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Open Educational Resources: the First 2500 Years

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These slides can be found at https://poritz.net/j/share/OAW18atDUpt1

Some Roots of **Open**: A Morality Play...

The School of Athens by Raffaello Sanzio



Image in the public domain: Raffaello died in 1520. Original in the *Stanza della Segnatura* in the Vatican. This version: https://commons.wikimedia.org/wiki/File:%22The_School_of_Athens%22_by_Raffaello_Sanzio_da_Urbino.jpg.

Pythagoras: Keeping Knowledge Secret on Pain of Death



He didn't prove or originate "his" theorem.
The *Pythagoreans* were not unlike a *cult*, with odd dietary restrictions, belief in their leader's magical powers (talking to animals, *etc.*), divided as:

- *mathematikoi* ["learners"] who lived apart and knew hidden mysteries (*e.g.*, that $\sqrt{2}$ is irrational[1]); and
- *akousmatikoi* ["listeners"] who lived with their families and only aspired to greater secrets.

Hippasus of Metapontum, a renegade mathematikos, was tracked down and executed for the crime of revealing to the public that $\sqrt{2}$ is irrational.

[Pythagoras himself was killed when unwilling to step into a bean field despite being pursued by an angry mob.]

[1] meaning that there do not exist whole numbers p and q such that $\sqrt{2} = p/q$

Euclid's Radical Openness

He was a librarian. [in Ptolemaic Alexandria]
His *Elements of Geometry* had more editions and influence than any other book [in the West; other than the Christian Bible].
The Elements was loved by Galileo, Newton, Hobbes, Spinoza, Descartes, Abraham Lincoln, Albert Einstein ... and many, many others[2]
For hundreds of years [in the west] it was considered a right of passage in the education of [yes, male and elite] young people to master *The Elements*.



The Elements was so influential because it was completely open, laying out all of its Theorems **with proofs** [including one that $\sqrt{2} \notin \mathbb{Q}$].

Proofs are like like the source code if a theorem were a program: Yes, Euclid was doing FLOSS [free/libre/open-source software] more than 2K years before the invention of the computer!

[2] *E.g., Moby Dick* says that the difficulty of whales mentally putting together the two images perceived by their widely separated eyes must be as if a human were "simultaneously to go through the demonstrations of two distinct problems in Euclid."

Open's Antiquity ... and Skipping to Early Modernism

So: **Open** as a scholarly practice did not start with the founding of `reddit`, or with Linus Torvalds or Richard Stallman or Larry Lessig. Instead it has a long a beautiful history.[3]

Let us skip past a few uneventful years (rise and fall of the Roman Empire, the Black Death, the Renaissance – wait: Hi, Raffaello! – the Protestant Reformation, *etc., etc.*), until the beginnings of classical Liberalism and Capitalism as the *ancien régime* began to start to crumble....

The idea [of people like Adam Smith] was to motivate people to do the "right things" in society by market forces: the whole dynamic of Capitalism with its producers always pressured to make better goods because consumers vote with their feet for the best products, by walking over to the purveyors of those better versions.

[3] Even a history of what goes wrong when **open** is ignored: ask me about early algebraic geometry in northern Italy.

The Copyright Clause

Article I, Section 8, Clause 8. the *Copyright Clause*, of the US Constitution, gives Congress the power

> *"To promote the Progress of Science and useful Arts, by securing for limited Times to Authors and Inventors the exclusive Right to their respective Writings and Discoveries."*

This *exclusive Right* includes: performance, public display, copying, distribution, and creation of derivative works.

See my Copyright Cheat Sheet For University Faculty for one academic's[4] explanation of many aspects of copyright law.

The *limited Times* have been changed – extended! – again and again by Congress. Currently in the US, copyrights last for the life of the author plus 70 years ... but there are many details to consider, including exceptions such as *fair use*.

[4] Not a lawyer!

Yes, Milton, Markets Can Fail 1

A bookshelf in my office at the math department at CSU-Pueblo, containing mostly books[5] I used as an advanced undergrad and grad student.



[5] And some juggling equipment.

Yes, Milton, Markets Can Fail 2

Books sent to me, for free, without my asking, by textbook publishers [thrown under a side table]:



Yes, Milton, Markets Can Fail 3

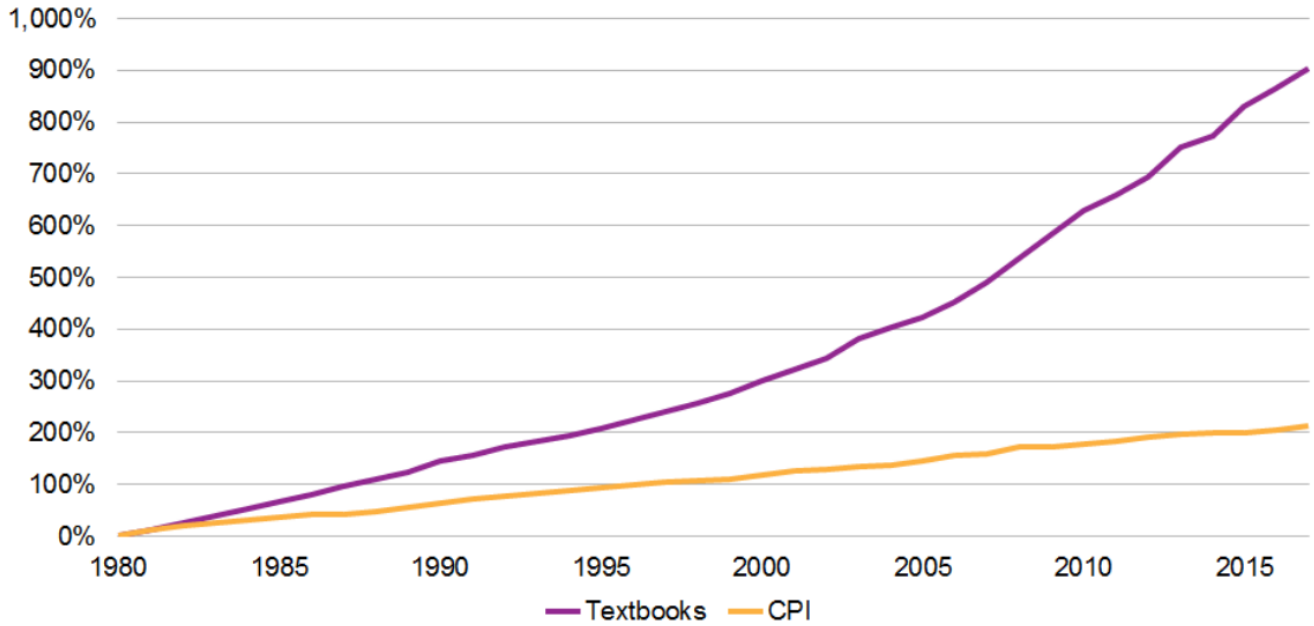
Result of a short visit to `Amazon.com` (which is usually significantly cheaper than our campus bookstore) to price just a few of those books:



Yes, Milton, Markets Can Fail 4

Rather than the usual capitalist feedback between buyer and seller, for textbooks the buyer [a student] is different from the decider [the professor]. Indeed, the decider [professor] is given not only free units, but also is bribed by the seller with many other goodies [test banks, homework solution books, PowerPoint decks for classroom use, *etc.*]. And so...

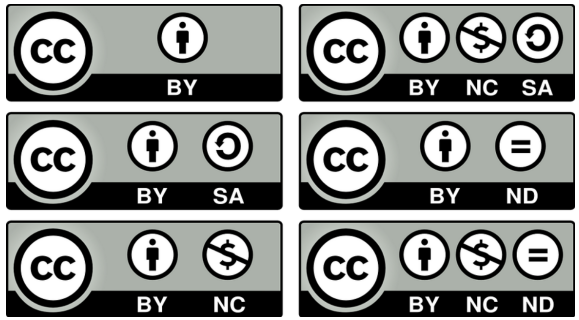
Increase in textbook costs since 1980



Source: *U.S. Bureau of Labor Statistics*

The Euclidean Response to Copyright's Overreach

There is an intricate counter-move to the restrictions copyrights put on scholarly work, which actually *uses the powers of copyright to force openness*: **Creative Commons licenses**[6].



All of these licenses allow distribution and repurposing. But Euclid probably would have been uncomfortable with the restrictions an **ND** [=**NoDerivatives**] would place on future scholarship. So while all CC licensed educational materials have the advantage of reduced cost – usually nearly all the way to $0 – we disallow "ND" in this definition:

[6] See https://creativecommons.org or my Creative Commons Cheat Sheet for University Faculty.

A Definition of Open Educational Resources

(6) "OPEN EDUCATIONAL RESOURCES" MEANS HIGH-QUALITY TEACHING, LEARNING, AND RESEARCH RESOURCES THAT RESIDE IN THE PUBLIC DOMAIN OR HAVE BEEN RELEASED UNDER AN INTELLECTUAL PROPERTY LICENSE THAT PERMITS FREE USE OR REPURPOSING BY OTHERS AND MAY INCLUDE OTHER RESOURCES THAT ARE LEGALLY AVAILABLE AND AVAILABLE TO STUDENTS FOR FREE OR VERY LOW COST. OPEN EDUCATIONAL RESOURCES MAY INCLUDE FULL COURSES, COURSE MATERIALS, MODULES, TEXTBOOKS, FACULTY-CREATED CONTENT, STREAMING VIDEOS, EXAMS, SOFTWARE, AND OTHER TOOLS, MATERIALS, OR TECHNIQUES USED TO SUPPORT ACCESS TO KNOWLEDGE.[7]

[Notice that the term "OER" includes **free textbooks**.]

This definition is from HB18-1331, **Higher Education Open Educational Resources**, passed by the Colorado General Assembly and signed by Governor Hickenlooper on 30 April 2018.

[7] Closed based on the William and Flora Hewlett Foundation's definition: *"OER are teaching, learning, and research resources that reside in the public domain or have been released under an intellectual property license that permits their free use and re-purposing by others. Open educational resources include full courses, course materials, modules, textbooks, streaming videos, tests, software, and any other tools, materials, or techniques used to support access to knowledge."*

The OER Ecosystem

There is a rich and varied ecosystem of OER, tools, related professional development opportunities, conferences, journals, online repositories, *etc.*

I will talk more about a lot of these things tomorrow – don't miss it!

For now, let's return to some economic issues.

Student Debt for Some Colorado Institutions

The easiest single indicator of exploding prices for students is:

total student debt in the U.S. is around $1.45 trillion.

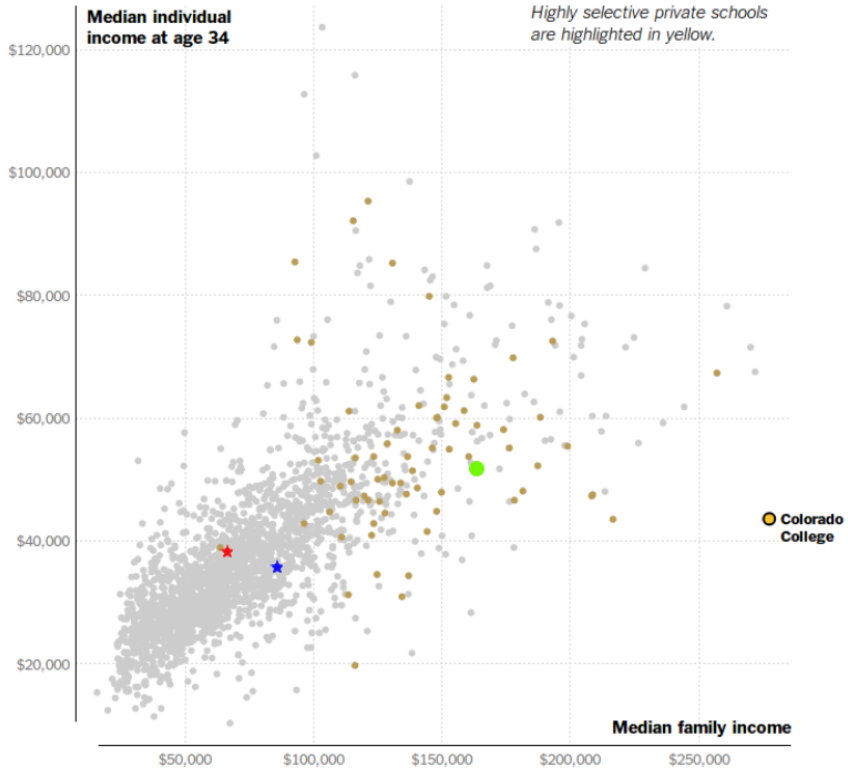
Some examples in Colorado:

Institution	Avg Debt, 2014 Grads
CSU-Pueblo	$29,914
MSU, Denver	$28,468
Colorado College	$19,756
University of Denver	$29,050
All private[non-profit] and public 4-years in CO	$25,064

2014 is most recent complete data available

Source: https://ticas.org/posd/state-state-data-2015#

Wait, Why Is Colorado College So Different?



Source: *The New York Times*, built on data from *The Equality of Opportunity Project*

Interactive tool at https://www.nytimes.com/interactive/projects/college-mobility

In case you're curious, ★ is CSU-Pueblo, ★ is MSU, Denver, and ● is DU.

Food and Housing Insecurity Among Students in the US

The #RealCollege Survey found[8] in 2017 that for university students

- 36% were food insecure in the 30 days before taking the survey,
- 36% were housing insecure in the last year, and
- 9% were homeless at some point in that year.

The results for community college students were 20%, 15%, and 3% higher, respectively.

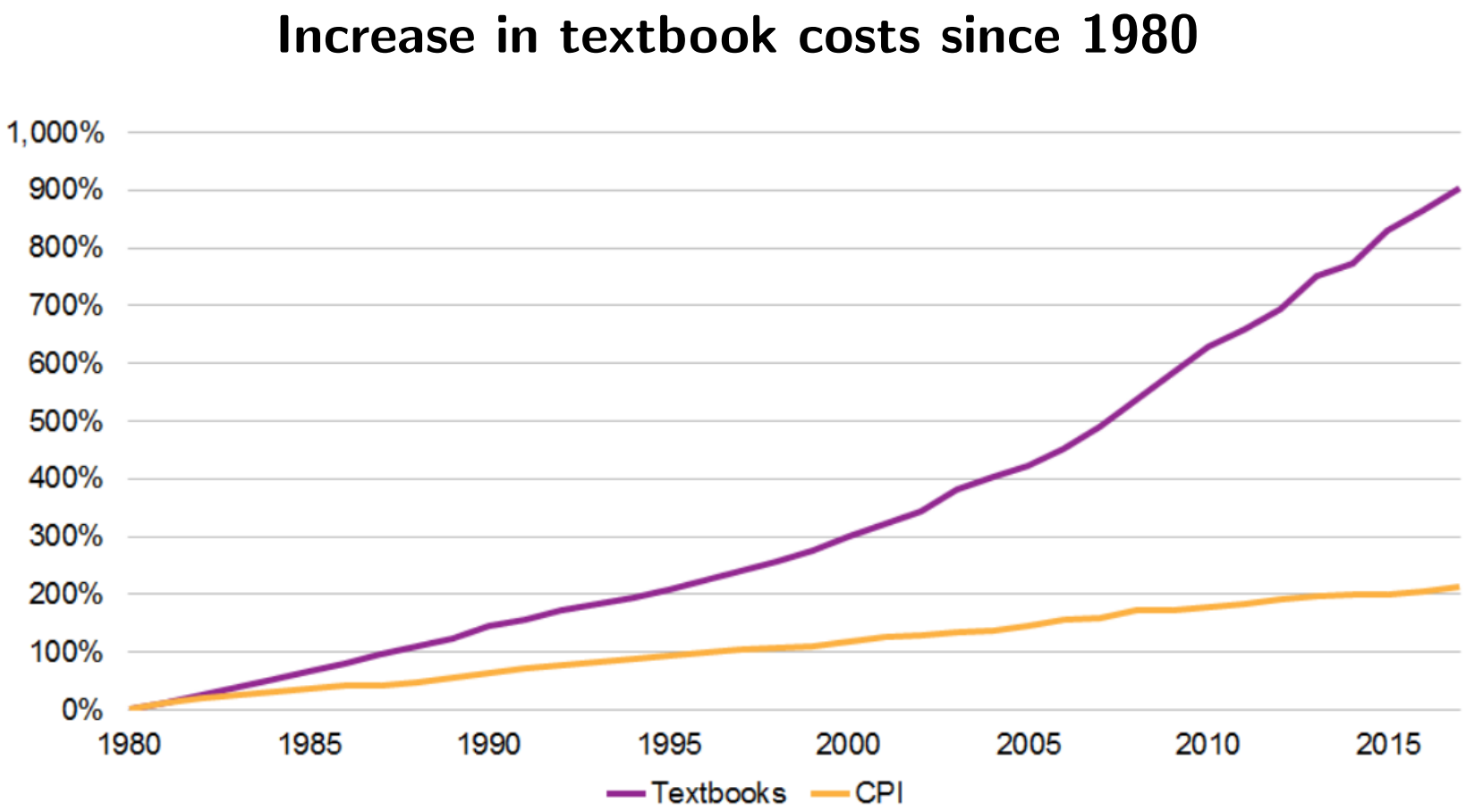
Now ask yourself: if you were a student in debt, [sometimes or often] hungry, and concerned about keeping a roof over your head ... where would your economic priorities be?

This is all very grim, but maybe mass production has reduced costs, so shouldn't textbooks be nearly free – maybe that's why we talked about **free textbooks** above.

[8] *Still Hungry and Homeless in College*, Goldrick-Rab, Richardson, Schneider, Hernandez, and Cady, 2018, on the web here.

Textbook Costs 1

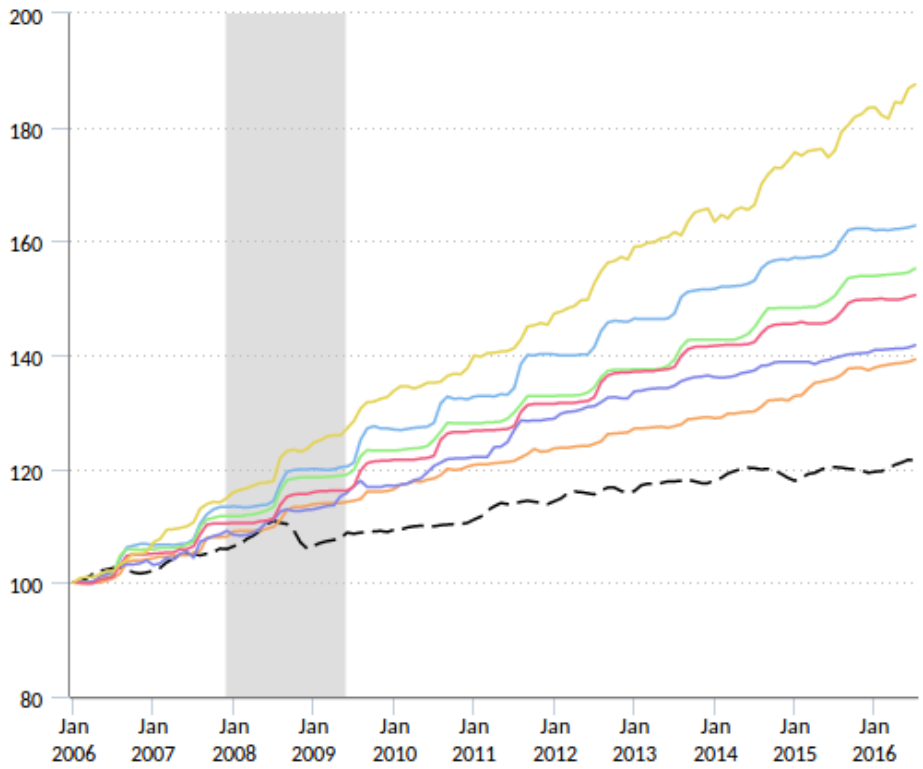
We saw this graph before:



Source: *U.S. Bureau of Labor Statistics*

Textbook Costs 2

Consumer price indices for tuition and school-related items, not seasonally adjusted, January 2006-July 2016



January 2006 = 100

Source: *U.S. Bureau of Labor Statistics*

https://www.bls.gov/opub/ted/2016/college-tuition-and-fees-increase-63-percent-since-january-2006.htm

Consequences for Students

Studies[9] have shown that, as a result of these economic realities, students

- make decisions about which courses to take based on the costs of the textbooks;
- take fewer courses because of expensive textbooks;
- do not buy even required textbooks, because of cost, and therefore learn less, do more poorly, and drop out more frequently; and
- take longer to complete degrees because of the obstacle of textbook cost.

A particularly exciting recent study[10] found that **DFW rates went down by one-third among minority and Pell-eligible students in gateway courses which switched from commercial textbooks to OER**.

[9] See references in *Report to the Joint Budget Committee and The Education Committees of the General Assembly – Open Educational Resources in Colorado*, Brown-Sica *et al.*, 2017, on the web here.

[10] *The Impact of Open Educational Resources on Various Student Success Metrics*, Colvard, Watson, and Park, **International Journal of Teaching and Learning in Higher Education** (2018), on the web here.

Conclusion of These Economic Issues

In summary:

- Grim, soulless neoliberalism has turned higher education from a public to a private good, resulting in a sky-rocketing cost to students.
- Students are in debt, and many are hungry and not confident in their housing situation.
- Textbooks costs are rising **much faster** than essentially all other consumer goods, because of a broken feedback loop in this market.
- As a result, students are learning less, doing less well, dropping out more, and taking longer to finish degrees.
- Switching to OER has large, immediate gains for student success, particular among underrepresented groups.

Playing the Guilt Card

In summary:

- Using commercial textbooks makes an institution or an individual faculty member an unwitting fellow traveler of an exploitative, extractive cartel whose bottom line is neither the good of our students nor our own pedagogical academic freedom.
- OER enable a great alternative to participation in this extractive cartel.
- The obstacles to OER adoption, adaptation, and creation, are mostly cultural [well, and some time for learning new modes of finding educational resources and teaching with them].
- This cultural change is happening right now, and it is getting to be late enough that it is hard to lead in this area – but maybe not for a *private* institution like DU – but there is still time not to be one of the laggards.

Other Cards in the Deck

In some ways, as big as the economic consequences, equally appealing are the possibilities OER enable for

- **academic freedom** and
- better pedagogy, such as the so-called **Open Educational Practices [OEP]**

More about both of these topics tomorrow!

OER, Internationally

A strong argument can be made that OER are well-situated to address several of the UN's Sustainable Development Goals.

UNESCO [to which, however, the US no long belongs] is involved in promoting, and encouraging member countries [alas, not the US] to make more use of, OER. See this site. A formal declaration is in the works....

The European Commission has some Policy Recommendations for Opening Up Education in which OER play a central role.

Some transnational NGOs, such as the Creative Commons [CC] organization, have major efforts in the area of OER, such as CC's *Open Education Platform*, and the training program Creative Commons Certificate Program.

Many countries, such as Canada, the UK, Holland, Uruguay, Bangladesh, Ghana, *etc.*, have strong OER programs. Use your *google-fu* to find out specifics.

OER, Across the US

Some programs at the federal level have started to acknowledge the use of OER.

For example, it seems that support for the creation of educational materials in the future may be aware of OER, in the sense that they encourage building upon existing OER and releasing any new work as OER.

There is also a [quite modest, considering the size of the whole US] grant program specifically to support OER projects in institutions of higher education. Probably this will be insanely hard to get, as there will likely be between one and three awards made, out of $5million dollars.

See this site if you want detailed application information.

Many states, such as NY, GA, FL, OR, CA, *etc.*, have quite advanced [and well-funded] OER programs. Again, your *google-fu* is strong, use it, Grasshopper.

OER, In Colorado

The Colorado General Assembly passed SB17-258 in 2017 and it was signed by Governor Hickenlooper on 3 May 2017. That bill created an Open Educational Resources Council to study the use of OER in Colorado's public institutions of higher education and then to make a proposal for a state program to support OER. [I was on that Council.]

The 2017 Council wrote a long report (available here) which included a detailed proposal that became, with surprisingly few changes, HB18-1331.

Beyond giving the definition of OER with which this presentation started, HB18-1331 creates a new OER Council empowered to promote the use of OER at public institutions of higher education in Colorado. [I'm on this new Council; in fact, I'm its chair.]

The Council will run conferences, build a useful website, and administer a grant program which will have around half a million dollars to disburse in the first year. Unfortunately, grants are only available for *public* institutions of higher ed, but other OER Council activities will be open to all.

Why Not Be Bold?

A number of universities around the world are building to a more OER world by trying to achieve "z-degrees" [or, in the British Commonwealth, "z-creds"]. These are entire degree programs which use only OER. Of course, to allow students to get these degrees, there must also be sufficient gen ed courses which use OER, as well as the disciplinary courses.

You could try to do this at DU – it would be very groundbreaking for a *private* institution of higher ed to have a z-degree.

Actually, just to get this started, you might look for a few **z-profs**: faculty who will commit to using OER in all of the courses they teach. This requires some education in how to use and adapt existing OER, and perhaps even support if one has to be written largely from scratch.

Steps Towards the Bold Goal

One nice thing about deciding to be a **z-prof** is that, if you have tenure, no one – not your chair, your dean, or the provost – can stop you.[11]

If you do not have tenure, the situation is a little more difficult, but with some solidarity it can be done, as well.

For me, personally, this freedom to do the right thing, both for my students and for the abstract principles of academic freedom I so adore, no matter the obstacles that may stand in my way, is one of the chief attractions of OER. I cannot do anything about the neoliberal privatization of the public good of higher ed, but I **can** make a not insignificant reduction in the total cost of being a student, for those students in my classes – all while enabling me to improve my pedagogy in that class.

In short, I assert that I am a **z-prof** and that it is good.

[11] At least, that's how I understand academic freedom to apply to the choice of textbooks.

Questions, Comments, and Contact Info

Questions? Comments?

If any occur to you later, feel free to contact me at
jonathan@poritz.net

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