Open Educational Resources, Open Education, and Online Learning:

Revolution, Evolution, or Just One More Fad?

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Office of Scholarly Communications  
University Libraries
Connecting the Dots: 
Open Access, Open Ed and an Open Future

Nicole Allen (nicole@sparc.arl.org)
Director of Open Education, SPARC

#OpenUBC | Vancouver | Oct. 28, 2014
STATUS QUO
Percentage of first-time, full-time undergraduate students in degree-granting institutions receiving any financial aid, by level and control of institution: Academic years 2006–07 through 2011–12

Source: U.S. Department of Education
http://nces.ed.gov/fastfacts/display.asp?id=31
course materials may also be limited given their uniqueness to a particular course on a particular campus.

In 2005, based on data from the Bureau of Labor Statistics, we reported that new college textbook prices had risen at twice the rate of annual inflation over the course of nearly two decades, increasing at an average of 6 percent per year and following close behind increases in tuition and fees.

Figure 1: Estimated Increases in New College Textbook Prices, College Tuition and Fees, and Overall Consumer Price Inflation, 2002 to 2012

More recent data show that textbook prices continued to rise from 2002 to 2012 at an average of 6 percent per year, while tuition and fees increased at an average of 7 percent and overall prices increased at an average of 2 percent per year. As reflected in figure 1 below, new textbook prices increased by a total of 82 percent over this time period, while tuition and fees increased by 89 percent and overall consumer prices grew by 28 percent.

Source: Bureau of Labor Statistics’ Consumer Price Index data

$1,207

Average U.S. student budget for books and supplies for the 2013-2014 academic year

### Traditional Textbook Prices

<table>
<thead>
<tr>
<th>Textbook</th>
<th>New</th>
<th>Used</th>
<th>Rental</th>
<th>E-Book</th>
<th>E-Reader</th>
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</thead>
<tbody>
<tr>
<td>Principles of Economics</td>
<td>$206.12</td>
<td>$154.59</td>
<td>$73.42</td>
<td>$101.59</td>
<td>$116.25</td>
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<tr>
<td>Financial Accounting</td>
<td>$206.38</td>
<td>$154.79</td>
<td>$78.81</td>
<td>$101.30</td>
<td>$120.51</td>
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<tr>
<td>Business Communication</td>
<td>$156.20</td>
<td>$117.15</td>
<td>$59.56</td>
<td>$71.81</td>
<td>$93.08</td>
</tr>
<tr>
<td>Principles of Marketing</td>
<td>$150.05</td>
<td>$112.54</td>
<td>$62.71</td>
<td>$75.95</td>
<td>$91.00</td>
</tr>
<tr>
<td>Information Systems</td>
<td>$155.57</td>
<td>$116.67</td>
<td>$67.33</td>
<td>$77.58</td>
<td>$109.08</td>
</tr>
<tr>
<td>Linear Algebra</td>
<td>$159.02</td>
<td>$119.27</td>
<td>$58.31</td>
<td>$47.94</td>
<td>$102.80</td>
</tr>
<tr>
<td>Statistics</td>
<td>$151.37</td>
<td>$113.52</td>
<td>$62.23</td>
<td>$74.81</td>
<td>$114.73</td>
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<tr>
<td>Calculus</td>
<td>$209.45</td>
<td>$157.09</td>
<td>$74.92</td>
<td>$110.08</td>
<td>$119.32</td>
</tr>
<tr>
<td>College Algebra</td>
<td>$162.47</td>
<td>$121.85</td>
<td>$63.84</td>
<td>$82.78</td>
<td>$100.54</td>
</tr>
<tr>
<td>Physics</td>
<td>$198.17</td>
<td>$148.63</td>
<td>$77.47</td>
<td>$91.45</td>
<td>$108.60</td>
</tr>
<tr>
<td><strong>Average</strong></td>
<td>$175.48</td>
<td>$131.61</td>
<td>$67.86</td>
<td>$83.53</td>
<td>$107.59</td>
</tr>
<tr>
<td><strong>Savings off new price</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>25.00%</td>
<td>61.33%</td>
<td>52.40%</td>
<td>38.69%</td>
<td></td>
</tr>
</tbody>
</table>

• Source http://www.studentpirgs.org/sites/student/files/reports/A-Cover-To-Cover-Solution_4.pdf
PKG 2 PC CALCULUS EARLY TRANSCENDENTALS 7TH ED + SOLUTIONS MANUAL SINGLE VARIABLE

Author: STEWART
ISBN: 9781111978532
Publisher: Thomson Nelson Learning
Edition: 7
Copyright: 11

Allow Substitutions: Yes
Options: NEW $180.20
Quantity: 1

Add to Cart  Add to Wish List
Options: NEW - $180.20
by James Stewart (Author)
Be the first to review this item

Buy New
Price: $208.17  |  Prime
1 Used from $130.96

Amazon Price  New  Used  
$208.17  $208.17  $130.96

Other formats, January 1, 2011

Bundle: Calculus: Early Transcendentals, 7th Edition
Buy new: $195.13
91 Used & new from $103.02

Student Solutions Manual, (Chapters 1-11) for Stewart's Single Variab...
Buy new: $88.24
108 Used & new from $14.95

Calculus: Early Transcendentals
Buy new: $233.03
118 Used & new from $88.44

www.sparc.arl.org
Rental Options  Expiration Date

- Unlimited       Apr 20, 2016   $201.49
- 540 days        Oct 23, 2015   $107.99
- 360 days        Apr 26, 2015   $86.49

180 days

DONE READING?

GOOD

2 in 3

Students say they decided against buying a textbook because the cost is too high

Source http://www.uspirg.org/reports/usp/fixing-broken-textbook-market
1 in 2

Students say they have at some point taken fewer courses due to the cost of textbooks

Students can’t learn from materials they can’t afford
“Market Failure”

Resulting Issue: Access to college
We can do better.
How do we enable everything that today’s technology makes possible?
Discussion:

Is your campus concerned about the costs of higher education?
OPEN EDUCATIONAL RESOURCES
1. Free
   (no cost, no barriers)

2. Open
   (right to fully use)
Teaching, learning and research resources that reside in the public domain or are released under an intellectual property license that permits their free use and repurposing by others”

Hewlett Foundation
Open Licensing

Uses copyright to enable free sharing and reuse
(easy-to-use open licenses)
www.creativecommons.org
most open

least open

• Adapted from slides by Cable Green available under CCBY at http://www.slideshare.com/cgreen
The “5R” Permissions

<table>
<thead>
<tr>
<th>Permission</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Retain</td>
<td>Make and own copies</td>
</tr>
<tr>
<td>Reuse</td>
<td>Use in a wide range of ways</td>
</tr>
<tr>
<td>Revise</td>
<td>Adapt, modify, and improve</td>
</tr>
<tr>
<td>Remix</td>
<td>Combine two or more</td>
</tr>
<tr>
<td>Redistribute</td>
<td>Share with others</td>
</tr>
</tbody>
</table>

- Adapted from slides by David Wiley, available under CC BY. See [www.opencontent.org](http://www.opencontent.org) for full 5R definition.
Potential Educational Impacts

1. Improve access to higher education by addressing costs
2. Improve student learning
3. Increase student enrollment
4. Improved retention & graduation rates
HOW IT WORKS
Three Paths to OER

1. Adoption
2. Adaption
3. Create

Texas A&M University Libraries Open Educational Resources Initiative Proposal

For many learners already struggling to pay for college, the high cost of commercial textbooks poses a serious barrier to student success and can have a detrimental effect on student learning, retention, and graduation rates. We believe Texas A&M faculty can significantly contribute to the reduction, and potentially the removal, of this financial barrier and thereby enhance student success through the adoption of Open Educational Resources (OERs), as well as other low-cost to no-cost textbook alternatives.

This proposal outlines how the University Libraries will facilitate faculty adoption of OERs or library-licensed materials to provide students with alternatives to expensive commercial textbooks at Texas A&M. Our comprehensive Open Educational Resources Initiative works with Colleges and faculty to provide students with free-to-low-cost, quality alternatives to commercial textbooks which will improve student access to Texas A&M while simultaneously supporting important University educational initiatives. The Open Educational Resources Initiative builds awareness of the need to address the high cost of commercial textbooks among the A&M community and directly supports faculty adoption of existing OERs, adaption of OERs and library resources to serve as instructional resources for specific courses, and the creation of new, innovative OERs.

Our Assumptions

- Some students delay or forgo purchasing high cost, commercial textbooks which they cannot afford, adversely affecting their learning outcomes, completion rates, and timely graduation. Students who forgo textbooks are more susceptible to academic distress and poor retention.
- The adoption of OER’s helps increase access to education for all socio-economic groups, including first-generation and traditionally underrepresented students.
- Instructor customization of OERs improves alignment of the instructional materials with student learning outcomes at the individual course level and throughout a degree program.

Program Initiatives

The OERI Program takes a three-pronged approach:

1. ADOPT

The OERI Program will work strategically with instructors of lower-level, large enrollment, introductory courses to adopt established Open Access textbooks from OpenStax, a non-profit open textbook publisher based at Rice University. OpenStax textbooks can be accessed and downloaded for free or purchased in print at a low cost, and may be used with paid homework software and other products if faculty choose.

- Timeline to adoption: Within the next 2 years
- Rationale: Introductory-level courses are best suited for the adoption of existing OA textbooks, contributing to improved student retention in the first and second year of college. The existing OA textbooks available from OpenStax have been mapped to the corresponding Texas A&M courses (Table 1).
- Outcomes: The adoption of OA textbook replacements would generate a maximum, potential savings to students for each class as shown in Table 1 with a potential, grand total of over 6 million dollars annually.

1 Open Educational Resources (OER) are teaching, learning, and research resources, including textbooks, that are free of cost and access barriers and also carry legal permission for open use.

University Libraries Proposal | Open Educational Resources
1. Adopting OER

(open textbooks, open courses)
Open Textbooks

- Free online
- Free PDF
- Free ePub
- Print $49.73
- Instructor can adapt and distribute

http://openstaxcollege.org/textbooks/college-physics
• Captured from http://openstaxcollege.org/
• Building 20 open textbooks for highest enrollment courses

• Educational tools to support books and sustainability

• Authors paid

• $30 million saved by students

• Captured from http://openstaxcollege.org/
Catalog of open textbooks containing 100+

- Faculty reviews
- Runs workshops at campuses
- BCCampus is a partner

http://open.umn.edu
2. Adapt OER

(OCW, repositories)
Adapt Resources for Specific Courses

1. Library Resources
2. OER Repositories
3. Course Repositories
“The idea is simple: to publish all of our course materials online and make them widely available to everyone.”
Dick K.P. Yue, Professor, MIT School of Engineering

Unlocking Knowledge
MIT OpenCourseWare (OCW) is a web-based publication of virtually all MIT course content. OCW is open and available to the world and is a permanent MIT activity.

» View a list of our most visited courses

Empowering Minds
Through OCW, educators improve courses and curricula, making their schools more effective; students find additional resources to help them succeed; and independent learners enrich their lives and use the content to tackle some of our world’s most difficult challenges, including sustainable development, climate change, and cancer eradication.

» Read more about how our materials are making a difference

• Captured from http://ocw.mit.edu/about/
• Source http://opencourselibrary.org/
• Source http://opencourselibrary.org/
See Our Open + Free Courses

NO INSTRUCTORS, NO CREDITS, NO CHARGE.
Many college and universities around the world are using our courses and unique learning platform—and now you can too! You can access course materials at no cost to you and work at your own pace. Our learning platform gives you targeted feedback as you go, which helps you know if you are mastering a topic or if you need more practice.

http://oli.cmu.edu/courses/
Free and open courses

Data driven design that include real time feedback

Data used to improve materials

Data also used in research on how students learn

NO INSTRUCTORS, NO CREDITS, NO CHARGE.

Many college and universities around the world are using our courses and unique learning platform—and now you can too! You can access course materials at no cost to you and work at your own pace. Our learning platform gives you targeted feedback as you go, which helps you know if you are mastering a topic or if you need more practice.

http://oli.cmu.edu/courses/
# Syllabus: Modern Biology - (Open + Free)

Before you begin, [Test and Configure](#) your system for use with this course.

<table>
<thead>
<tr>
<th>Modern Biology - Open and Free</th>
<th>Status</th>
</tr>
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<tbody>
<tr>
<td><strong>UNIT 1: Introduction to Modern Biology</strong></td>
<td></td>
</tr>
<tr>
<td>Module 1: Introduction</td>
<td>(Available Practice)</td>
</tr>
<tr>
<td><strong>UNIT 2: Biological Chemistry</strong></td>
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<tr>
<td>Module 2: Atoms, Functional Groups, and Water</td>
<td>(Available Practice)</td>
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<tr>
<td>Module 3: Equilibrium and pH</td>
<td>(Available Practice)</td>
</tr>
<tr>
<td>Module 4: Carbohydrates and Polysaccharides</td>
<td>(Available Practice)</td>
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</tbody>
</table>

Source
https://oli.cmu.edu/jcourse/lms/students/syllabus.do?section=434add4180020ca60127a17583becaeb
Module 2 / Introduction to Biological Chemistry

LEARNING OBJECTIVES

- List atoms (elements) found in biological systems that are most important to life, including the most common atoms and trace elements.
- Identify the more electronegative atom when comparing two atoms.
- Define a hydrogen bond and draw possible hydrogen bonds between any two appropriate molecules.
- Recognize and describe a covalent bond and inter-molecular forces (an ionic, a hydrogen bond, and van der Waals interactions) both structurally and energetically.
- Describe the properties of water that are critical for the support of living systems.
- Describe the hydrophobic effect and its significance in biological systems.

Source
https://oli.cmu.edu/jcourse/lms/students/syllabus.do?section=434add4180020ca60127a17583becaeb
OCW Scholar: Introduction to Computer Science and Programming
Prof. John Guttag

Details  Ratings and Reviews  Related

Description
This subject is aimed at students with little or no programming experience. It aims to provide students with an understanding of the role computation can play in solving problems. It also aims to help students, regardless of their major, to feel justifiably confident of their ability to write small programs that allow them to accomplish useful goals. The class will use the Python programming language.

<table>
<thead>
<tr>
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<th>Time</th>
<th>Released</th>
<th>Description</th>
<th>Popularity</th>
<th>Price</th>
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<tr>
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<td>41 min</td>
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<tr>
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<td>Free</td>
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<tr>
<td>Lecture 6: Recursion</td>
<td>49 min</td>
<td>Jan 31, 2012</td>
<td>This lecture c...</td>
<td>★ ★ ★</td>
<td>Free</td>
</tr>
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</table>

Adopt: Opportunities & challenges
3. Create OER
California Community Colleges Board of Governors Votes to Make Publicly Funded Grant and Contract Work More Accessible

*Change in regulations will enable colleges, public to access, share and build upon contracted work*

*SACRAMENTO, Calif. –* The California Community Colleges Board of Governors on Monday voted to require that any works created under contracts or grants funded by the California Community Colleges Chancellor’s Office carry the Creative Commons Attribution license that gives permission to the public to reproduce, distribute, perform, display or adapt the licensed materials for any purpose so long as the user gives attribution to the author.

The California Community Colleges now becomes the largest system of higher education in the world to require a Creative Commons Attribution license on publicly funded grants and contracts, a move that will save taxpayers and students money.

*Source*
http://www.californiacommunitycolleges.cccco.edu/Portals/0/DocDownloads/PressReleases/SEP2013/PRESS_RELEASE_CreativeCommonsBY_090913_FINAL.pdf
OSU open textbook initiative aims to reduce student costs, enhance learning

02/12/2014

CORVALLIS, Ore. – Oregon State University is helping its faculty members develop textbooks in their fields that will be freely accessible online to any student in the world.

The open textbook initiative is a collaboration between OSU Libraries, OSU Press and OSU Extended Campus that provides financial, technical and editorial support for faculty members to create “open” texts that aim to reduce costs for students and further position Oregon State as a leader in research and teaching.
Open Textbook Project

BCcampus is contributing to the development of an open future for teaching practices and educational resources.

The B.C. Open Textbook Project is funded by the BC Ministry of Advanced Education, and BCcampus is tasked with managing it. A goal of the Project is to provide flexible and affordable access to higher education resources in B.C. by making available 40 openly-licensed textbooks. These texts will be available for selection by B.C. faculty, and digital versions of the texts will be free of charge to students. For those who prefer a printed copy, this format will also be available on demand for a low cost.

To find an Open Textbook, or find more information about the project, please see our OpenEd website.

There are three broad phases to the project (these are links to a separate web site):
Textbooks and Teaching Materials

While much of the textbook publishing world continues in more traditional patterns, there has recently been an explosion in the world of open education, with Open Educational Resources (OER) and open online courses growing rapidly. California recently passed a law enabling greater use and creation of open educational resources throughout its public educational system. The University of Minnesota is supporting development of high-quality open textbooks by building a catalog that includes reviews. These developments may be a big boon for students, long burdened by high costs for course materials. Openly-editable materials also allow instructors to customize materials for a particular course from multiple sources, or make changes to reflect new research developments.
• Digital coursepack pilot
• Library provides support services to faculty for identifying OA articles
• Integrates coursepack into LMS (Moodle) for student access
Adapted from slides by Kristi Jensen available under CCBY
The Open Education Initiative @ UMass Amherst

The high cost of commercial print textbooks is a major concern for both students and their parents. To address these concerns, the Provost's Office and the University Libraries launched the Open Education Initiative in the Spring of 2011. The Open Education Initiative is a faculty incentive program that encourages the use of existing low-cost or free information resources to support our students' learning. Information Literacy will also be emphasized, creating opportunities for students to develop and practice the skills of critical thinking, reasoning, communication, and integration of knowledge and perspectives.

Now in its third phase, the Open Education Initiative has generated a total savings of over $750,000 for students in classes that utilize open educational resources and library material. For more information please contact Marilyn Billings at mbillings@library.umass.edu.

http://guides.library.umass.edu/content.php?pid=87648&sid=4778777
• Offers mini grants to faculty to switch to OER/affordable materials
• Workshops and consultation sessions for 30+ faculty participants
• $1,000,000 student savings

Captured from http://guides.library.umass.edu/content.php?pid=87648&sid=4778777
About Lumen Learning

Open Educational Resources represent a largely untapped opportunity to reduce costs to both institutions and learners, while at the same time improving student success. However, many institutional leaders are unsure what to do to help their institutions, faculty, and learners take full advantage of OER.

This is where Lumen enters the picture.

Co-founded by open education visionary Dr. David Wiley and education technology strategist Kim Thanos, Lumen is dedicated to facilitating broad, successful adoption of OER.

After years of pioneering work in open education as individuals, David and Kim collaborated on the Next Generation Learning Challenges grant-funded Kaleidoscope Open Course Initiative in 2012 to replace textbooks with OER in community college classrooms. Project goals included lowering textbook costs by 50% and improving student success rates. No one was quite prepared for the actual project outcomes, which resulted in moving the cost of required textbooks to $0 and improving average student success rates by over

http://www.lumenlearning.org
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Lumen helps institutional leaders and faculty address the major challenges of OER adoption:

- Startup company provides soup to nuts support for OER adoption
- Template courses that faculty adapt
- Performs assessments on outcomes
- Finding quality content and mapping it to course learning outcomes. Lumen works with faculty around the country to review and aggregate the best OER from around the web, design these resources into Open Courses that match general education and other degree requirements, and posts these open course frameworks online. This process results in open course frameworks that are free for any individual or institution to download and use.
- Incorporating OER into academic strategy and curriculum decisions. Lumen provides strategic consulting services to help institutional leaders plan for using OER, including how and where it makes sense to introduce OER into courses and degree programs.
- Training and supporting faculty. Lumen services train and support faculty as institutions begin the process of adopting OER.
- Improving student outcomes. Lumen offers analytics and other services to help maximize student success at institutions using OER.

http://www.lumenlearning.org
The cost of college textbooks has risen 812% since 1978, more than the rates of inflation, health care, new home prices, and college tuition.

More and more, college students are unable to afford their textbooks, and as many as 70% of students have reported avoiding buying at least one textbook for their courses. Not surprisingly, these students do not do as well academically.

As of May 2013, if a TCC student purchased all of the textbooks required for a business administration degree, that student would spend $3,678.95 on new books. While used textbooks may lower this price, their availability is, at best, uneven.

But the problem with printed textbooks goes beyond financial cost; textbooks “cost” students and teachers in other ways as well.

Because textbooks are frequently written for broad audiences in the hopes that they will fill the learning support needs and be adopted by large numbers of faculty and departments, they are filled with content and exercises that are superfluous to a specific course’s learning outcomes. The cost here is in teaching efficiency and effectiveness.

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Entire 2-year degree that uses OER in every course

- Students can graduate with $0 textbook costs
- Higher course retention rates
- Available to any other college

Texas Senate Bill 810

Texas passes Open Access materials legislation

On June 9, 2017, Texas Governor Greg Abbott signed into law Senate Bill 810, a new piece of legislation designed to support Open Educational Resources in Texas. Sponsored by Sen. Lois Kolkhorst (R-18), Rep. Donna Howard (D-48), Sen. Larry Taylor (R-11), and Sen. Royce West (D-23), in response to the rising cost of college text books, this bill amends numerous sections of the Texas Educational Code in ways that provide strong support for the use and development of OA resources in Texas public colleges and universities.
IMPACT
$1M student savings, and counting
Supporting Adoption

Developmental Math Results
Percentage passing with C or better

- Spring 2011: No OER - 48.40%
- Spring 2013: All OER - 60.18%

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- Incorporating OER into academic strategy and curriculum decisions.
- Training and supporting faculty.
- Improving student outcomes.

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Adapted from slides by David Wiley available under CC BY at http://www.slideshare.net/opencontent

n=2,842
The Medieval Lecture

(public domain)
The Modern Lecture

Course Transformations

1. Flipped classrooms
2. Case-based courses/PBL
3. Student-centered learning
Taking Action?

Dr. Bruce Herbert, Director
beherbert@tamu.edu
@drbruceherbert