MY JOURNEY INTO OPEN EDUCATIONAL RESOURCES

IOWA MAA SECTION MEETING

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About me

- Dordt is a liberal arts college in Sioux Center (northwest corner of the state)
- Currently in my 12th year there
- Project NExT Gold '14 dot

Plan for today

- What is OER?
- My pathway into OER
- Some tools to look into!

What is OER?

A DEFINITION

From the Creative Commons group:

Open Educational Resources (OER) are teaching, learning, and research materials that are either (a) in the public domain or (b) licensed in a manner that provides everyone with free and perpetual permission to engage in the 5R activities.

The Five R's are:

1. **Retain**: you can make, own, and control copies of the content
2. **Reuse**: you can use the content in a wide range of ways
3. **Revise**: you can adapt, adjust, modify, or alter it
4. **Remix**: you can combine with other material to make something new
5. **Redistribute**: you can share copies of the original or remixed versions with others

EXAMPLES

- A textbook
- An article
- Open courseware (e.g., MIT Open Courseware)
- A website
- An applet
- Computer code in an online repository
- Open access journals

BENEFITS OF OER

- Students save money
- Classroom culture
- Materials tailored to your class/approach to teaching
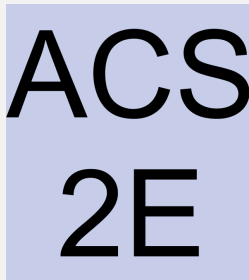- Builds community

Iowa OER COP

OER and Me

- Calculus OER written by Matt Boelkins, David Austin, and Steven Schlicker
- Started using *AC* activities in Calculus II in 2016
- Department adoption for Calculus I and II in 2018

`https://activecalculus.org/`

Active Calculus

2nd Edition

ACS

2E

Matthew Boelkins

David Austin   Christina Safranski   Steven Schlicker

EXPANDING OER USE IN MY CLASSES

- Math 149: Explorations in Modern Math
- Math 152: Calculus I
- Math 153: Calculus II
- Math 203: Elementary Linear Algebra
- Math 212: Discrete Structures
- Math 303: Advanced Linear Algebra
- Math 304: Abstract Algebra I
- Math 305: Abstract Algebra II
- Math 311: Real Analysis
- Stat 203: Generalized Linear Models

MATH 304: ABSTRACT ALGEBRA I

- Rewrote course descriptions in 2017 to shuffle the order of topics between Abstract Algebra I and II
- Melissa Lindsey and I wrote *Rings with Inquiry* in LaTeX, AIM converted to PreTeXt for Fall 2020
- Structure: Lots of theorems, virtually no proofs
- Iterated every year or so since

EXPLORATIONS IN MODERN MATH: A LIBERAL ARTS MATH OER

- Course Goal: provide a rich quantitative reasoning experience for students in the arts, humanities, and education
- OER began as course lecture notes, iterated and rewritten in PreTeXt
- Supported by a grant from the Iowa Private Academic Libraries group in 2021
- Structure: activities and explorations intended for small group work

Technical Details

Caveat: There are lots of ways to do this!

- Text/code editor (can be free)
- An installation of `pretext-cli`, a Python package (free)
- A web server (could be free)

PRETEXT

- Initial development of MathBookXML by Rob Beezer by (roughly) 2014
- Renamed PreTeXt in 2017
- XML-based markup language which uses $\LaTeX$ for mathematical symbols
- Write once, output in lots of different formats
- Built with accessibility in mind

Theorem 2.2.17.

Every PID is a UFD.

▸ Hint.

Theorem 2.2.17.

Every PID is a UFD.

▾ Hint.

> *For part 2 of the definition, use induction on the number of irreducible divisors of an arbitrary nonzero nonunit. Mimic the proof of* Theorem A.2.9.

Theorem 2.2.17.

Every PID is a UFD.

▾ Hint.

> *For part 2 of the definition, use induction on the number of irreducible divisors of an arbitrary nonzero nonunit. Mimic the proof of* Theorem A.2.9.

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THE PRETEXT CODE

```
1  <theorem xml:id="thm_pidisufd">
2    <idx>
3      <h>unique factorization domain (UFD)</h>
4      <h>PIDs are UFDs</h>
5    </idx>
6    <statement>
7      <p>Every PID is a UFD.</p>
8    </statement>
9    <hint>
10     <p>
11       For part 2 of the definition, use induction on the number of
            irreducible divisors of an arbitrary nonzero nonunit.
12       Mimic the proof of <xref ref="theorem_FTAuniqueness" />.
13     </p>
14   </hint>
15 </theorem>
```

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HOW COULD I GET STARTED WITH OER?

- Find an OER and consider adopting (part of?) it!
- Polish something you've made and put it online!
- Find others who are interested in your department or on your campus and work through the modules on `IowaOER.com`
- Look for grant opportunities!

https://mkjanssen.org/maa_section2025.html

Thank you!