Applying Learning Theory to Mobile Learning

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Disclaimer: Views and opinions expressed here are exclusively those of the presenters and do not represent the views of IBM in any form or fashion.
Thank you to *TD at Work* personnel who encouraged and helped us produce this booklet.
How do you define mobile learning?

- In the chat… what is your *domain* and how do you *define* mobile learning?
  
  - E.g., I’m at a *national retailer* and I define mobile as *what I need when I need it* (WINWINI)
  - E.g., I’m at a *bank* and I define mobile as *learning on a phone*. 
Definitions

**mLearning**

The acquisition of any knowledge and skill through using mobile technology, anywhere, anytime, that results in an alteration in behaviour (Geddes, 2004).

**LEARNING**

The provision of education and training on PDAs/palmtops/handhelds, smart phones and mobile phones (Keegan, 2002).

**TECHNOLOGY**

Any sort of learning that happens when the learner is not at a fixed, predetermined location or takes advantage of opportunities offered by mobile technologies (O'Malley, 2003).

**MOBILITY**

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 (Wikipedia).

**PERFORMANCE**

Any activity that allows individuals to be more productive when consuming, interacting with, or creating information mediated through a compact portable digital device that the individual carries on a regular basis, has reliable connectivity, and fits in a pocket or purse (The eLearning Guild, 2007).

**eLearning**

eLearning using mobile and wireless technologies, eLearning is defined as learning supported by digital tools and media (Milrad, 2004).
Goal

After this presentation you will have:

- A framework for thinking how about mobile learning fits the larger context of the training organization’s mobile strategy
- An updated and extended view of current research on mobile learning
- A summary of learning theories and mobile examples
- Guidelines to curate, design, purchase and evaluate mobile learning solutions
What mobile learning looks like to a lot of people

Primary differences between eLearning and mobile learning

1. Real Estate
2. Context
3. Duration

New technologies are always used to do old tasks – until some driving force causes it to be used in a new way

~ Marshall McLuhan (1964)
POLL QUESTION

Have you designed formal learning or informal learning to be delivered on a mobile device?

- Answer YES or NO
- And if yes, describe the program in chat
Formal Instruction & Informal Learning

POLL QUESTION

Would you agree with this statement; “In the last 7 years mobile learning has overcome many of the initial barriers to adoption. “

TRUE
FALSE
Research
## Research: Drivers and barriers of mobile learning

<table>
<thead>
<tr>
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</thead>
<tbody>
<tr>
<td>1. Increase learner/user access and availability</td>
<td></td>
<td>Increase learning access and flexibility</td>
</tr>
<tr>
<td>2. Accommodate learner/user needs</td>
<td></td>
<td>Increase on-the-job productivity</td>
</tr>
<tr>
<td>3. Increase speed of content delivery</td>
<td></td>
<td>Support organizational change and provide a faster response to changing business conditions</td>
</tr>
<tr>
<td>4. Improve learner/user performance</td>
<td></td>
<td>Increase the reach of learning solutions</td>
</tr>
<tr>
<td>5. Reduce costs</td>
<td></td>
<td>Increase the ongoing sharing of good practice</td>
</tr>
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</table>

<table>
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<tr>
<th></th>
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<tr>
<td>1. Content developed for other media does not transfer well to mobile</td>
<td></td>
<td>Cost of development, set-up and maintenance</td>
</tr>
<tr>
<td>2. Lack of standards</td>
<td></td>
<td>IT security issues</td>
</tr>
<tr>
<td>3. Security (vulnerable transmission)</td>
<td></td>
<td>Unreliable ICT infrastructure</td>
</tr>
<tr>
<td>4. Screen too small (affordances)</td>
<td></td>
<td>Wide variation in learner’s personal technologies</td>
</tr>
<tr>
<td>5. Limited bandwidth (infrastructure)</td>
<td></td>
<td>Complex to support</td>
</tr>
</tbody>
</table>
Research: What are the studies telling us?

- Big focus on perception
- K-20
- Blended solutions
- Academic versus industry research – be savvy
  - Two classes of research – academic and industry
    - Different standards and different agendas/purposes
    - Different levels of transparency
- Cautious transferability
- Much of the research is on adoption of technology and quantification of number of devices
Learning Theory
Formal Instruction & Informal Learning

Why care about theory?

**Instructional strategies** are the tactics that help people learn.

**Instructional theory** prescribes how to better help people learn.

**Learning theory** describes how learning takes place.
## Comparison of learning theories

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<thead>
<tr>
<th>Theory</th>
<th>Learning is equated with</th>
<th>Instruction focuses on</th>
<th>Strategies</th>
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<tr>
<td>Behaviorism (Do)</td>
<td>Changes in either the form or frequency of observable performance</td>
<td>Building and strengthening stimulus-response associations (environment)</td>
<td>Instructional cues, Practice, Reinforcement</td>
</tr>
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<td>Learner is reactive to conditions in the environment; passive</td>
<td></td>
<td>Recall facts, Illustrate concepts, Apply explanations, Follow procedures</td>
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<td>Cognitivism (What, How)</td>
<td>Discrete changes between states of knowledge rather than with changes in the probability of response</td>
<td>Efficient information processing to connect new information with existing knowledge in some meaningful way</td>
<td>Chunking, Feedback, Advanced organizers, Concept mapping</td>
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<td></td>
<td>Learner is viewed as a very active participant in the learning process (internal coding and structuring)</td>
<td></td>
<td>Apply reasoning to solve problem solving in new context</td>
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<td>Constructivism</td>
<td>Creating meaning from experience</td>
<td>The interaction between learner and environment; knowledge and behavior are contextualized</td>
<td>Situate tasks in real-world contexts, Multiple perspectives, Modeling and coaching, Reflection/debrief</td>
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<td>Learners actively build personal interpretations of the world based on individual experiences and interactions; elaboration and interpretation of information</td>
<td>Shift from <em>teaching</em> to <em>learning</em></td>
<td>Advanced knowledge in ill-structured domains, Solve problems</td>
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Mobile learning examples: Behaviorism

KANJI BOX (iPhone)

- Japanese language study
- Provides an efficient way to practice all aspects of Japanese (kana, kanji, character recognition, vocabulary, reading, writing...)
- Uses drills, quizzes and flash cards, while providing engaging feedback through progress charts, scores and game-like "achievements" for each Japanese level

Behaviorism
- Learner is passive participant
- Building and strengthening through stimulus-response associations (environment)
Mobile learning examples: Cognitivism

MX SkillMaster (iPhone)

- Role-play for sales reps (*Move the needle on performance*)
- Provides scenario-based practice in a customer service situation (banking, hospitals)
- Uses simulations, deliberate practice, observation (master video), advanced organizer (best practices video), feedback (mentor, scorecard), spaced practice, chunking

Cognitivism

- Learner is active
- Efficient information processing to connect new information with existing knowledge in some meaningful way

learning examples: Constructivism

Dow Day (iPhone)

- Take the role of a news reporter and investigate the different interests and perspectives of students, police and Dow employees (napalm protest – 2 days in 1967, UW-Madison) - given an assignment from the editor
- Uses situated learning, context-specific, location-based, real-life scenarios, game elements, discovery learning

Constructivism

- Learner is active
- The interaction between learner and environment; knowledge and behavior are contextualized
- Shift from teaching to learning

http://arisgames.org/featured/dow-day/
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The critical question instructional designers must ask is not “Which is the best theory?” but “Which theory is the most effective in fostering mastery of specific tasks by specific learners?”

- We need the behaviorist’s triad of practice/reinforcement/feedback to enlarge learning and memory.

- We need purpose, decision, values, understanding - the cognitive categories - lest learning be mere behavioral activities rather than action.

- We also need adaptive learners who are able to function well when optimal conditions do not exist, when situations are unpredictable and task demands change, when the problems are messy and ill-formed and the solutions depend on inventiveness, improvisation, discussion, and social negotiation.
Evaluating learning strategies for a given task

Level of Learner's Task Knowledge

How much prior knowledge of the subject?

Level of Cognitive Processing Required by the Task

Evaluating learning strategies for a given task

How much thinking effort is required of the learner and the demands of the task.

Evaluating learning strategies for a given task

Level of Learner's Task Knowledge

Low

High

Level of Cognitive Processing Required by the Task

Low

High

Constructivist Strategies
Cognitivist Strategies
Behaviorist Strategies

Formal Instruction & Informal Learning

Mobile learning examples: Information/Curation
Mobile learning examples: Performance support

Myfitnesspal (iPhone)
- Provides personal calorie counter/ converter/ recommender / exercise tracker
- At the point of need
- Not intentionally designed for learning

<table>
<thead>
<tr>
<th>Goal</th>
<th>Food</th>
<th>Exercise</th>
<th>Net</th>
<th>Remaining</th>
</tr>
</thead>
<tbody>
<tr>
<td>2480</td>
<td>2981</td>
<td>902</td>
<td>2079</td>
<td>401</td>
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<table>
<thead>
<tr>
<th>Baked Chicken Breast Fillet (Grilled)</th>
<th>165 cal</th>
</tr>
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<tbody>
<tr>
<td>Asda Smart Choice, 150 g</td>
<td></td>
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</table>

<table>
<thead>
<tr>
<th>Roasted Pepper and Courgette Salad</th>
<th>176 cal</th>
</tr>
</thead>
<tbody>
<tr>
<td>Tild, ½ packet!</td>
<td></td>
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<table>
<thead>
<tr>
<th>Organic Almond Butter</th>
<th>94 cal</th>
</tr>
</thead>
<tbody>
<tr>
<td>Meridian, 15 g</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Meal 3 (2:30pm)</th>
<th>435 cal</th>
</tr>
</thead>
<tbody>
<tr>
<td>Organic Almond Butter</td>
<td></td>
</tr>
<tr>
<td>Meridian, 15 g</td>
<td></td>
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</table>

News feed
- arouf1 burned 788 calories doing 97 minutes of "LISS (Walking Uphill) + Abs"
- 6 hours ago
- Comment

- chrislindlay6 completed his food and exercise diary for 11/10/2012 and was under his calorie goal. [View diary]
- 20 hours ago
Mobile learning examples: Performance support

Seller support (iPad)
- Provides product information, selling strategies, social support (Find the Expert), and customer collateral

Source: http://www.01click.net/
Use the chat window to share your experience.

What is driving your organization to deliver training on a mobile device?

Not using mobile learning yet? What drivers are you observing in other organizations?
Mobile Learning Pulse Survey Fall 2012

Current State of and Aspirations for Mobile Learning

Drivers for organizations’ interest in Mobile Learning:

Source: http://masie.com/Surveys/Page-2.html
Summary: Guidelines

▸ If you want your mobile learning to be useful and effective:
  • Start with a clear reason/purpose for going mobile
    – Business reason
    – Educational reason
    – Political / Organizational reason
  • Choose an appropriate type of learning for the device in use
    – What are you teaching?
    – What is the scenario/ context in which learners will consume training?
  • Optimize the design for mobile
    – Consider using mobile learning as part of a blended learning solution
    – Avoid the “create once use many” strategy
    – Leverage the device’s capabilities context awareness, built in tools
  • Conduct formative and summative evaluations - feedback, feedback, feedback
Thank You
References, Readings, and Resources


Recommended Readings


Resources

- **Mobile Learning** (curated site)
- **Mobile Learning Handbook** (ADL)
- **Mobile Learning Portal** (articles)
- **Mobile Learning: Everything an instructional designer need to know** (SH!FT)
- **Design Challenges and Considerations for Responsive eLearning** (Upside Learning)
- **KanjiBox** (iTunes)
- **Wall Street Survivor** ()
- **MX Skill Master** (Matrix Achievement)
- **Learning Theories** (PBWorks)
- **10 Tips for Designing Mobile Learning Content** (Elearning Guild)
- **mLearning is not eLearning on a Mobile Device** (Float Mobile Learning)