Instructional Design

For Mobile Technologies

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Things have changed.

This is how we used to begin our lecture on design...
What do you get when you cross a computer with...

...an Airplane?
What do you get when you cross a computer with...

...an Airplane?
What do you get when you cross a computer with...

...a Telephone?
What do you get when you cross a computer with...

...a Telephone?
What do you get when you cross a computer with...

...a Bank?
What do you get when you cross a computer with...

...a Bank?
What do you get when you cross a computer with...

...a Watch?
What do you get when you cross a computer with...

...a Watch?
You get a...

COMPUTER
Now, what do you get when you cross a computer with...

...a Teacher?
Just as we were understanding this relationship...
things changed.

[Diagram showing an image of a teacher with students, a laptop, a smartphone, and a child using a smartphone, connected by double equals signs.]
Enter the mobile device.
Again, a new mental model is required.
And mobile apps are different

• Inexpensive or free
• Available
• Single purposed
• Virtual and augmented reality
• Cultural
• Global
Mobile devices are everywhere
82 percent of adults own a cell phone, according to the Pew Research Center.
It is 1980 and the arcade-based video game Space Invaders was released in a format that ran on a home videogame console, the Atari 2600.
The Original Killer App

It is 1980 and the arcade-based video game Space Invaders was released in a format that Ran on a hope videogame console, the Atari 2600.

The New Killer App

It is 2007, only 9 years ago the iPhone first arrived with its mobile operating system. iPads came 3 years later and the iWatch appeared only recently.
Purpose and Awareness

• Making one’s presence public worldwide through seamless uploading of content

• Single purpose design

• Location centric
Access
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<th>DICTATION</th>
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<td>CLOSED CAPTIONS</td>
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Too much of a good thing

Happy Birthday to you! Happy Birthday to you! Happy Birthday dead husband! Happy Birthday to you!

Thanks. I assume you meant "dear."

Ahhhhh

Yes!!!! I mean that is a crazy autocorrect! Sorry babe.
Deus Ex Machina

“The more complex the device, the greater the number of potential side consequences.” – Stephen J. Gould, “Questioning the Millennium.”

Does our focus on designing every possible support into every tool that students use pose a potential problem? Are single-purpose apps a possible solution?
Instruction
UDL Guidelines

**Representation**
1: Provide options for perception
   1.1 Offer ways of customizing the display of information
   1.2 Offer alternatives for auditory information
   1.3 Offer alternatives for visual information

2: Provide options for language, mathematical expressions, and symbols
   2.1 Clarify vocabulary and symbols
   2.2 Clarify syntax and structure
   2.3 Support decoding of text, mathematical notation, and symbols
   2.4 Promote understanding across languages
   2.5 Illustrate through multiple media

3: Provide options for comprehension
   3.1 Activate or supply background knowledge
   3.2 Highlight patterns, critical features, big ideas, and relationships
   3.3 Guide information processing, visualization, and manipulation
   3.4 Maximize transfer and generalization

**Action and Expression**
4: Provide options for physical action
   4.1 Vary the methods for response and navigation
   4.2 Optimize access to tools and assistive technologies

5: Provide options for expression and communication
   5.1 Use multiple media for communication
   5.2 Use multiple tools for construction and composition
   5.3 Build fluencies with graduated levels of support for practice and performance

6: Provide options for executive functions
   6.1 Guide appropriate goal-setting
   6.2 Support planning and strategy development
   6.3 Facilitate managing information and resources
   6.4 Enhance capacity for monitoring progress

**Engagement**
7: Provide options for recruiting interest
   7.1 Optimize individual choice and autonomy
   7.2 Optimize relevance, value, and authenticity
   7.3 Minimize threats and distractions

8: Provide options for sustaining effort and persistence
   8.1 Heighten salience of goals and objectives
   8.2 Vary demands and resources to optimize challenge
   8.3 Foster collaboration and community
   8.4 Increase mastery-oriented feedback

9: Provide options for self-regulation
   9.1 Promote expectations and beliefs that optimize motivation
   9.2 Facilitate personal coping skills and strategies
   9.3 Develop self-assessment and reflection
Design Imperatives

There is much about teaching and learning that could be incorporated into a wide range of educational apps that are targeted (a) to the learner, (b) for a particular content, skill, or process, and (c) through an effective strategy.
Learner
Targeted
Students with disabilities

<table>
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<th>GENERAL FORM FOR ALL</th>
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<td>STUDENTS WITH DISABILITIES</td>
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**INSTRUCTION**

- Learning cues or prompts support complex tasks.
- Lessons can be interrupted and returned to without starting over.
- Problem solving, reflection, and creativity are promoted over rote learning.
- Ideas and concepts are shown in multiple representations.
- Small teaching sets simplify content.
- Strategies for transfer of skills are provided.
- A self-correction process leads student to the answer.
- Independent exploration is available and is encouraged.
- Outlining is used as a instructional strategy.
- Questioning is used as an instructional strategy.
- Repetition is used as a instructional strategy.
- Advance organizers, summaries, or outlines used as instructional strategies.
- Instructional transitions from one level to another include content overlaps.
- Important points or concepts are visually highlighted (e.g., bold).
- Software adapts to student input and branches to appropriate instructional level.

This software evaluation tool outlines specific instructional design elements for students with disabilities...based on the professional literature and a content-validity process.
Online help in the form of a tutorial, sequenced instruction, or directions is clearly important for students with LD.
Online support also has the potential for being used inappropriately...especially if the help features are not clearly connected to the content through close proximity or elapsed time.
Targeted Design Example
Here is a story about a poor woodcutter. He was very good at his work. He could swing his ax powerfully and cut down big trees. He would split them up into firewood to sell in the village. He made a good living.

But the poor man was not well educated. He couldn’t read or write. He wasn’t very bright either. He was always doing foolish things and getting himself into trouble. But he was lucky. He had a very clever wife, and she would get him out of the trouble his foolishness got him into.

When the woodcutter got into trouble, who would help him out?
Here is a story about a poor woodcutter. He was very good at his work. He could swing his ax powerfully and cut down big trees. He would split them up into firewood to sell in the village. He made a good living.

Click on the correct answer.

Why did the woodcutter cut down the trees?

- He needed wood for a house.
- He just didn’t like trees.
- He sold the trees for firewood.

Incorrect choice here...then 2nd attempt ➔

Affordance: boldface key text.
Constraint: One distractor removed.
Platform
Platform
We propose that accessible instructional design now must include not just the traditional alternative modalities for content delivery and interaction, but also attend to the learning proclivities of the intended users and **the type of device available to them**.
A new model

We envision a distributive model for the design of digital educational product that incorporates single purpose (targeted) instructional interventions that can be used independently or coordinated through an “executive function” or progress monitoring system.
A new model

In many ways, this distributive model already exists with the thousands of education apps available and in use.
A new model

We see them as a swarm of “learning-bots” available almost instantaneously for inclusion in laboriously-crafted lesson plans and impromptu teachable moments as well.
A new model

This new model will require a shift in focus from the current collective view of digital instructional interventions, such as our large learning management systems and the current crop of MOOCs.
An educational commitment.
A cultural imperative.
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