Ubiquitous Technology for College Success: Apps+

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Road Map
1. Increased use of mobile app technologies in college
2. Use of Universal Design for Instruction© to evaluate apps
   • Note-Taking
   • Writing
   • Reading
3. Concluding thoughts

State of the ‘Apposphere’
- Apps: self-contained, specialized, mobile software applications
- Over 850,000 mobile apps available; 50,000 apps for education (Apple.com; Google.com)
- 56 billion smartphone apps and 14 billion tablet apps will be downloaded in 2013 (Flurry, 2013)
- 1.2 billion mobile app users worldwide in 2012, 18% of these users live in North America; expected to reach 4.4 billion in 2017 (Portio Research, 2013)

Apps are Ubiquitous and Mainstream
- Technology is no longer simply assistive or compensatory for students with disabilities, but is redefining learning goals and teaching methods (Rose & Meyer, 2000)
- Read, write, or learn in any environment
- Movement away from “deficits model” towards inclusive learning environments (Gregg & Banerjee, 2008)

How to Select Apps?
- Overwhelming number of choices
- No single yardstick or gold standard for evaluation
- Apps should be evaluated on their ability to address individual needs at multiple levels (Cheeseman, 2012)

Universal Design for Instruction (UDI)
“An approach to teaching that consists of the proactive design and use of inclusive instructional strategies that benefit a broad range of learners including students with disabilities.” (Scott, McGuire, & Embry, 2002)

- Equitable use
- Flexibility in use
- Simple and intuitive
- Perceptible information
- Tolerance for error
- Low physical effort
- Size and space for approach and use
- Community of learners
- Instructional climate
How to Select Apps?
Adapted from Banerjee, Brinckerhoff, Prasad, 2013

- **Accessibility**: is the degree to which an app makes course content obtainable to diverse learners.
- **Usability**: is the degree to which an app can be easily navigated and operated.
- **Effectiveness**: is the degree to which the features of an app can support a skill and produce a selected outcome.

Source: [http://www.udi.uconn.edu](http://www.udi.uconn.edu)

### Customizable Evaluation Matrix

<table>
<thead>
<tr>
<th>Necessary Features</th>
<th>Desired Features</th>
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<tr>
<td>Accessibility</td>
<td>Audio recording that syncs with text and photos</td>
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<td>Usability</td>
<td>Effective user guides, demo or video tutorial</td>
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<td>Automatically syncs with cloud and multiple hand-held tablet devices</td>
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### Note-taking Apps

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### Note-taking Apps

- **Accessibility**
  - Access to handwriting tools, typing, audio recording, camera recording and annotations
  - Highlighting of text and images
  - Zoom-in feature
  - Accessible on internet via Cloud storage (Dropbox, Google)

- **Usability**
  - Effective user guides, demo or video tutorial
  - Ease of recording and playback
  - Intuitive, attractive design
  - Flexible organization into Notebooks

- **Effectiveness**
  - Annotation tools for note revision and organization
  - Word search

### Apps Review Sites

- [http://www.edutopia.org](http://www.edutopia.org)
- [http://www.iear.org/](http://www.iear.org/)
- [http://www.edudemic.com](http://www.edudemic.com)
- [http://teacherswithapps.com/](http://teacherswithapps.com/)
- [http://educationappreviews.com/Education_App_Reviews.html](http://educationappreviews.com/Education_App_Reviews.html)
Cognitive Load

Piolat, Olive, & Kellogg (2005)

Maximizing Cognitive Working Space
- Eliminate unnecessary cognitive loads
- Support or simplify difficult cognitive tasks
- Break up complex cognitive tasks
- Maximize student motivation and engagement

Survey of College Students with LD, ADHD, and ASD and Apps Use

- Small pilot study (n=62) in fall 2013 - spring 2014
- Online student survey
- Selected Findings:
  - 88.9% said they use smartphone for schoolwork
  - Apps for note-taking (12 different apps were mentioned)
  - App feature most useful for note-taking – audio recording that synchs with text
  - 66% said they use apps for writing; most useful feature was voice recognition; improved legibility; cloud storage so you don’t lose or forget work
  - Most useful feature for reading apps – variety of voices and options for font and color (71.4%)

Empowering Students

Learning strategies to manage tasks
Empowers students to develop critical thinking skills

Apps for Academic Skills

- **Note-taking**: Recording and organizing information from a course; planning for studying
- **Writing**: Organizing thoughts, ideas, notes and resources into an outline and then into a draft
- **Reading**: decoding text; understanding vocabulary; annotating text; creating study guides and summaries

Guiding question for students:
What do you struggle with primarily in each of these areas?

Why Take Notes:

- Develops active listening
- Help clarify confusions
- Improves long-term information storage
- Results in better test grades
What Does Research Say?

• Computer-aided transcription supports working memory, better notes, better recall (Bui, Myerson, & Hale, 2013)

• Converting to a visual format improves comprehension and recall (Weishar & Boyle, 1999; Makany, Kemp & Dror, 2009)

• Deeper processing supports better recall (Hyde & Jenkins, 1973; Cermak & Craik, 1979)
Organizing Notes from Notability

- Pull out main ideas
- Highlight key points and important vocabulary
- Identify and fill-in gaps in your notes
- Work with a partner if you are taking physical notes
- Reference the audio recording if available
Thought Organization Apps

Writing and Reading: cognitive load

Scaffolds and Supports
- Task analysis: raise awareness of the time and the multiple steps it takes to complete a task
- Individualized Process: strategic step-by-step plan
- Graphic organizers: scaffold challenging tasks, helps organize assignments, manage and breakdown overwhelming schedules

Distractions
Cognitive Work
Space

Writing a paper

An Example of a Writing Task

Best practice: Concept Maps
Inspiration Diagram

Inspiration Outline

Inspiration Brainstorming

Reading Apps

Executive Function Coordinates

Simultaneous Sub-Processes

Reading Speed and Fluency

Reading Comprehension

Shallow vs. Deep Processing

<table>
<thead>
<tr>
<th>Shallow</th>
<th>Deep</th>
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<tbody>
<tr>
<td>Rote rehearsal</td>
<td>Elaborative rehearsal</td>
</tr>
<tr>
<td>Repeat</td>
<td>Meaningful associations</td>
</tr>
<tr>
<td>Reread</td>
<td>Critical analysis of distinctive features</td>
</tr>
<tr>
<td>Focus on superficial aspects</td>
<td>Analysis of organization</td>
</tr>
<tr>
<td>Spelling</td>
<td>Personalized connections</td>
</tr>
<tr>
<td>Listings</td>
<td>Practice appropriate retrieval (emulate testing formats)</td>
</tr>
<tr>
<td>Factual detail</td>
<td>Overlearning</td>
</tr>
<tr>
<td></td>
<td>Automaticity</td>
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www.samford.edu/how-to-study/
Active Reading

• Breaks down comprehension into manageable, predictable steps

• Scaffolds gaps created by problems in attention, memory, and language comprehension

• Integrates comprehension with writing about texts (summarizing)

Active Reading Steps

1. Preread
2. Read and Highlight
3. Paraphrase and margin note
4. Chunk by topic
5. Summarize

Step 2. Read and Highlight

Apps that support active reading

Reading Apps

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<tr>
<td>Accessibility</td>
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</tr>
<tr>
<td>• Text-to-Speech; Variety of different voices</td>
<td>• Integrate with Cloud storage, Voiceover and Bookshare</td>
</tr>
<tr>
<td>• Customizable reading rate</td>
<td>• OpenDyslexia font</td>
</tr>
<tr>
<td>• Customizable font and font size, text and font color, highlight colors</td>
<td>• Focused reading mode (masks page)</td>
</tr>
<tr>
<td>• Reads large variety of text documents (e.g. Word, PowerPoint), web, PDFs off-line</td>
<td>• Reads mathematical notations</td>
</tr>
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<td>• Customizable pronunciation dictionary</td>
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<tr>
<td>• Clear user guides</td>
<td>• Book-like paging alternative to scrolling</td>
</tr>
<tr>
<td>• Smooth play, pause, rewind/fast forward</td>
<td>• Continues reading when exit the app or lock the screen</td>
</tr>
<tr>
<td>• Synchronized highlighting of word, sentence being read</td>
<td>• Remembers where user stopped reading</td>
</tr>
<tr>
<td>• Remembers where user stopped reading</td>
<td>• Listens to web pages or reading lists</td>
</tr>
<tr>
<td>• Fully searchable</td>
<td>• Built-in dictionary</td>
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<td>• Text-to-speech option motivates decoding; extracts text from several sources</td>
<td>• Focused Reading Mode to help with focusing attention</td>
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<tr>
<td>• Focused Reading motivates decoding;</td>
<td>• Simple navigation through text by sentence, paragraph, page, and chapter</td>
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<td>• 15, 30, 60 seconds supports working memory</td>
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### Exemplar app: iBooks

- Large selection of trade books and texts
- Full color, interactive features
- Most extensive annotation tools
- Exportable highlights and notes

### Similar apps

- Kindle
- Adobe Reader – annotating/editing PDF’s
- Voice Dream Reader – when you need built-in text to speech

### Annotation Process

- Personalize reading experience
- Annotate
- Review Annotations
- Export Annotations

### Emailed Notes

### iBooks Text Books: special features

- Glossary = study cards
- HL automatically convert to note cards
- Note cards can be emailed
Ubiquitous Technology: Apps  CUNY Access  Linda Hecker  5/1/2015

**iBooks Texts: Study Cards**

- **ADOBE READER**
  - Reads PDF’s
  - Annotates
    - Multi color highlighting
    - Underline
    - Sticky notes
    - Text notes
  - Exports notes
  - Converts to Word/excel (monthly fee)

Adobe Reader: emailing annotated PDF

**VOICE DREAM READER**
Voice Dream Reader

- Full functioned text-to-speech
- Variety of voices
- Limited annotation tools
- Exportable notes and highlights

Tips to Support Success

- Start simple
- Practice daily
- Stick with it
- Daily appointments with self
- Check off completed work
- Track completed and pending assignments

Concluding Thoughts

- Current approach towards finding appropriate educational apps is “hit or miss”
- Input from actual users in authentic and varied situations is critical
- Continue to use assistive technologies for access, but consider apps to increase efficiencies in learning and reduce cognitive load
- Identify a core set of apps – frequent use