Accessible, inclusive M-learning: using the iPad as a case study

Lecture

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ACCESSIBLE, INCLUSIVE M-LEARNING: USING THE IPAD AS A CASE STUDY

Outline of the presentation

- The SAMR Model of technology
- Understanding how mobile learning can be adapted to working with students with disabilities
- What is inclusion in education
- Inclusive and accessible technology
- The iPad as a case study of inclusion in technology
  - What they promise
- Settings on the iPad for disabled students
- Forms of disability and the iPad:
  - Physical disability
  - Sensory disability
  - Learning Disability

Classifying learning technologies

THE SAMR & M- LEARNING MODELS

	Transformation	
Redefinition	Technology allowing for the transition of training in new tasks through AT/IT	Teaching students how to use their tablet computers, their operating systems, etc.
Modification	Technology allows for significant redesign of tasks	The inclusion of email functions within word processors, the integration of mail merge or hyper text editing within word processors
Augmentation	Technology substitutes as a direct tool, with functional improvements	Cut and paste functions, waste bin functions, spell checking functions, grammar checking functions within word-processing
Substitution	Technology acts as a direct tool substitute, with no functional change	The use of a word processor instead of a typewriter, or hot metal publishing peocessing
	Enhancement	

What is Mobile Learning (m-learning)?

- m-learning is pedagogy employed in education with mobile devices
- iPads are noteworthy devices for use in m-learning
  - they are designed for multiple communication channels, multi-media and quick access to apps
- There are evaluations of m-learning using iPads and similar tablets with varying degrees of success

Adapting technology to special needs

WHAT ARE SPECIAL NEEDS / DISABILITIES IN EDUCATION?

Definition of disability

"The term persons with disabilities is used to apply to all persons with disabilities including those who have long-term physical, mental, intellectual or sensory impairments which, in interaction with various attitudinal and environmental barriers, hinders their full and effective participation in society on an equal basis with others… Disability resides in the society not in the person."

(United Nations, 2007)

Traditional Approaches to this Problem

- Changes to:
  - lessons and teaching strategies
  - teaching subjects
  - the educational environment
  - skill sets of teaching
  - the assessment of teaching
  - technologies of education
    - Technology becomes a subset of traditional teaching strategies

What is Accessible / Assistive Technology?

"Assistive technology is defined as any item, piece of equipment, or system, whether acquired commercially, modified, or customized, that is commonly used to increase, maintain, or improve functional capabilities of individuals with disabilities."

(Architectural and Transportation Barriers Compliance Board, 2000 :P. 80504)

Assistive Technology

The Problems with Assistive Technology

- Existing assistive technology is highly immobile, clunky and restrictive
- It is expensive and uneconomic in mainstream classes
- Assistive devices often identify a person as having a special need and can be stigmatising
- There is little research on m-learning and its use with assistive / inclusive devices
  - those that exist mostly cover all needs
- This provides a problem in research, and highlights an area in need of evaluation

What is Inclusion?

- The notion that students should not have a separate form of education
- The philosophy that students have social and cultural equality with mainstream students
- That special needs and disability should not signify inferiority, particularly of intelligence
- That students with special needs had valuable human capital that could be valuable to societies
- Technology is behind pedagogy and other forms of institutions in integrating inclusion

What is Inclusive Technology?

"Inclusive technology is defined as a mainstream technology that can be used with either no or minimal adaption by a person with a disability as an accessible technology. It is also seen as technology that provides social inclusion, such as communication and interaction, for people with disabilities"
(Hayhoe, 2013)

Tablet Computer Accessibility

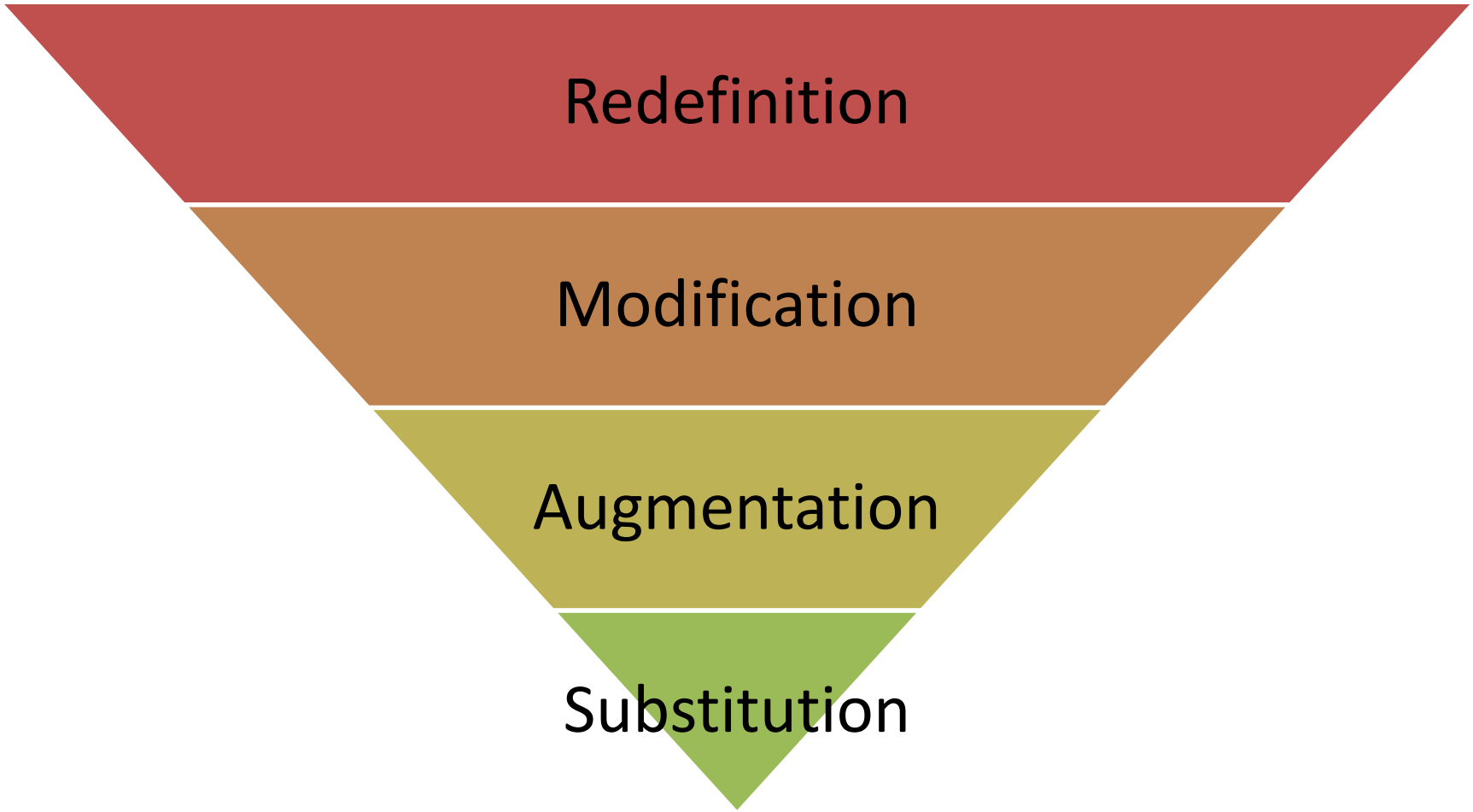
Blindness

ASL app. Apple.com ©

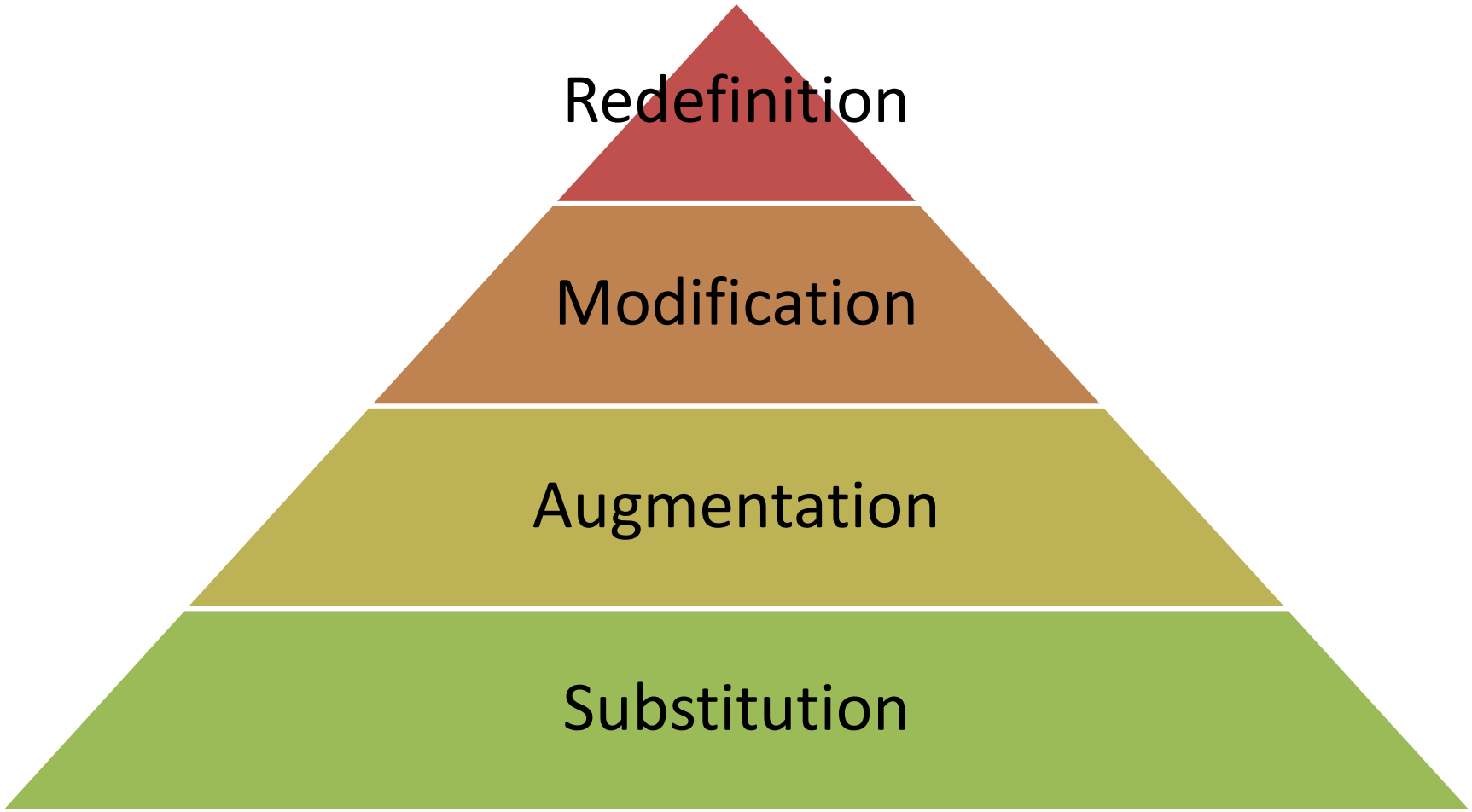
Deafness

	Transformation		
Redefinition	Technology allowing for the transition of training in new tasks through AT/IT	Customised technology that allows teachers and students mobility, writing facilities, reading facilities, hearing facilities	*Traditional* assistive technology
Modification	Technology allows for significant redesign of tasks	Technology used in conjunction with normal learning technologies	
Augmentation	Technology substitutes as a direct tool, with functional improvements	Accessible settings, such as enhanced zoom functions, voice recognition, differing gestures and alternative input and output peripherals	Inclusive technology
Substitution	Technology acts as a direct tool substitute, with no functional change	Tablet computers, smart phones, mp3 players and multi media devices with differing inputs and outputs	
	Enhancement		

Traditional Model of Assistive and Inclusive Technology



The Ideal Future



Technology as Facilitator

- A move away from the traditional notion of teaching students in different settings
- The notion that technology is not just a tool of inclusion
- Technology can be used to drive inclusion
- A move away from technology merely assisting people
- The notion that inclusion can be driven by technology

Developing useful tablet technology for disabled students

THE IPAD AS A CASE STUDY OF INCLUSIVE TECHNOLOGY

Apple expresses its commitment to accessibility

- Apple states a specific commitment to accessibility that fits a definition of inclusive technology:

"Apple includes assistive technology features in its products as standard features – at no additional cost"

- This statement has been supported by articles from the trade press

Settings Panel. Apple.com ©

Apple and special educational needs

- Apple's accessibility adheres to the US Government's General Services Administration, US Access Board, Web Accessibility Initiative, and National Federation of the Blind
- Apple's approach to its features for use in special education are broken into the following four categories:
  - Literacy and learning
  - Vision
  - Hearing
  - Physical and motor skills

Royal Association for Disability Rights app. Apple.com ©

Different disabilities and settings

DIFFERENT SETTINGS FOR PARTICULAR DISABILITIES

BV	DH	PM	L&L	Feature	Function	Mac OS X	iOS
•		•	•	VoiceOver	Provides access to the Mac, iPhone, iPad, and iPod touch, and iTunes through speech, audible cues, and keyboard and gesture-based trackpad navigation; supports multiple languages.[4]	•	•
•				Braille	Supports contracted and uncontracted Braille. On a Mac, delivers plug-and-play Braille display support for more than 40 USB and wireless models, a Braille font, and onscreen Braille/English translation. Braille mirroring allows multiple USB braille displays to connect to one computer simultaneously. On iPhone, iPad, or iPod touch, delivers plug-and-play braille display support for over 30 wireless models.[4]	•	•
•			•	Multiple language support for VoiceOver	Works in over 20 languages on a Mac and over 30 languages on iPhone, iPad, and iPod touch.	•	•
•	•	•	•	Zoom	Magnifies screen by up to 40x on a Mac and 5x on an iPhone, iPad, or iPod touch.	•	•
•		•	•	Text to Speech	Speaks highlighted text as well as text in dialogs and alert messages.	•	
•		•	•	Voice Recognition	Operate elements of the Mac, iPhone, or iPod touch with spoken commands.	•	•
•			•	View and Magnification	Increase icon, text, and cursor size, and magnify items in the Dock.	•	
•			•	Display Adjustment	Adjust display to enhance readability (grayscale, monochrome, or high-contrast video display). Control text and icon size in the Finder in Mac OS X and in Mail, Contacts, and Calendars in iOS.	•	•
•			•	Keyboard Navigation	Manipulate the user interface using only the keyboard, and create keyboard shortcuts.	•	
•	•	•	•	Mac OS X built-in text editing	Use powerful systemwide text tools in Mac OS X, such as Dictionary, Spell Check, Word Completion, Summarize, and "Add to iTunes as a Spoken Track."	•	
		•		Sticky Keys	Press a set of modifier keys as a sequence rather than all at once.	•	
		•		Mouse Keys	Perform mouse functions with the numerical keypad.	•	
		•		Slow Keys	Creates a delay between when a key is pressed and when it's accepted, accommodating users who frequently press wrong keys accidentally.	•	
	•		•	Flash Screen	Flashing screen indicates an alert sound.	•	
	•		•	QuickTime Text Track	Enables text access to audio in video or audio-only content.	•	•
•	•	•	•	Multiple users	Computer can retain preferred accessibility settings for each student.	•	
•		•	•	Keyboard Viewer	View and use the keyboard on the computer screen.	•	
•		•	•	Talking clock and calculator	Announces the time on the hour, half hour, or quarter hour. Also announces each button clicked on the calculator and the results of calculations.	•	
•	•	•	•	Automator	Creates workflows easily to automate repetitive tasks.	•	

BV= Blind and low vision DH = Deaf and hard of hearing PM = Physical & motor disabilities L&L = Literacy & learning challenges

The iPad

- The iPad 2 has a number of inclusive features
  - voice function to identify objects
  - text on screen for people with hearing impairments
  - help with learning disabilities
  - a zoom facility for users with low vision
  - a function for changing colour to photo-negative
    - also on the iPhone 2 and iPods
    - only a singly study so far with one case study of blindness in an Emirati context

The future of iPad inclusivity

SUMMARY OF THE IPAD AND INCLUSION

- The iPad makes its claim to be a superior accessible technology
- There is some evidence that it can help students with the disabilities it has developed settings for
- It should be recognised an an inclusive as a technology for:
  - Its styling, and the social acceptability of its use in comparison to traditional, highly identifiable assistive technologies
  - Its cost in comparison to traditional technologies
  - The range of accessible features it has as standard
  - Its apparent ease of use

- However, some elements need improving:
  - Costs in comparison to other mainstream tablets
  - The amount of processing time that it takes to use accessible settings
- It is too early to say whether it significantly improves the prospects of students with disabilities in the GCC
- Much more research is needed in this context