APEX Calculus: A Progress Report

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- 2006: Began writing *Fundamentals of Matrix Algebra*
- 2010/11: Troy Siemers wrote *An Introduction to MATLAB and Mathcad*

Big Question: Why are *we* not doing this more?

Why Not Write?

1. Interest
2. Cost/Benefit Analysis

   Costs = Time

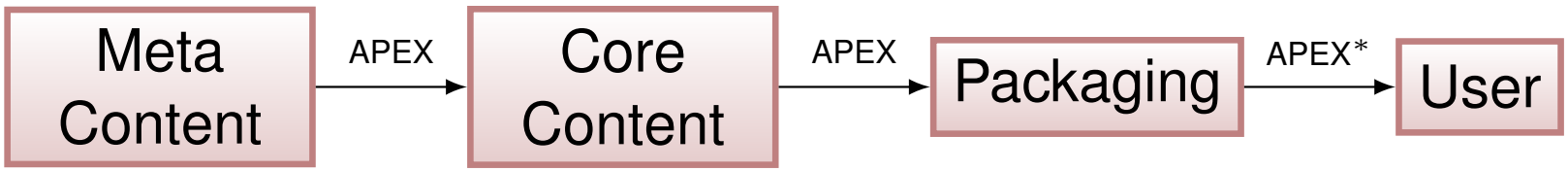
   (a) Free time
   (b) Research time
   (c) Teaching time

   Benefits $\neq$ Money

APEX

APEX: Affordable Print and Electronic teXtbooks

Collaboratively write/produce textbooks, mitigating costs



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A Jackson-Hope grant was awarded for the writing of an open Calculus text (through “Calc II”).

Provides course releases to accommodate writing.

Goals:

1. Write a calculus textbook . . .
2. . . . collaboratively.
3. Make an impact beyond VMI.

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Benefits:

1. Students get a tailored coursebook
2. Low cost
3. Portable/accessible
4. The joy of writing

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Current Collaboration:

- Brian Heinold, Mount St. Mary's University
- Jen Bowen, College of Wooster
- Troy Siemers, VMI

Basic Design Principles

1. Open
   - Collaborative in nature
   - Adaptable
   - Low cost

Basic Design Principles

2. Traditional Style – lower adoption hurdles

Example:
Limits $\rightarrow$ Derivatives $\rightarrow$ Appls. $\rightarrow$ Integration $\rightarrow$ Appls., etc.

Basic Design Principles

3. Upfront Writing
   - Technology is ubiquitous. When doing things “by hand” that technology does quickly, *justify it* or don’t do it at all. (Curve sketching is a good example.)
   - Contrived “application” problems are either absent or admittedly contrived.
   - Show other discipline’s dependencies on calculus.

Basic Design Principles

4. Exercise Sets
   - Vocabulary/Concepts
   - Practice

Current Progress

"Finished" Chapters:

1. Limits (6 sections)
2. Derivatives (7 sections)
3. Graphical Behavior of Functions (5 sections)
4. Applications of the Derivative (4 sections)
5. Integration (4 sections)
6. Integration Techniques (partial) (2 sections)

Samples

- Notes space
- “Longpage” format

Work To Be Completed

- Exercise Sets
- Calc II & III

How To Get Involved

1. Author
   (a) Text
   (b) Examples
   (c) Exercises
   (d) Illustrations
   (e) Other - applets, animations, manipulations, etc.
2. Editing
3. Production
   (a) LaTeX macros, etc.
   (b) Illustrations/graphics

How To Get Involved

4. Ideas

   This is currently “Calculus 1.0,” consisting of a paper text and easily accessible .pdf’s. What would make this a true e–text? What technology is needed?

How To Get Involved II

Adopt an open textbook!

- collegeopentextbooks.org
- merlot.org
- Connexions – cnx.org

Contact

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