Instructional Design for Mobile Learning

Principles for Making Mobile Learning Work

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Agenda

• Introduction and Overview
  – What is Mobile Learning
• Learning Theories
• Design Principles
  – Delivery Methods
  – Examples
• Where Do I Start?
The University of Central Florida

- Orlando, FL
- Largest Undergraduate Population in the US.
- 2nd largest Campus Univ. in US
- 2nd highest number of CS grads
- 2nd Game Design (Princeton Review)
- 2012-13 enrollment exceeds 60,048 (8/30/12)
- 12 Colleges & 216 degrees

New College of Medicine launched in 2009

The Institute for Simulation and Training
Research Institute, 30 years, $200M, 280 Employees
Mixed Emerging Technology Integration Lab (METIL)

- **Learning, Performance & Well-being**
- **Mobile Games and Simulations**
- **Virtual Worlds**
- **Collaborative Technologies**
- **Web 2.0 and beyond**

**SuperNutrition**
- Multi-platform Facebook-style social game for teaching 9-12 year-olds about nutrition and energy

**McGraw-Hill**
- Interactive medical iPad apps

**Microsoft**
- Mobile SCORM-conforming courses

**TeamSTEPPS**
- Patient Safety Mobile App

**Johnson & Johnson PRD**
- 3D University
  - Corporate Mobile Learning, Virtual Worlds and KM/Collab

**Combat Medic**
- Multi-modal game-based training for Army field medics (physical cards and mobile app)
What is Mobile Learning (mLearning)?

- eLearning Guild: mLearning is any activity that allows individuals to be more productive when consuming, interacting with, or creating information, mediated through a compact digital portable device that the individual carries on a regular basis, has reliable connectivity, and fits in a pocket or purse.

- Wikipedia: M-learning is the term given to the delivery of training by means of mobile devices such as Mobile Phones, PDAs and digital audio players, as well as digital cameras and voice recorders, pen scanners etc. M-learners are seeking lessons in small, manageable formats that they can undertake when it suits them.

- Other definitions? Post to the chat window

- BONUS ROUND: Who has a definition for a MOOC?

http://en.wikipedia.org/wiki/Mobile_learning
The Golden Triangle
Value Creation Model

Mobile

Social

Realtime

Source: VentureWire
Needs Analysis

• Desired learning outcomes
• Organizational requirements
• Device selection and availability
• User context
  – Location
  – Time
  – Accessibility
  – Usability
  – Learning styles
  – Motivation
Learning Theories for New Delivery Models

• Design and delivery models are finally catching up and enabling some of our most novel learning design models
Authentic Learning

• “By its very nature, anytime, anyplace learning assumes that the learner starts with a need and a motivation for some information that will help him perform an immediate action. The essential modes of work when mobile change and become very self-directed and communicative.”

(Metcalf, mLearning 2003)

• Personal experiences
Constructivism

• Allowing learners who understand their context and know (to some degree) what they need to learn build their own paths through learning material is the fundamental tenant of constructivism. It is also sometimes called discovery learning.
Learning Theory Mashup (LTM)

• We produce technology mashups to match the right technology to the right audience, context, need, content.
  – Smaller, discreet elements of technology are combined in new and unique ways, smarter, faster and cheaper than large systems/software

• Mobile technology and mashup strategy enables us to have mental scaffolding and a launchpad for many learning theories to be logically linked in a cohesive curriculum
Learning Theories

• Many learning theories blended together - based on each learning objective
• Discovery Learning
• Jigsaw
• ITI
• GELS
• Connectivism
• Outcomes
1) Develop Once, Deliver Many

- Deliver for mobile and desktop from one base of code
  - HTML5, Tin Can
- Examples- Cards, Mobile, VW, Games/Sims
Johnson & Johnson

• Won major industry learning technology awards for J&J PRD 3D University
  – Next generation learning solutions using a 3D environment

• Partnering with IST METIL to extend the Virtual World to MMOG levels and integrate mobile, games/simulations, and collaboration/KM

• Learning continuum across modalities
Emergency Medical Card Game
Delivery Modalities

- Combat Medic
  1. Combat Application Tourniquet
  2. Com... No Service
  3. Occlus... Hem... Ster... Need...
  4. Sc... Condition
  5. A casualty presents with an open chest wound
  6. Necessary materials and equipment: scissors, tape ≥ 2" or greater in width, exam gloves, occlusive material or HyFin® Chest Seal
  7. Surgical

- Practice
- Pro

Players:

- Draw
- Discard

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Integrating Mobile, Simulation and Cloud into Medical Curriculum

- Partnered with UCF College of Medicine in 2009 for strategic consulting and R&D:
  - Partnership development
  - Enterprise systems
  - Games
  - Simulations
  - Mobile
  - 3D
  - Health IT
Messaging vs Apps vs Web
• eLearning Guild Research – Email and Text messaging were the most popular mLearning delivery methods across 1000 companies, but in conjunction with podcast, apps, mobile Web, etc.
Mobile Applications

• Mobile Apps
  – Rich media-driven applications can be locally hosted on the device or dependent on Internet connectivity
  – Unique code base dependent on device platform
  – SDKs for each mobile OS (Apple, Android, Microsoft, Blackberry, etc.)
  – Allow for robust, high-end featurism
  – Costly development, complex approvals processes
  – Google’s open source Android platform
Mobile Web

- Web content displays in device browser
- Requires Internet connection
- Low-cost alternative to “app” development
- Allows for broad user penetration across multiple device platforms from a single code base
- Develop once, deliver many ...

Source: webcredible.com
Mobile Web Usability

• Compatibility Assessment
  – Ready.mobi

• Usability Guidelines
  1) Meet users’ needs quickly
  2) Don’t repeat the navigation on every page
  3) Clearly distinguish selected items
  4) Make user input as simple as possible
  5) Only show essential information
  6) Place basic browsing controls on the page
  7) Design mobile-friendly page layouts

Source: webcredible.com
Podcasting

• Potential Uses
  – An alternative or supplement to text blogging by delivering audio and/or video segments
  – Distribute Course material (lectures, notes, recordings)
  – Distribute recorded events
  – Modernize training
  – Create a more flexible training process
Apple’s iTunes U

- Apple is collaborating with schools to enable educators to use a mobile learning approach to education
- iTunes U
  - Hosted by Apple free of charge
  - Schools provide the content for distribution
    - Content can be audio/video resources students can share their independent podcasts
    - Also used to distribute recordings events
- Thousands of schools are participating, including half of the top 500 schools in the US, billions of course downloads
SMS / Text Messaging

- SMS Usability
  - Messages must be short and to the point
    - 160 character limit (with spaces)
      - Exact amount actually lower due to header info (length of header varies by carrier)
    - Many GSM handsets support the UDH standard for text message concatenation
      - Messages over 160 characters are automatically reassembled after transmission and display as a single message
    - CDMA handsets are incompatible with UDH
      - Messages over the limit are sliced apart (often in the middle of a word)
      - Separate parts may arrive out of order
Emerging Technology Integration

- MOOCs
- Location-based services (GPS, etc.)
- User-generated content
- Social networking tools
- Collaboration tools
- Query-by-Image content
- Barcode readers
Virtual Patients

- Dr. Juan Cendan, Dean of Simulation and Clinical Skills, UCF CoM
- Virtual Patients
  - NIH Grant for AI and CDSS
  - Pervasive Virtual Family simulation (online and mobile apps, email alerts, voice mail from patient actors using Moving Knowledge)
Mobile/Cloud Learning @ Google

- Interactive experience using Moving Knowledge for leadership, new product launch and presentation skills
- Represents a “gLearning” mashup with 7-8 Google tools- YouTube, Gmail, GoogleDocs, Moderator, GoogleTalk, etc.
- 1 Month curriculum created and produced in 3 weeks. 1 year program in 6 weeks.
  Time and Cost Efficient

~1000 participants
Pre- 30% start rate
Post- 94% finished
4.5/5 reaction

Moving Knowledge
Multimodal Delivery and Interaction

Google Apps thru Secure Cloud
2) mLearning is bigger than U.S.

- How many of you are from outside the US?

- What is the largest mLearning initiative you have seen?
2) mLearning is bigger than U.S.

Global initiatives-
Project M- 1B served-
HIV Campaign in S. Africa

Haiti initiatives-
leapfrogging us
3) mLearning- Integrated

- Not just stand alone courses or apps
- Peripherals
- Mobile EcoSystem- Projectors, Pens, Watch, Medical Devices, Mobile access to Enterprise and Cloud systems
  - Siri voice search
  - Watson voice-based AI expert mentor
The mHealth Universe (today)

Mobile Health [mHealth]- “the delivery of healthcare services via mobile communications devices”

• Public and population health
• Emergency response systems
• Professional and Patient communications (email, texting, social networking)
• Point of Care documentation
• Mobile synchronous (voice) and asynchronous (SMS) telemedicine diagnostic and decision support to remote clinicians
• Financial and administrative applications
• Clinical care and remote patient monitoring
• Health extension services
• Health services monitoring and reporting
• Consumer education
• Pharmaceutical clinical trials
• Health promotion and community mobilization

Krohn & Metcalf, mHealth, 2012
4) Technology Trends to Watch

• Social/Casual Games
• Peripherals
• Location-based/Satellite
• 3D- Scanners/Printers
• Mobile AR Visual, Aural
How Big is Mobile?

- Worldwide: Over 6.5 Billion Mobile Phones; Over 1 Billion Smartphones (CTIA, Merrill Lynch; Cahners InStat)
- US: ~100% penetration (Andrew Seybold)
- 80% of doctors have a smartphone (Jackson & Coker)
- 70% of doctors plan to buy an iPad or other tablet in 2011-12 (HIMSS)
- Mobile and Casual Games: ~$2.5 Billion (ESA; Pew)
- Significant CAGR- 36.5% (IDC, 2010)
- Mobile Games 16.6% CAGR
What is Gamification?

- Defined as the use of gameplay mechanics for non-game applications
- Creating simulations that mirror real-world environments
- Replace traditional courses with learning games and enabling gamers to learn as they play
The Case for Gamification

• “Facebook App Economy” approx. 200k new jobs, over $12b in wages and benefits in 2011 (TechCrunch)

• Analysts predict that by 2015, more than 50% of organizations will gamify their innovation processes. (Gartner)

• By 2014..more than 70% of Global 2000 organizations will have at least one gamified application... (Gartner)
Mobile MySportsPulse

• Science and Math education combined with sports through mobile learning

• Can be done through SMS, IVR, email or web browser
  – Voice recording or video from sports celebrities
  – Answer sent back and scored by automated system
  – Timed intervals that have been proven to produce learning outcomes and reinforcement
SuperNutritionGame.com

- Facebook-style mobile social game
  - Multiplayer
  - Multiplatform

- Teaches the new FDA food pyramid through eating for energy to perform missions that can get you enrolled in Superhero school
  - Target 9-12 yr olds
MINI iPad Game

THE MINI COUNTRYMAN TRAINING EVENT

STREET DRIVE B
POWER AND PERFORMANCE & YOU-IFICATION BENEFITS
Really Engaging Accounting in Second Life/Mobile

- Dr. Steven Hornik, UCF College of Business
- Avatar-based mentoring and facilitation
  - New FAQ AI capabilities to reduce instructor load
- Interactive Accounting Equations VW and Mobile
  - Creating concrete interactive models from abstract concepts
- Interactive T-Accounts
  - Accounting game-play, really!
- Increased engagement and performance (by 1 letter grade) in an 800 student class!
5) Developing our talent pool

- Processes, education, application
- MobiMOOC
- UCF Mobile Makers
- Need for Partnerships
MobiMOOC

• Inge de Waard- Founder
• Recruited 5 of us as faculty
• Close to 1000 students from across the globe
  – Varying levels of participation- low % completes
  – Constructivist/Connectivism- cMOOC
  – Measurable Results

• Slideshare: http://www.slideshare.net/ignatia
Partnership approach at Univ of Central Florida Institute for Simulation and Training

• Partners with similar vision
  – Public, nonprofit university
  – Compelling projects with the potential for global impact
  – International partnerships that meet the broad goals of UCF, and the Institute
  – We can be an academic partner that understands how to interact with NGOs, Government and Industry partners
  – Joint pursuit of grants

• Resource strategies for people, funding, and tools that create sustainable innovation
  – Spin-off multiple commercial entities and help launch/fund startup activities for students, faculty and our staff
  – Develop next generation leaders and technologists
Hepatitis B virus is an enveloped DNA virus belonging to the family Hepadnaviridae. It is unrelated to any other human virus known. The virus has a DNA genome that is essential for its replication. The virion is a large, complex structure consisting of a nucleocapsid and an envelope. The nucleocapsid contains the viral DNA, and the envelope is derived from the cytoplasmic membrane of infected cells.
## Table of Contents

1. Management of Shock
2. Initial Assessment
3. Blunt Abdominal
4. Trauma
5. Essentials of Burns
6. Penetrating Neck
7. Penetrating
8. Liver, Spleen, and...
1. MANAGEMENT OF SHOCK

- Shock is defined as a state in which tissue perfusion is inadequate to maintain normal aerobic cellular metabolism.
- Shock has been divided into 4 or 5 different types according to its etiology: Hypovolemic, Cardiogenic, Septic, Neurogenic, and Hypoadrenal.
- Hypovolemic shock is defined as tissue hypoperfusion resulting from inadequate intravascular volume. This
Allogy Incorporates Advancement in Learning Sciences

- Custom Coaching Algorithms
- Mentor Networking
- Embedded Assessments
- Analytics

Projected Forgetting Curve

- Chance of Remembering: 60, 70, 80, 90%
- Days: 10, 20, 30, 40, 50, 60
- First Reminder
- Second Reminder
- Third Reminder
- Fourth Reminder
- 90%
Answers to these 10 questions will get you started:

1. Why a mobile learning project?
2. What do you really want to do?
3. How you know when you have met your goal?
4. What unique result will you achieve?
5. What do you need to get it done?
6. For whom is your mobile initiative intended?
7. What will your stakeholders need to be successful?
8. How are you going to fund it?
9. How are you going to sustain it, and for how long?
10. How will you evaluate your effectiveness?

Credit: Ellen Wagner
Recommendations

• Look for opportunities
• Focus on user’s context and needs
• Build content in modular formats
• Assess readiness
• Begin with pilot initiatives
• Follow the market and be ready to move
Additional Information

- *mHealth: From Smartphones to Smart Systems*, Krohn & Metcalf, HIMSS 2012

- *mLearning*, Metcalf, HRD Press 2006
  - Pocketbook and Kindle formats available

- *Blended eLearning*, Bielawski and Metcalf, HRD Press 2005
  - Puts mobile in context of a larger blended OL, PS, KM perspective
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