

## LEGISLATIVE REPORT

**SUBJECT:** Requesting the Hawaii Department of Education (DOE) to Conduct a Feasibility Study on Converting Hardcover Textbooks to eBooks for Use in Public Schools

**REFERENCE:** SCR 030, HD1 (2009)

**ACTION REQUESTED:** Study to include a review of accessibility features for students who are blind or visually impaired. Report findings and recommendations including cost estimates.

### **DOE REPORT:**

#### **Introduction:**

In an effort to support Hawaii public school students, the Hawaii DOE conducted a feasibility study on the availability, use, progress, and costs of incorporating electronic textbooks in K-12 schools. This study provides information addressing concerns regarding textbook shortages, weight of the textbooks, high purchase costs, and currency of information. This study presents data and evidence of research to show the effectiveness of electronic textbooks (including open textbooks, eBooks, digital textbooks and audio books), accessibility for blind or visually impaired, probable cost savings, and legislation currently considered by states moving to adopt this media.

#### **FINDINGS:**

##### **Types of electronic textbooks:**

- Open textbooks  
Freely available electronic textbooks with non-restrictive licenses. Available to download, print in various file formats from several websites and Open Education Resources (OER).
- eBooks  
Electronic version which can be read on personal computers, smart phones, or dedicated hardware devices known as eBook readers or eBook devices (e.g. Kindle, Sony Readers, Mobipocket Desktop, eBook Reader).
- Digital Textbooks  
Electronic versions of traditional print textbooks.  
Digital textbooks often provide additional audio and video resources to help the reader assimilate the information contained in the text.
- Audio Books  
Audio recording of a book or textbook.

##### **Positive Characteristics of electronic textbooks:**

- Compact - One reading device/laptop able to contain many textbooks.
- Portable - Weigh less than traditional books and easily transportable.

- Current - Information can change quickly with a download.
- Differentiated - Offers alternative resources. Supports visually and/or auditory impaired students.
- Customized - Can often be purchased as individual chapters or a complete text.
- Flexible - Can be combined with other digital materials, such as portions of other textbooks, periodical articles, instructor-provided materials, etc.
- Enhanced - May feature learning tools content such as hyperlinks to related learning modules, electronic annotation by students, keyword searches, additional graphics, dictionaries and/or pop-up modules that furnish additional information.

### **Challenges of electronic textbooks:**

- Print versions may cost less than electronic versions.
  - Some cost incurred using electronic versions include: subscription, software, download fees, ink and paper to print electronic versions is equal or greater than hardcover text.
- Electronic versions may be deleted after a period of time/subscription.
  - Publisher has full control and ownership of the material.
  - Material may be changed or eliminated at publisher's discretion.
- Electronic readers only read specific types of material.
  - In the initial stages of development, developers of eReaders are proprietary.
- No common digital format.
  - Material format is not cross platform (interchangeable).
- Inequity on equipment availability.
  - Schools with limited funding will not be able to afford the equipment necessary for eTextbooks, readers, and computers.
- Teacher training.
  - Training incurs additional cost and time away from students.
- Policies regarding replacement costs involved with damage or loss of equipment.
  - Systems will have to be developed to determine policies statewide or school wide.
- Funding.
  - State legislation will be required to secure funding for implementation and maintenance of this effort.

### **Other considerations:**

- Governance.  
Legislation to appropriate funding to implement electronic textbooks.
- Blind or Visually Impaired.  
Enlargement and audio capabilities are available to assist visually impaired students.
  - Some of the electronic readers (e.g., Kindle and Sony Reader) have enlargement and audio capabilities that may be controlled by the reader.
  - Curricular resources are not readily available; most are at college level.

- Assistive technology screen readers and voice recognition products are available to provide accessibility utilizing computers for those with significant vision, hearing, dexterity, language, or learning needs.

Schools in several states have begun the transition to electronic textbooks with varying degrees of success. The chart below identifies key findings on the use and progress of electronic textbooks in their curriculum.

**State /Schools Transitioning into electronic textbooks:**

U.S. Schools	Key findings
<b>CALIFORNIA STATE</b>	<ul style="list-style-type: none"> <li>• California Open Source Textbook Project (COSTP) provides new model for textbook creation by leveraging free educational content in public domain, leveraging substantial curriculum-based materials by California teachers, using innovative copyright tools to secure new and dormant K-12 textbook content.</li> <li>• COSTP mandates that it does not replace printed textbooks. It is looking at making them less expensive to produce.</li> <li>• Collaborative, public/private undertaking.               <ul style="list-style-type: none"> <li>○ Phase 1: Self-supporting within 18 months of start-up, save California upwards of \$200M + per year for K-12 textbook allocation within five years.</li> <li>○ Phase 2: In year six, offer by license and normal cost K-12 textbook and curriculum materials to other educational organizations and international agencies. Cost savings to other agencies and profit to California.</li> </ul> </li> <li>• Lack of Funding.</li> </ul>
<b>ILLINOIS STATE</b> Batavia High School	<ul style="list-style-type: none"> <li>• Started with seven Rocket eBooks in 2000 – students lost interest.</li> <li>• As of March 2009, Kindles were purchased through a grant.</li> </ul>
<b>FLORIDA STATE</b> Florida Public School	<ul style="list-style-type: none"> <li>• Higher assignment completion rates.</li> <li>• Seamless transition between electronic textbooks and its applications.</li> <li>• Longer periods of engagement with curricular content.</li> </ul>
<b>FLORIDA STATE</b> Lake Weir High School, Marion County Public Schools	<ul style="list-style-type: none"> <li>• Part of Marion County's three-year technology plan to provide wireless network access to all secondary schools.</li> <li>• Once wireless was installed, students could use laptops for a variety of projects.</li> <li>• Saunders County's (Lake Weir) nine-week pilot program officially began in March. Allowed freshman students in English class to use laptops to access information and use digital texts.</li> <li>• The district used funds normally allocated for textbooks and instead purchased laptops with digital versions of the texts loaded on the hard drives.</li> </ul>

	<ul style="list-style-type: none"> <li>• Students used the laptops everyday in English class. Students allowed to take laptops home to complete homework and group projects.</li> </ul>
<b>UTAH STATE</b> Seattle and Utah Schools	<ul style="list-style-type: none"> <li>• Schools are developing full, course-long computer based textbooks.</li> <li>• This will allow students to interact with material.</li> <li>• Students can work at their own speed.</li> <li>• Homework is automated, saves hours of grading time.</li> </ul>
<b>ARIZONA STATE</b> Empire High School	<ul style="list-style-type: none"> <li>• Students use computers provided by the school to get their lessons, do their homework and hear podcasts of their teachers' science lectures.</li> <li>• <a href="http://www.nytimes.com/2009/08/09/education/09textbook.html">http://www.nytimes.com/2009/08/09/education/09textbook.html</a></li> </ul>
<b>ARIZONA STATE</b> Cienega High School	<ul style="list-style-type: none"> <li>• Students who own laptops can register for "digital sections" of several English, History and Science classes</li> <li>• <a href="http://www.nytimes.com/2009/08/09/education/09textbook.html">http://www.nytimes.com/2009/08/09/education/09textbook.html</a></li> </ul>

Publishers of textbooks, recognizing the technology trends, have diversified their products to offer schools alternatives such as audio books, digital textbooks and eBooks.

**Sampling of Publishers:**

	Equipment Needed	Print Textbooks	Open Texts	eTextbook	Chapters	Downloadable	Subscription	E-book	Other
Approximate Cost	\$80-\$2000 Reader Computer	\$175.00	Free	\$96.00 \$181.49	\$8.99			\$80.00	
Pearson		\$60.70							
Houghton Mifflin		\$9.45-\$58.20		In Development					
McGraw-Hill		\$58.80				\$74.57 180 Days	X		Suits for Copyright Infringement-case Pending
iChapters	Computer \$1000-\$2000	\$144.49		\$181.49 6 Months	\$8.99	X	X		College Level
Digitaltext-books.com	Computer \$1000-\$2000					\$48.76 180 Days			Digital Text-books High School, College
Vital Source BookShelf	Computer \$1000-\$2000			\$96.00	\$8.00	\$96.00	X		Higher Education
Random House						\$22.48			Literature
Barnes & Noble	eReaders \$299					Free-\$9.99	X		Literature
Amazon	Kindle \$299						X		
Google							X		In Litigation for Copyright Infringement
RFB&D-Recording for Blind & Dyslexic	Audio Player \$250-\$350					Free	\$350/Year Allow 25 Books Per Year		National Nonprofit, Visual, Impairment & Dyslexia

**Legislative Trend:**

Kentucky Textbook Accessibility Act SB 423	<ul style="list-style-type: none"> <li>Requires publishers of K-12 textbooks or programs to provide same materials in accessible electronic format.</li> </ul>
Instructional Materials Accessibility ACT of 2002 (IMMAA)	<ul style="list-style-type: none"> <li>Mandates publishers to submit an electronic file of all instructional textbooks.</li> <li>Defines specific technical parameters.</li> <li>Requires consistency with technologies used to produce special formats (Braille).</li> </ul>

**Feasibility of transitioning from printed textbooks to electronic textbooks and/or material.**

According to the Hawaii DOE \*Textbook Expenditures SY2008-09, Hawaii Public Schools spent \$9,217,964.00 on textbooks (general textbook life - 5 years.)

Scenario: If a school of 500 students considered transitioning from printed textbooks to electronic textbooks, their anticipated budget might look like the following:

Material	Life Span	Cost Per Item	Cost for 500 Student
Printed Textbook	5 Years	\$175.00	\$87,500.00
Digital Readers	Battery Life Two-Weeks	\$300.00	\$150,000.00
Downloadable Files	Updates	Free- \$3.99 Per Chapter	Will Vary

**\*Hawaii DOE Textbook Expenditures SY 2008-09**

FUND	Data	TEXTBOOKS
Federal	Sum of Exp + Enc	759,674.25
	Sum of CARRY	(6,301.49)
Special	Sum of Exp + Enc	226,753.45
	Sum of CARRY	(2,442.55)
Trust	Sum of Exp + Enc	795,255.80
	Sum of CARRY	(18,358.96)
ARRA	Sum of Exp + Enc	102,534.63
	Sum of CARRY	-
General	Sum of Exp + Enc	6,720,537.65
	Sum of CARRY	640,311.30
Total Sum of Exp + Enc	Sum of Exp + Enc	<b>8,604,755.78</b>
Total Sum of CARRY		<b>613,208.39</b>
<b>TOTAL</b>		<b>9,217,964.00</b>

## **CONCLUSION:**

Digital textbooks have the potential to provide a wealth of material, at a lower cost, and are physically lighter for transporting. However, there are a multitude of issues that need to be resolved before implementation can take place.

- Resources - Publishers are currently producing material geared for college and university levels. The K-12 material is not readily available for purchase or subscription.
- Rights management and copyright issues are being investigated and challenged.
  - See Page 5 Graph.
- Hardware - Schools must have appropriate hardware in sufficient quantity for their students to utilize digital textbooks in their curriculum.
- Training - Teachers need to be trained on the use of the devices, software, and/or resources.
- Formats - Presently, eReaders read specific formats that may not be transferable (e.g. the Kindle recognizes only Kindle material).
- Software for visually impaired available for recreational reading but curricular material is not incorporated into eReaders.
- Funding.
  - State Legislation will be required to secure funding for implementation and maintenance of this effort.

## **RECOMMENDATION:**

Education and publication are in the initial stages of digitized textbook transformation. As with many new technologies, the initial stages are costly, and limited. As the industry gains momentum, the resources may become more readily available and more affordable with mass production. Presently, the research suggests continuing the investigation to track the progress of digital textbook resources, their availability, and related issues that are currently challenging the transition.

Assistive technologies provide access for the blind or visually impaired. They are served better with oversized books, Braille or audio books. There are organizations, such as the Braille Institute of America and Reading or Blind & Dyslexic, Inc., that support and provide materials for this community.

The Hawaii DOE does not recommend the transition of hard cover textbooks into digital textbooks due to the following: lack of National or Hawaii Standards-Based content material available; copyright issues between publishers and distributors; majority of the digital textbooks are presently geared for college level; and start up costs for schools are prohibitive. The Hawaii DOE is recommending collaboration between content area and information specialists to track the development of digital textbooks and provide recommendation to adopt this effort when quality content and actual cost savings become evident.

## RESOURCES:

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