1. The Role of Mobile Devices in Pre-Service Teacher Education Programs

Kim Lawrence & Norm Vaughan

Overview

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1. DEFINITION

The Now Network – YouTube Video Clip

bnnn

http://www.youtube.com/watch?v=TwkPPo6-i9M

Mobile Learning

How do you define this term?

increase access
flexibility
anytime, anywhere
24/7

personalization of learning
portable

. . . the exploitation of ubiquitous handheld technologies, together with wireless and mobile phone networks, to facilitate, support, enhance and extend the reach of teaching and learning
http://www.molenet.org.uk/about/

EDUCAUSE Learning Initiative
Highly mobile devices
- Cell-phone sized devices that can fit in a pocket: feature phones (supporting cell and SMS service only), smartphones, and other devices like Flip cameras.

Very mobile devices
- Slates, pads, and netbooks.

Mobile devices
- Larger devices such as laptops

http://net.educause.edu/ir/library/pdf/ELI3022.pdf

Mobile Learning: Transforming the Delivery of Education and Training
M-learning
- Delivery of electronic learning materials, with built-in learning strategies, on mobile computing devices to allow access from anywhere and at anytime.

E-learning
- Delivery of electronic learning materials on desktop and notebook computers.

Edited by Dr. Mohamed Ally, Professor, Athabasca University, 2009
http://www.aupress.ca/books/120155/ebook/99Z_Mohamed_Ally_2009-MobileLearning.pdf

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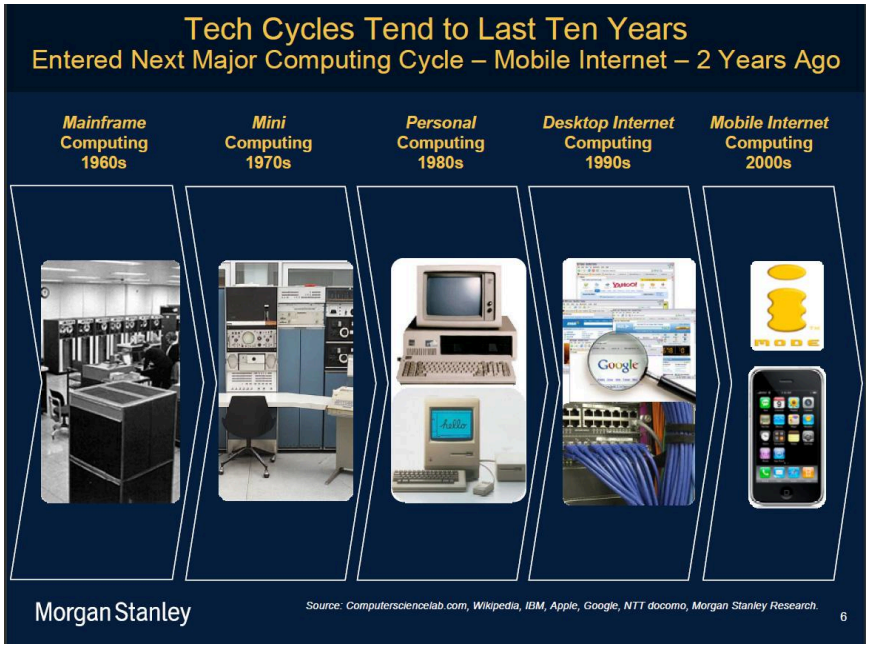
2. TRENDS

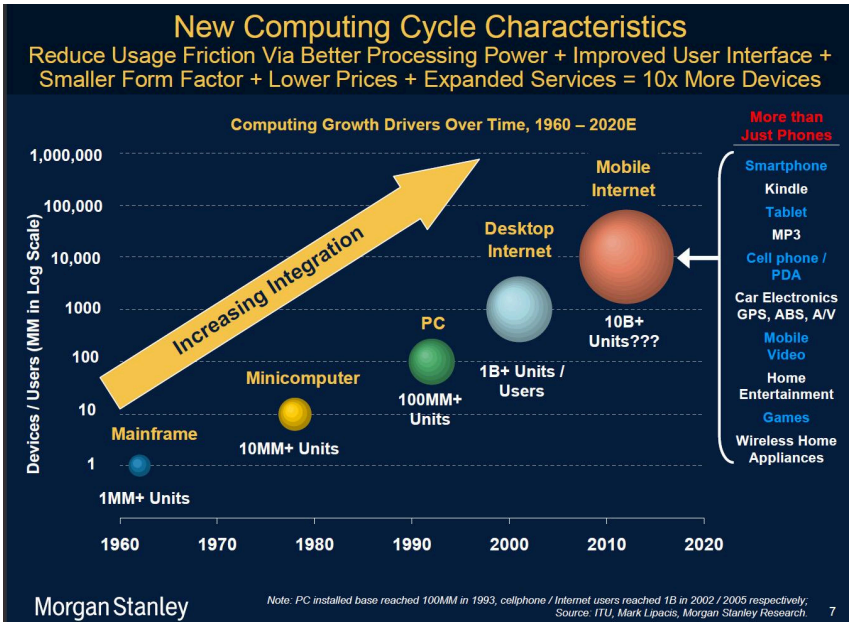
Mobile Phone Trends

- 4.6 billion subscriptions – 68% of planet
- 3.4 billion unique users – half the planet
- 1.2 billion PCs (including notebooks)
- 3 x as many camera phones in use today than any kind of stand-alone camera, digital or film-based – ever manufactured
- 1.39 billion handsets sold last year compared to 270 million new PCs
- More internet users on mobile than on personal computers
- Saudi Arabia **-** 39.5 million subscriptions in total, a 138% penetration rate

Tomi Ahonen Almanac, 2010
http://www.tomiahonen.com/ebook/almanac.html

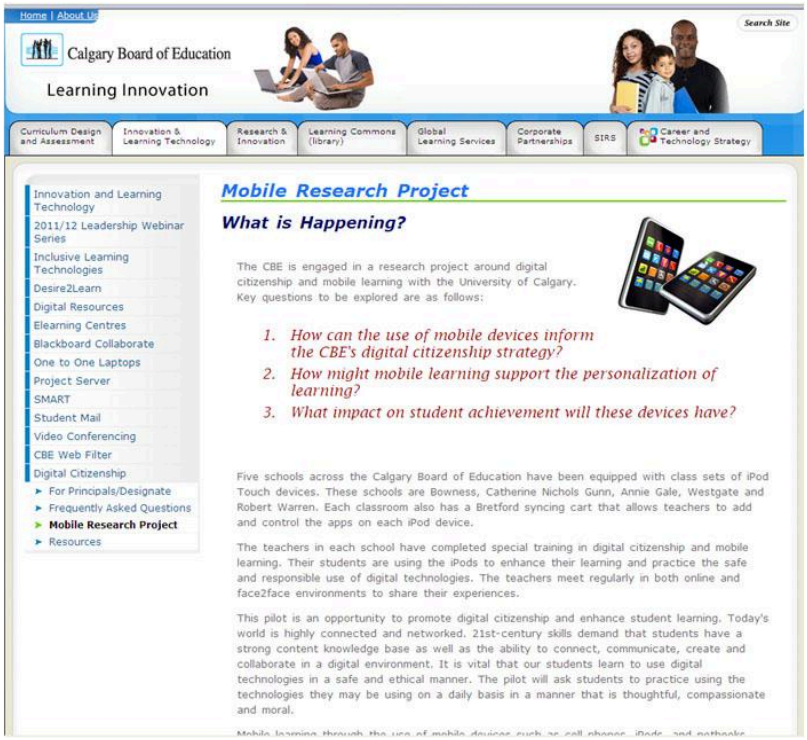
Technology Cycles





Morgan Stanley
http://www.morganstanley.com/institutional/techresearch/pdfs/Internet_Trends_041210.pdf

Calgary Board of Education



http://www.innovativelearning.ca/sec-learntech/webdig-mobile.asp

Calgary Catholic School District

http://www.cssd.ab.ca/default.asp?MARK_SEARCH=YES&SEARCH_ID=s1&V_ITEM_ID=1741

Rocky View Schools

http://www.rockyview.ab.ca/home/engaging-21st-century-learners

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3. OPPORTUNITIES & CHALLENGES

Seven Principles of Good Practice in Undergraduate Education
1.encourages contact between students and faculty,
2.develops reciprocity and cooperation among students,
3.encourages active learning,
4.gives prompt feedback,
5.emphasizes time on task,
6.communicates high expectations, and
7.respects diverse talents and ways of learning.
Chickering and Gamson (1987)
http://www.tltgroup.org/programs/seven.html

Opportunities	Challenges

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4. STUDY QUESTION

Exploratory Study

- If and how mobile devices can be used to support student learning in a pre-service teacher education program?

1. What kind of mobile devices do students and faculty currently own and what kind of applications do they use on these devices?
2. How do students and faculty perceive that these devices could be used to support the draft *Alberta Professional Practice Competencies for K to 12 teachers*?
3. What recommendations and strategies do students and faculty have for effectively using mobile devices to support learning in a pre-service teacher education program?

Participatory Action Research

- *. . . a reflective process of progressive problem solving led by individuals working with others in teams or as part of a "community of practice" to improve the way they address issues and solve problems* (Wikipedia, 2011, n.p.)
- *Engages people who have traditionally been called subjects as active participants in the research process*
- *Results in some practical outcome related to the lives or work of the participants* (Stringer, 1999, p.xviii)

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5. CONTEXT

- Mount Royal University - Bachelor of Education Elementary Program
    - 4 year directed entry from high school
- EDUC2325 - Understanding Current and Emerging Pedagogical Technologies
- Education students and faculty *actively participated* in this study during the fall 2011 semester

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6. METHODOLOGY – FALL 2011

Education Students

- All students enrolled in the EDUC2325 course had access to a *Dell ViewSonic Tablet* for the entire semester
- Completed a pre-course online survey
- Added on-going ideas to a “research wiki”
- Will also complete a post-course online survey and hopefully participate in a post-course focus
- group
- n = 14

Education Faculty

- Education faculty participated in 30 minute interviews
- Added on-going ideas to a “research wiki”
- n= 6

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7. PRELIMINARY FINDINGS

SMART Phone Ownership

	Students	Faculty
SMART Phone Ownership (web-enabled)	92%	33%
Type of SMART Phone	Blackberry 64% iPhone 36%	Blackberry 100%

Vendor	2010 Unit Shipments	2010 Market Share	2009 Unit Shipments	2009 Market Share	Year-over-year Change
Nokia	453.0	32.6%	431.8	36.9%	4.9%
Samsung	280.2	20.2%	227.2	19.4%	23.3%
LG Electronics	116.7	8.4%	117.9	10.1%	-1.0%
ZTE	51.8	3.7%	26.7	2.3%	94.0%
Apple	47.5	3.4%	25.1	2.1%	89.2%
Others	439.4	31.6%	342.9	29.3%	28.1%
Total	1388.6	100.0%	1171.6	100.0%	18.5%

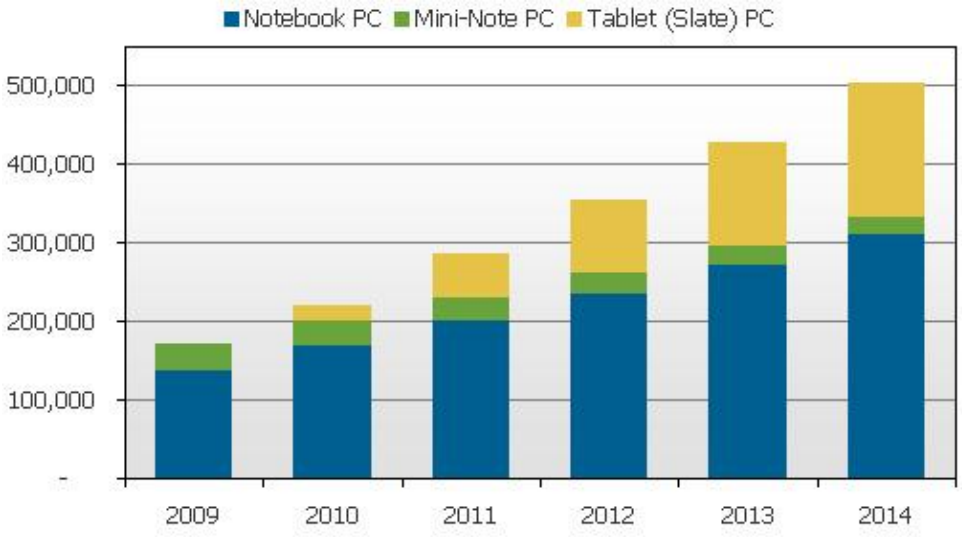
International Data Corporation (IDC), 2011 (millions of units)
http://www.engadget.com/tag/idc

Tablet Ownership

	Students	Faculty
Tablet Ownership	7%	33%

Type of Tablet	iPad 100%	iPad 100%

Tablet PCs



1000s of units
Consumer Lifestyle News
http://www.cln-online.org/

India launches $35 tablet computer
CTV News, October 5, 2011
http://www.ctv.ca/CTVNews/TopStories/20111005/india-cheap-tablet-computer-launch-111005/

Laptop Ownership

	Students	**Faculty**
Laptop Ownership	100%	100%
Type of Laptop	Apple 43% Sony 17% HP 8% Dell 8%	iDell 67% Apple 33%

	Gateway 8% Asus 8% Acer 8%	

Laptop vs Desktop Ownership

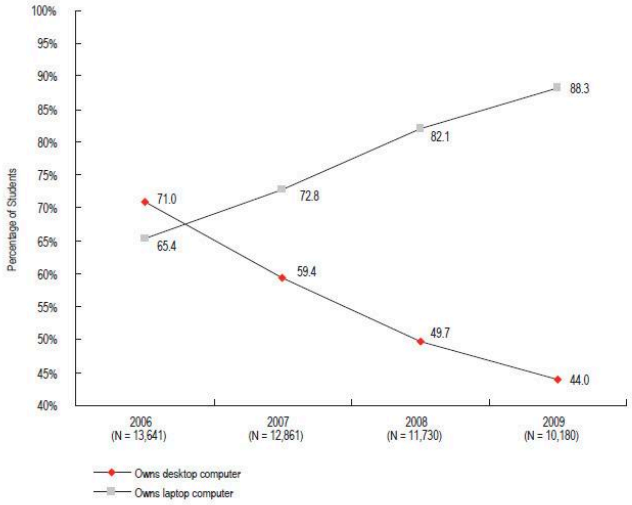


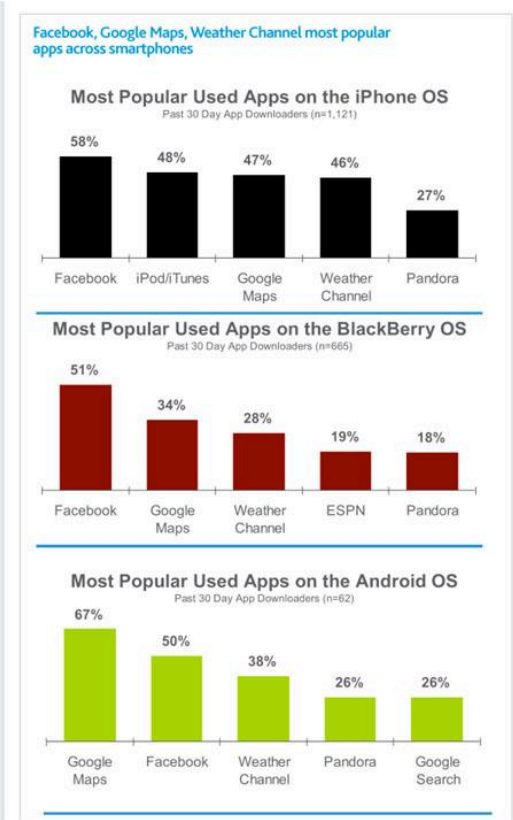
Figure 1-1. Change in Computer Ownership from 2006 to 2009 (39 Institutions*)

**Data are based on student responses from the 39 institutions that participated in each of the 2006, 2007, 2008, and 2009 studies. Although institutions remained the same, the actual students responding were different each year.*

ECAR Study of Undergraduate Students And Information Technology (2009)
http://www.educause.edu/Resources/TheECARStudyofUndergraduateStu/187226

Mobile Apps and Websites

	Students	**Faculty**
Web-enabled phone ownership	86%	33%
Frequently used mobile app or web site	Facebook 92% Google 75% myMRU 50% Twitter 33% YouTube 25% CBC 8% NHL.com 8% StumpleUpon 8%	myMRU 100% GPS 50%



Your Turn

Apple Apps **http://www.apple.com/iphone/apps-for-iphone/**	**Android Apps** **https://market.android.com/?hl=en**
Unit Converter **Evernote and Daily Note** **Popplet** **Dragon Dictation**	**Layar** Augmented Reality

Drop Box Ability to share files between devices (e.g. phone and computer) **Photosynth** Ability to take 360 degree panorama pictures **GoodReader** Multi-format file viewer **Evernote** For note taking on multiple platforms **Instapaper** Read it later **Twitter** **Facebook** **Reeder** RSS reader **iBooks** Reading textbooks, class notes,... etc. **1Password** **Kindle** eBook reader **QuickVoice** If an idea strikes you while you're out and about, use this app to make a voice note **BookShelf** Download this app to turn your iPhone into a book reader **Edmodo**	**Drop box** Ability to share files between devices (e.g. phone and computer) **Socrative** Clicker or personal voting app for classroom use **Gradebook** Edit your grade book directly from your phone! **Attendance** A simple and efficient way to take attendance with your Android device! All attendance results are saved to a Google Spreadsheet. **Grade Rubric** Simple tool to help professors and teachers make grade tallying more efficient **Grade Ticker** Simple tool grading tool for professors and teachers who use a grading rubric for assignments. Option to auto-generate an email with detailed grade report for student. **Chemical Equation Balancer Pro** Cost: $1.00 Features: Enter the reactants and products and then press balance, and this app instantly delivers results. Best For: Science teachers looking to demonstrate problem examples to their students. **CoursePro** Cost: $2.99 Features: Using a to-do style list, CoursePro allows users to define assignment types and keep track of weighted grades. Best For: Students looking for a way to organize their homework assignments, school projects, and grades. **Flash Card Maker Pro**

For iPhone makes it easy for teachers and students to stay connected and share information

Dictionary.com

Human Anatomy

Leafsnap
This free mobile app uses visual recognition software to help identify tree species from photographs of their leaves

My Math Flash Cards
Mastering basic elementary math facts

Word Lens
Best for: Language Classes
Cost: Free
Features: Instantly translates signage from one language to another through the camera application
How to Use: Language teachers can use this program for scavenger hunts

Molecules
Best for: Science Classes
Cost: Free
Features: Allows users to view and manipulate three-dimensional models of different molecules
How to Use: Visual learners can see how protein molecules are composed and can download
new molecules from the RCSB Protein Data Bank

Blackboard Mobile Learn
Best for: Students and teachers whose campuses already use Blackboard
Cost: Free
Features: Course listings, organizations users are involved in as well as access to any readings
How to Use: Users can enroll in any classes or organizations that they have registered for and

Cost: $2.95
Features: With text-to-speech capability and advanced gesturing functions, Flash Card Maker Pro uses multi-sensory learning techniques to help improve memory. Shake to hide memorized
cards, look at multiple decks at one time, or time how long it takes you to complete a deck.
Best For: Students or educators exploring new ways to retain information. Teachers can use this
program and create flash cards to help their students prepare for large exams, or put lesson
planning notes on them.

Google Sky Map
Cost: Free
Features: With the ability to turn your Android device into a —window to the night sky,‖ SkyMap shows the stars, planets, and other celestial objects in view when you point your device
towards the sky.
Best For: Teachers trying to use more compelling visuals during their astronomy units.

Gutenberg eReader
Cost: $2.99
Features: This app gives the user access to the entire Project Gutenberg eBook library, allowing users to search by author, subject, and titles to find the book they need quickly.
Best For: Teachers looking for an easy way to share passages with their classroom, or students
who want to research a topic without purchasing a book.

Grade Book for Professors PRO
Cost: $4.99
Features: Use the primary grade book on Google spreadsheets and sync it to all of your devices. Easily eMail grades to students and PIN-protect grades against accidental loss.
Best For: Teachers who want a new way to

download any assignments their instructors have posted

Today in History
Best for: History Classes
Cost: Free
Features: Lists notable events in history as well as important figures who were born or died on a
specific date
How to Use: Use for trivia quizzes or facts of the day

Math Ref Free
Best for: Math Classes
Cost: Free
Features: A free version of Math Ref, this app offers 600 out of over 1,300 formulas, figures, tips, and examples
How to Use: Use as a formula study guide or to view graphs of different equations

PI83 Graphing Calculator
Best for: Math Classes
Cost: $0.99
Features: With over 100 math functions, the graphing calculator is a clone of the TI-83 without
the $70 price tag
How to Use: Use in place of any calculator to input data, make graphs or matrices

Star Walk
Best for: Astronomy Classes
Cost: $2.99
Features: An astral telescope; Star Walk adapts its view to wherever the user holds it up to,
highlighting constellations and planets
How to Use: Use for guided tours of the night sky or to find the location of any specific astral objects

Cram
Best for: Anyone in need of test prep
Cost: $3.99
Features: Both teachers and students can streamline the grading process and a way to consistently backup their grades.

Tick!
Cost: Free
Features: A timer with an easy interface.
Best For: Educators looking for a way to count down the time left in a task for students to complete.

Trippo Mondo
Cost: Free
Features: A language translator, Trippo Mondo translates any phrase and speaks it out loud in the language chosen.
Best For: Foreign language instructors looking to increase students‘ knowledge of common phrases. Encourage students to translate different common phrases they hear during the day to
increase knowledge of colloquial terms.

Where‘s My Droid?
Cost: Free
Features: After hooking up your eMail account, this app allows you to locate any lost Android devices within a 30-foot area, complete with a Google Maps display of the location.
Best For: Teachers who want to be able to monitor the location of their electronic devices.

create flashcards and tests and import and share them with others How to Use: Use to study for standardized tests or exams, or create study materials for students **Essay Grader** Best for: Teachers pressed for time Cost: $5.99 Features: Essay grader comes with a bank of pre-written comments and helps teachers cut down on grading time without writing the same comments over and over again by hand How to Use: After assigning a grade, teachers can then eMail the grade sheet directly to the student or export it to the computer for editing and printing **eClicker** Best for: Teachers looking for classroom feedback Cost: $9.99 Features: Providing instant results, eClicker charts the class responses, showing which areas are understood and which need more work How to Use: Students select a response to a question composed by the instructor and are then able to participate without fear of being wrong, since only the teacher views the results	

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Mobile Digital Images

	Student	Faculty
Camera phone	93%	33%

Types of digital images captured	Friends 61% Family 46%	Family 100%
Uploaded to the web and shared	Facebook 29%	0% *Need to figure out how to download* *Pictures for publication*

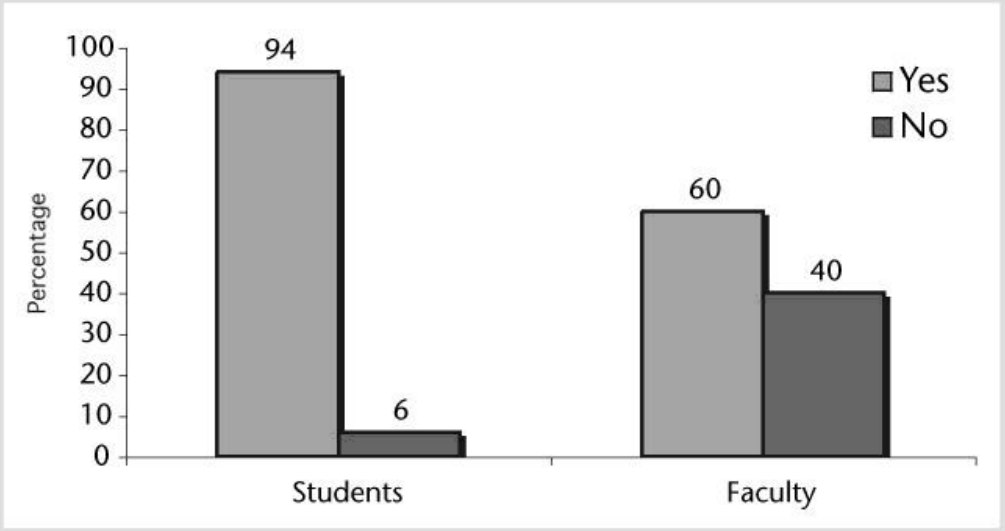
Mobile Digital Videos

	Students	**Faculty**
Video phone	79%	33%
Types of digital videos captured	Friends 64% Family 36%	
Uploaded to the web and shared	Facebook 10%	0% *Haven't used it yet* *Art techniques*

University of Texas, Brownsville, USA

Figure 3

Readiness for Mobile Learning



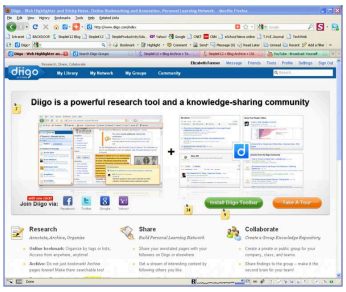
Are You Ready for Mobile Learning?
http://net.educause.edu/ir/library/pdf/EQM0726.pdf

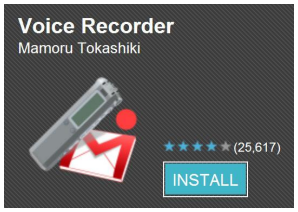
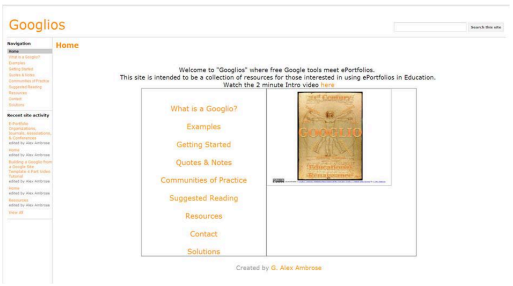
8. COURSE-BASED ACTIVITIES

Ideas on how to use mobile devices in education courses

Students	Faculty
• *Extend the classroom* • *Quick access to information* • *Enhance communication between students and teachers* • *Document learning through videos and pictures* • *Convenience – fits in my pocket*	**Documenting learning** *•Videotaping the process/pictures of writing or visual artwork* *•Lots of documentation of learning. Kids look at images of selves and better reflect.* *•Document learning in school placements- pictures, videos, audio on student work, interviewing teachers* **Access to programs and information**

	•Students can use to access different programs that are valuable. *•Texting for language development* *•Music apps* **Communication** *Can keep in touch with students. Texting, emailing* **Research** *Could be used for research* **Other** *No clue*

Application	Image
Googe Apps	
Diigo	

Picassa	
Voice Recorder	
YouTube	
Googlios (ePortfolio)	

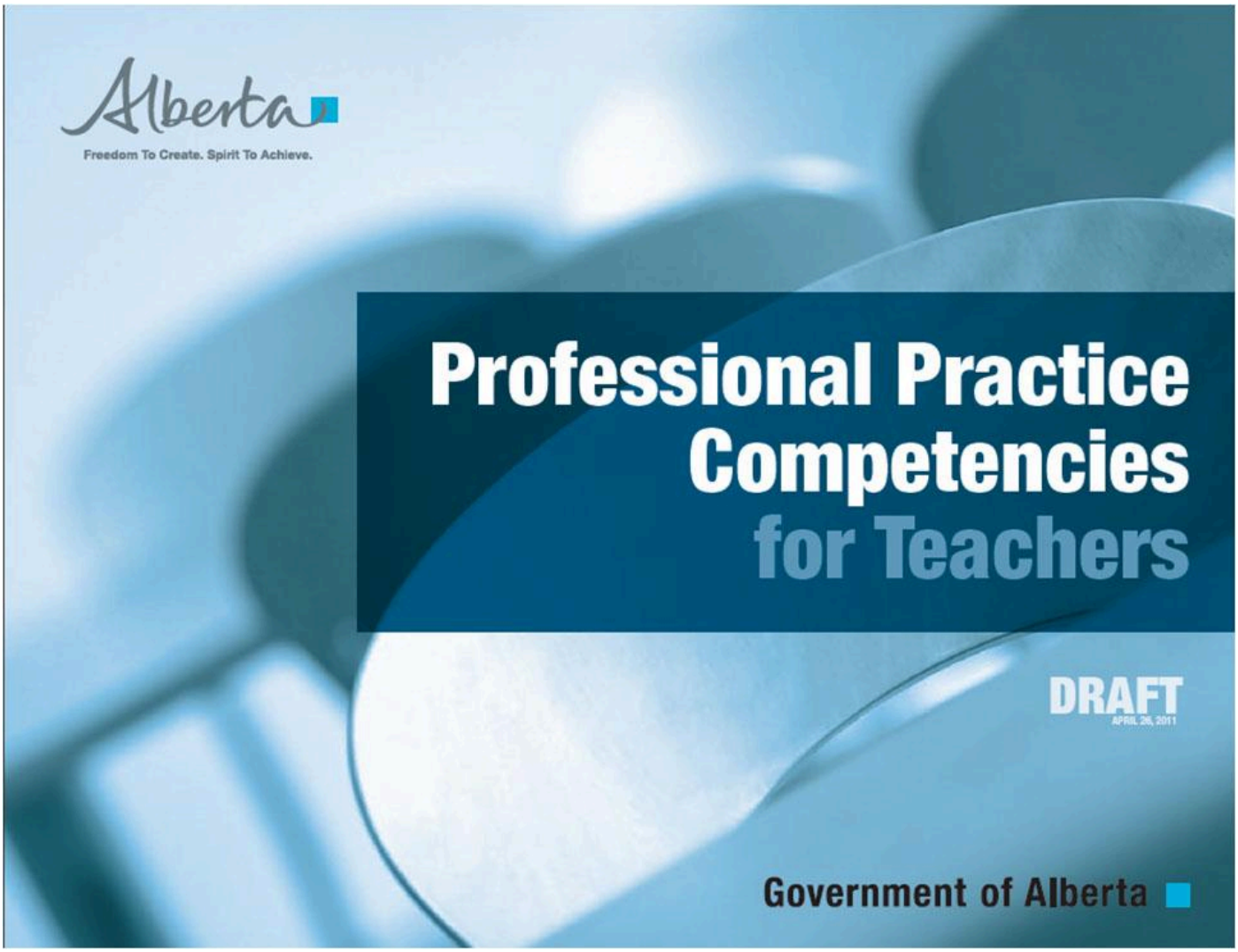
Your Ideas

Other Ideas

33 ways to use mobile phones in education

https://docs.google.com/present/edit?id=0AclS3lrlFkCIZGhuMnZjdjVfODgzZnNucW5zZGM&hl=en_US

Alberta Education - Professional Practice Competencies for Teachers



Alberta – Draft Professional Practice Competencies for K to 12 Teachers

Pre-April 2011	Post-April 2011

1.Planning for learning (e.g. lesson planning)	1.Creates a Caring, Safe and Respectful Inclusive Learning Environment
2.Assessing and evaluating student learning (e.g., marking)	2.Plans, Prepares and Assesses to Engage Students
3.Facilitating student learning (e.g., different approaches to teaching)	3.Communicates Effectively to Build Positive Relations
4.Managing the learning environment (e.g., classroom management)	4.Applies Creativity and Innovation in Teaching and Learning
5.Working as a professional educator (e.g., career-long learning)	5.Carries out Professional Responsibilities

Working as a professional educator

	Student	**Faculty**
Important/ Very Important	93%	83%
Related Comments	*It keeps you updated on the current and emerging technology. As a future K to 12 teacher this is very important not only to keep you up to date but to keep your class engaged by using technology that relates to their generation.*	*Convenience-anywhere anytime.* *Blogs- looking at other teachers and following people- if you follow the right people it will help keep you in the loop (twitter).* *Instant access to all kinds of teaching videos and recordings.* *Tools of the trade—important to know "first hand" the pros and cons of using mobile devices in K to 12 education.*

Facilitating student learning

	Student	Faculty
Important/ Very Important	86%	83%
Related Comments	*Every student has a unique way of learning and by varying the method one uses to teach, teachers can meet the needs of more students.* *Mobile devices give us so many different ways to facilitate student learning. There are computer games designed for students to work hands on with all different types of curriculum. They also allow students access to more sources then just their teacher.*	*•Students learn in different ways and we teach in different ways* *•Facilitating student learning in different ways - making videos to help students (ex: philosophy, a math probe)* *•It's what the students are used to* *•Students' familiarity with these devices can potentially be valuable.* *•Planned research and planned documentation. Need to know why you are playing with it and how you will use it.* *•Being able to have everything at your fingertips.*

Planning for learning

	Student	Faculty
Important/	64%	67%

Very Important		
Related Comments	*Mobile devices are essentially computers. They allow teachers to lesson plan anywhere in the world. Teachers can do research or search for information at any time during the day.*	*Ready access to so many resources* *Quickly search for books* *Alberta Education Program of Studies Guides and Resources are all web-based – just a click away* *Caution: just because it's on the web doesn't mean it's valuable. Need to look at and know it is well researched.*

Assessing and evaluating student learning

	Student	**Faculty**
Important/ Very Important	50%	83%
Related Comments	Could be used to perform tests or surveys This will come in handy if instead of written comments, students can see their teacher or peers evaluating them through video for example. This could be a great way of inputting current grades into electronic form, especially if you are out of town (not near	*•These devices can be used to give richer feedback- e.g., video tape the student teachers doing the teaching. And then sit down and discuss video or can review their research paper and provide audio rather than text-based feedback.* *•Focus on process rather than just product. Have a video of a group working on things. Used*

	a computer) or if you're home computer decides to crash on you.	*to tape grade ones reading and let them listened to it to see what they needed to work on. Self-assessment. Watch video of self (presentation)* *•See work in process- experiment, writing, visuals.* *•Need to look at how secure, cut out problems with cheating*

Managing the learning environment

	Student	**Faculty**
Important/ Very Important	29%	33%
Related Comments	*Could be a distraction for children* *Could be a useful tool because the students can easily stay engaged using various devices and they are many different options when using technology to control the classroom.*	*Distracting, kids online when should be paying attention* *Can make it more complex. Adding another diversion.* *Debating whether value of the tool overcomes some of the classroom management difficulties/problems* *Can see some minor advantages in change of pace. Special needs e.g., Brail iPad.* *Potentially could help manage learning environment. Have more personalized learning environment: meaningful projects, less discipline problems.*

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Educational advantages of using mobile devices in education courses

Students	Faculty
• *Quick access to information* • *Staying "connected"* • *Learning how to use emerging technologies*	• *Access to so much more information, websites, programs, faster, easier* • *Plays into what the students are used to* • *Visual. See firsthand what students learned* • *Reflection and self learning* • *Probably a lot, don't know of any*

Educational disadvantages of using mobile devices in education courses

Students	Faculty
• *Distraction – 79% of responses* • *Cost* • *Reliability*	**Distraction** *Divides students' attention - can cause to be off task if teacher doesn't use in a focused manner* **Surface vs Deep Learning** *•Perception (to little children) that it's all about games* *•Superficial communication rather than deep and meaningful engagement with others* **Cost & Technical Problems** *•Devices are expensive because of the locked-in service plans* *•Blurred images* *•Also battery can die* **Ethics** *FOIP - can't take pictures of each other*

Additional comments about using mobile devices in education courses

Students	Faculty
• *I am extremely happy that we have been chosen to use the mobile devices because it will be a new and engaging learning experience and it will greatly aid us in the near future during our teaching careers.*	**Future Trend** *•We will use them more. great way for students to document learning and experiences and being able to reflect on them* *•It's the way of the future and the teachers being trained need to learn to make the most of advantage of the devices* *•Emerging technology—need to have a conversation with education students in all courses— How to use in a professional manner to support learning and how do we use in an ethical manner to make sure that we are professionals and not endangering our job?*

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9. NEXT STEPS

•Post-study student survey – Dec 2011

•Analyze data and prepare report – Winter 2012

•WestCAST (Canadian Association of Student Teacher) Conference Presentation – Feb 2012

•CSSE (Canadian Society of Studies in Education) Conference Presentation – May 2012

•AERA (American Educational Research Association) - submit paper for presentation – July 2012

•IJMBL (International Journal for Mobile & Blended Learning) – submit paper for publication – July 2012

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10. FINAL THOUGHTS

• In his *Mobile World Congress* keynote address, Google CEO Eric Schmidt describes the mobile ecosystem as a confluence of:

– **computing power**
– **connectivity**
– **cloud computing**

and proclaims a new focus for the industry: putting **mobile first.**

Eric Schmidt at Mobile World Congress
http://www.youtube.com/watch?v=ClkQA2Lb_iE

Pomegranate Phone

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11. RESOURCES

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