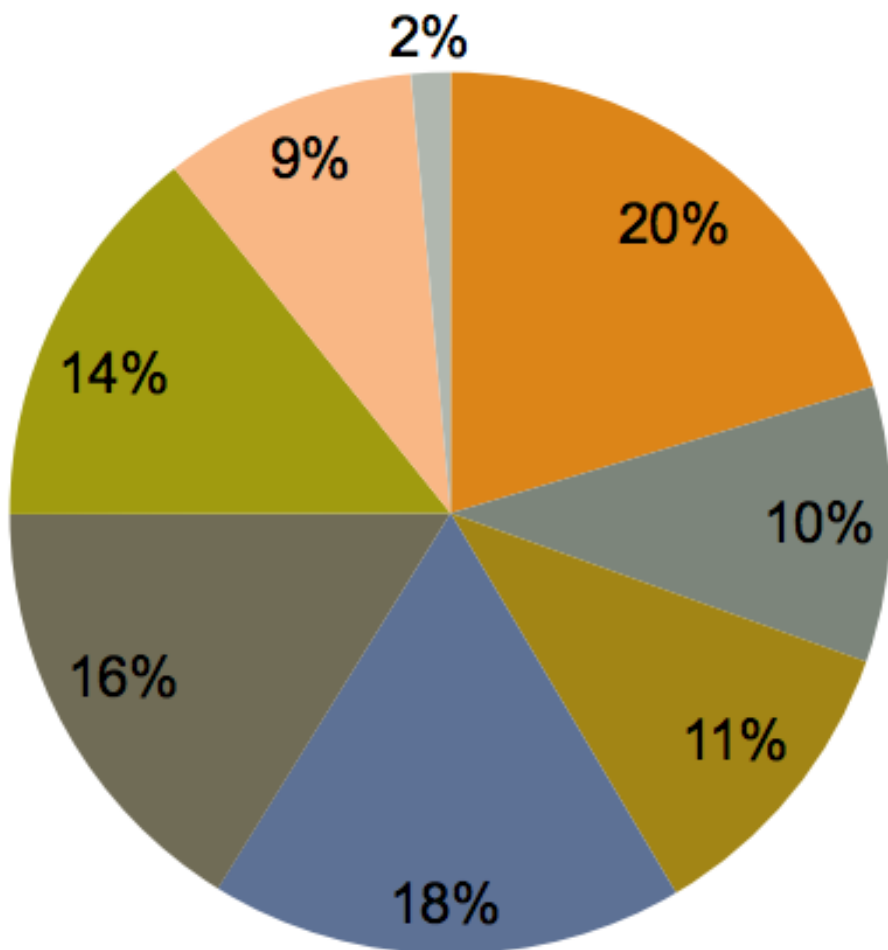


STAFF EXPERTISE

17%



What are the main challenges you face with respect to BYOD?



- Securely connecting employee devices
- Avoiding the use of more IT resources
- Building enough wireless coverage and capacity
- Ensuring mobile device security
- Establishing a corporate policy on acceptable use
- Enforcing access rights based on user, device and application
- Evaluating the business benefit, relative to risk
- Other

Europe, Middle East & Africa

<http://www.zdnet.com/blog/btl/byod-inches-along-in-europe-middle-east-africa/77605>



2012 Horizon Report – Technologies to Watch

- Within next 12 months:
 - Mobile Apps
 - Tablet Computing
- Within 2~3 years:
 - Game based learning
 - Learning analytics
- Within 4~5 years:
 - Gesture based computing
 - The Internet of Things

Historical View: Enterprise Client Evolution

Today

Yesterday

Unmanaged Fixed Client

- Security Challenges
 - Unmanaged
- Inefficient operations
 - Client-server

Device Managed Fixed & Mobile Client

- Focus on TCO efficiency
 - "One size fits all"
 - Monolithic image locked to device
- Mainstream mobility
- Internet Computing

Evolving

Centrally Managed Virtual Client

- CHV (DVC) & SHV (VDI)
 - Drive to centralized administration
 - Virtual workspaces
 - 1:many user/device
- Compute, collaborate & communicate
- Wireless broadband

Emerging

Cloud Managed Client-aware

- Cloud Computing
- On demand computing
 - Elastic, ubiquitous
 - Virtual computing
- Device independent mobility (device aware)
 - N-screens
 - 3D Internet

Device Centric

User Centric





BYOD

Brandyn Federlick
LaserFiche



Personal IT Devices on a University Campus

Marc Hoit, PhD

Vice Chancellor for IT

NC State University



NC State is a Small City

- 34,000 Student, 8,000 Faculty & Staff
 - 11 Colleges – each with departments
 - 57 centers & institutes
- \$1.2 B annual expenditure budget
- Business focus: Education (training) & Research
 - Research: \$361M annual expenditures
- 2,120 acres in size
 - 348 Buildings > 1000 sq ft
 - 14.2 million gross square feet
 - 1.2 million rentable square feet on Centennial Campus
 - 18.7 miles of paved roads
 - 72 residence halls housing 8,454



Smartphones are Everywhere

A majority of students and adults own the devices necessary for BYOD.

Of adults (18+) surveyed in 2011, percentage ownership of different BYOD devices are:



Smartphones

Laptop Computers

Desktop Computers

Tablet / eReader

iPod / MP3



(from 2012)



Costs BYOD Users Pay Out of Pocket

Percent of BYOD employees who pay





Growth in acceptance of BYOD

A 2011 Study Revealed:



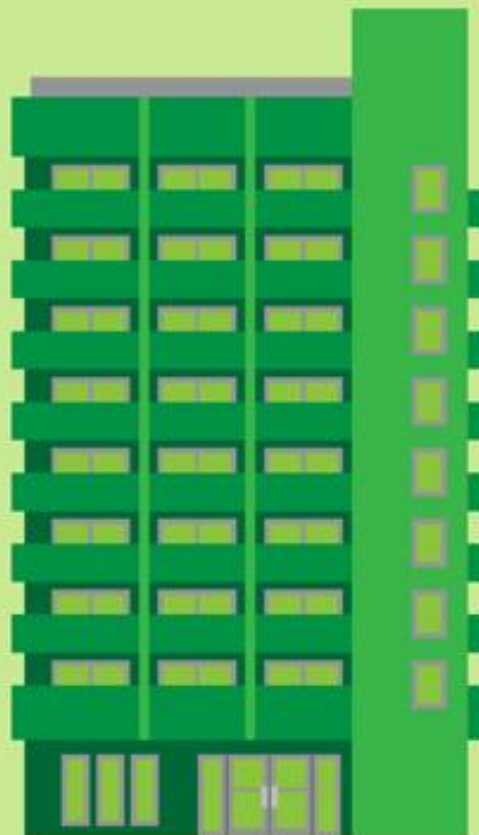
80% of companies supporting BYOD have more than 2,000 employees.



50% of companies with BYOD models require employees to cover all costs, and they're happy to.



45% of BYOD companies give their employees a stipend to help subsidize the cost of their device or service plan.



Of companies that responded:



72.2% currently support BYOD



14.8% considering, but no specific timeframe



3.9% plan to support BYOD in next 12 months



9.3% not planning to support BYOD



Mobile Growing in Higher Ed

Many expect mobile computing to become an integral part of higher education...

“Universities should consider treating mobile practices similar to the Internet in terms of importance, resources, and development”

Expectations of heavy to very heavy demand for mobile IT in four areas

Research  **9%**

Administration  **10%**

Instruction  **20%**

General communications  **35%**



90% of respondents expect spending on mobile-enablement to rise over the next three years.



92% of institutions are providing some level of support—at no charge—to users of mobile devices.*

*Source: EDUCAUSE Core Data Service, educause.edu/coredata



Many are Watch and Wait

...but many colleges and universities are watching and waiting.

"Making mobile apps a priority in terms of cost and time is not core, in my opinion. We just have to wait for the market or institutional collaboration to mature."

38% say they mobile-enabled

ZERO

services in past 12 months

35% report

ZERO

spending on mobile

19% say they have

ZERO

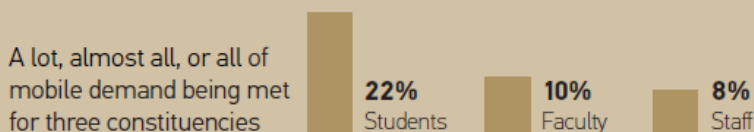
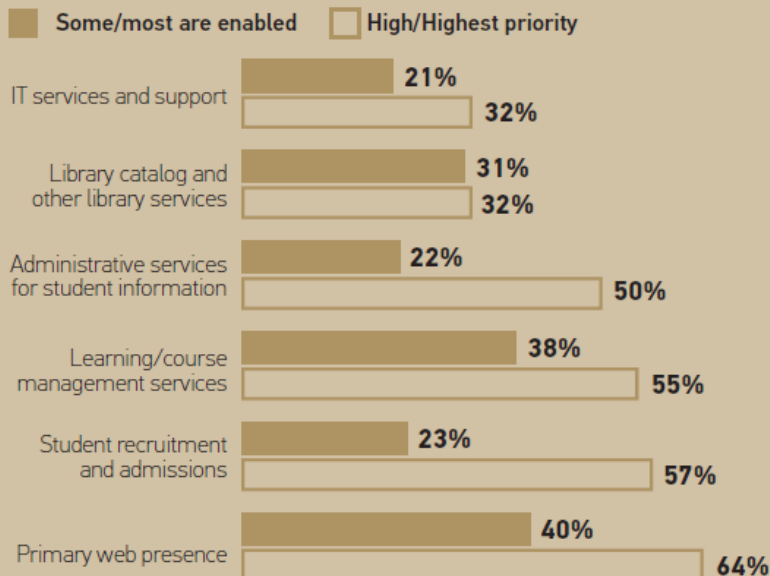
FTEs working on mobile



For those that are working on mobile initiatives, students are the focus.

"[The killer mobile app would be] any that helps students with learning and support services."

Priority and level of enablement for student/public services



Institutions that agree they are prepared to meet expected mobile demands for the 2011–2012 academic year in these areas:



* Among only institutions reporting a research-focused mission



University Mobile Collaboration

- Collaboration between central and distributed IT groups
- Manage Apple and Android developer licenses
- Apple Applications
 - **WolfWalk** - A photographic guide to the history of NC State University.
 - **WolfMatch** - A free Match 3 game from NC State Distance Education
 - **MySchedule** – Mobile access to students class schedule and mapping
 - **MicroExplorer 3D** – Mobile microscope training tool
 - **Mobile Video Framework** – Mobile training video tool – How to videos
- <http://m.ncsu.edu> mobile website (Android & iOS)





Social Media - <http://twitter.ncsu.edu>

- Aggregates all of NC States (nearly 200) twitter accounts into a single feed.
- Collaboration:
 - **Outreach Technology** provides back-end integration with Twitter
 - **University Communications** provided user interface and design
- Outreach:
 - Source: <https://github.com/jfaustin/Tweet-gater>
- Training: Effective use Twitter to communicate

The screenshot displays the 'NC STATE ON TWITTER' website. At the top, it features the university's name and a red cardinal mascot. Below this, the 'Our Network' section explains that the site aggregates official NC State Twitter feeds. A navigation bar includes links for '@nc state', '#nc state', RSS updates, following on Twitter, and watching videos. The main content area is titled 'Tweets from NC State' and lists four tweets with their respective icons, text, and timestamps. A sidebar on the right contains sections for 'What is Twitter?' and 'Twitter Resources'.

NC STATE ON TWITTER

Our Network

Throughout the "Twitterverse", NC State University has remarkable stories to share. Here, you'll find a collection of official NC State Twitter feeds to help you stay on top of what's happening right now.

[Official twitter feeds >](#)

[@nc state](#) [#nc state](#) Get RSS Updates Follow us on Twitter Watch our Videos

Tweets from NC State

- [sysnews](#) NelNet outage <http://t.co/BV9s2x8s>
16 minutes ago from [SysNews Tweeter](#)
- [NCSUGreek](#) We're looking for leaders. Register now for @NCSUJFC Fraternity recruitment at <http://t.co/nTwMRyjE> #getinvolved
21 minutes ago from web
- [ncsuadmissions](#) Check out some of the amazing @NCSUCHASS students! <http://t.co/AuRZXJQP>
24 minutes ago from web
- [gibtcenter](#) Dine and Discuss, Origins and Implications of Gender Stereotypes, Thurs. 8/23, 12pm, 330 Harrelson Hall with Dr. Betsy Crane.
35 minutes ago from [HootSuite](#)

What is Twitter?

Not sure what Twitter is all about? Check out this brief introduction.

[Read more >](#)

Twitter Resources

- [Mashable's Twitter Guide Book](#)
- [Twitter for Business \(Twitter 101\)](#)
- [We Follow](#)
- [Twitter Software](#)



Instructional Technology is Rapidly Changing

- Technology causes disruptive change
 - **Skype** and the telecommunications industry; Professors are “Skyping” their students
 - **Twitter** - professors tweeting changes to assignments and reminders.
 - Flip side, students are twittering in class if they are bored!
 - The Plant Pathology **vLab**
<http://courses.ncsu.edu/ww201/common/game/index.html>. (It'll take a while to load so be patient)
 - **MOOC** – Massive Open Online Courses (200,000 students, get “certificate”)
- We must allow and support people to explore new innovations



vLab to Diagnose Plant Disease

PP315 Plant Pathology vLab *Disease Diagnosis* View Lab Stations

Welcome to the Lab!

Technician,

Welcome to the Plant Pathology lab, where you will conduct tests on a tomato plant. We have charged you with the task of identifying the pathogen responsible for the disease of this specimen.

You will be guided through a series of processes that will lead to your eventual hypothesis, observation, testing, and diagnosis of the plant specimen. After completion, your work will be sent to your e-mail.

Various tools will aid you in your use of the lab, take a moment to familiarize yourself with them during your introduction. If you have further questions, the question button in the lower left of the game screen will provide valuable information when clicked.

Dr. Shew

Your esteemed colleagues

The specimen

Navigation: You Are Here

Notes Log Data

No notes entered

Proceed

Observation Hypothesis Host Index Testing Diagnosis Collected Samples

New Note



PP315 **Plant Pathology vLab**
Disease Diagnosis

View Lab Stations

Navigation

Notes Log Data

No notes entered

Skip Instructions

? Observation Hypothesis Host Index Testing Diagnosis Collected Samples

New Note



Instructional Technology Sampler

- Enterprise: Learning Management Systems
 - Moodle, Blackboard, Sakai, OpenClass
- 90% of two and four year colleges are using an LMS
(Bates & Sangra, 2011)

- Content Capture

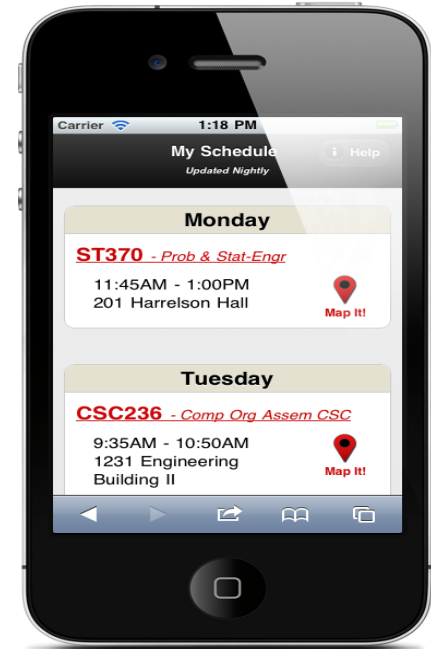
Vs

- Emerging
 - Sharepoint (as LMS), Google Sites, Tumblr, Scoop.It, Google+, Facebook, CISCO WebEx Social



Around COE Mobile for Students

- Computer Science department using Android devices for JAVA programming courses
- Campus wide Mobile Task Force
 - Set up new mobile security guidelines
- My Schedule application developed to deliver a student's course schedule tied with map data
 - Ties into Engineering maps data to locate course's building
 - Find people included also using maps
 - Provides instructor information and location from directory services





It's here...how to embrace and support it.

2.

WHAT'S THE RIGHT POLICY?

GOOD



**ESTABLISH
A CLEAR POLICY**
limiting the number
of devices.



Average number of
connected devices
per worker is
expected to reach

**3.3 BY
2014**

BAD

BUT DON'T OVERDO IT!



Leave enough of a selection
that employees still feel like
they have a choice.

UGLY



Don't announce
a BYOD
program
without any
policies set
in place! That's a

**RECIPE FOR
DISASTER**



A growing area for NC State...

- Students and employees expect to access campus services from personally owned devices.
- Google Apps for Education is our messaging platform (faculty, staff & students)
- More use of cloud technology (e.g., Google Drive, DropBox, etc.)
- More sensitive data and legislation
- More diversity of devices and software
- Setting service expectations is crucial
 - 24 hour support



How to access services, not how to use the device.

4. WHAT'S THE IMPACT ON I.T.?

GOOD



Minimize IT involvement with BYOD users: deploy a centralized mobile device management solution for IT admins to manage the

WHOLE DEVICE FLEET

BAD



DON'T ABANDON
BYOD users: they carry most responsibility for device and software maintenance, but should still have IT available.

84%



of businesses both
ALLOW & SUPPORT
employee-owned devices

UGLY

DON'T OVERWHELM YOUR I.T.



Create set hours when IT will be available for one-on-one problems or build a robust internal site with resources that employees can turn to when they need assistance.





Who is responsible?

University responsibility

- Establish device standards (browsers, mobile platform/OS, etc.) and communicate to clients.
- Provide configuration information for key University-provided services (email, calendar, etc.)
- Support connections to key services

Client responsibility

- Ensure that device is functional—can it connect to services off-campus?
- What data is on the device and is it secure?
- Report loss/theft of the device quickly.



3. WHAT'S THE EMPLOYEE'S ROLE?

GOOD

ENGAGE & EDUCATE

employees with device workshops.



BAD



PROVIDE DEVICE GUIDELINES

highlighting strengths and weaknesses, but let employees make the final decision.



6.8 MILLION:

Number of Android and iOS devices activated last Christmas Day

UGLY

Don't ban devices

FOR NO REASON



Evaluate and move quickly to bring new technology into the fold.



Key Business Decisions...

- Can employees use personally-owned devices for their work?
- If so, what are your requirements of them?
 - Security standards
 - Data retention requirements
 - Data compliance requirements



Stipend for personal mobiles

- Support employee personal preferences
- Potentially reduced cost for organization
- Apply policy to personal device usage
- Avoid multiple mobile devices
- Avoid personal use of state owned devices
- Inventory and some control



Protect the data, allow access

5. HOW DO WE TACKLE SECURITY?

GOOD

PROTECT YOUR NETWORK

Keep BYOD and corporate-owned on separate Wi-Fi networks.



VPN, mobile device management and network-access control are must-haves for any BYOD enterprise.



of companies have rolled out a BYOD security strategy

BAD



AVOID

launching a BYOD initiative before doing a thorough audit of your network.

UGLY

KEEP YOUR NETWORK SECURE,

BUT DON'T BAN THINGS LIKE
REMOTE ACCESS



of Cisco employees work at least 20% of the workweek at home



Current Security Summary

- Focus on central site protection
 - Focus on keeping intruders and malware out
- Focus on user education
- Multiple solutions
- Moving towards more automation
- Setting regulations for encryption



Moving forward...

- Personal devices are here to stay.
- New services should be designed with personal devices in mind.
- In the workplace, don't confuse workplace behavior with technology.



It is not the strongest of the species
that survives, nor the most intelligent,
but the one most responsive to change.

~ Charles Darwin ~