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The Living Textbook Project for Affordable Higher Education

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The Living Textbook Project for Affordable Higher Education.



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Affiliations:

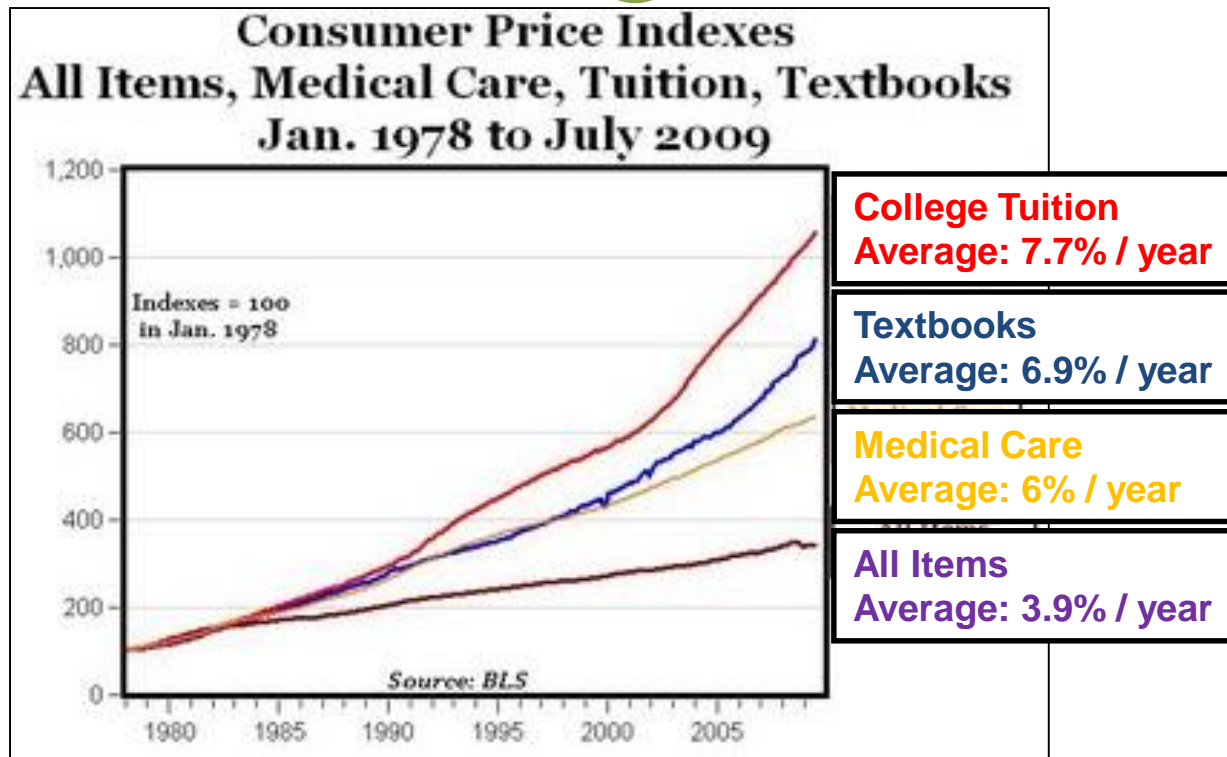
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Costs, inflexibility, & wasted effort: The Textbook Problem



The cost of college textbooks (BLS category "educational books and supplies") has risen much higher than the overall CPI since 1978, almost 7% annually on average for textbooks versus less than 4% for all goods and services. Textbook prices have increased faster than even the cost of **medical care** (6%).

Courtesy of Prof Delmar Larson

Cost of Textbooks



- Average cost of a new chemistry textbook - \$180.00
 - Study guide -\$ 60.00
 - Solutions Manual -\$ 50.00
-
- Average 20 students per class
 - Four classes/semester
 - Three semesters/year
-
- ✦ Almost 70K/year for textbooks alone!!!
 - ✦ Cost of textbooks almost equal to cost of tuition in the community colleges!!

How other countries handle the situation



- Universities print their own textbooks
 - Open University of Sri Lanka
 - Affordable education for working students
 - Student group very similar to that of community colleges
 - OUSL academic staff collaborate in writing the necessary textbooks
 - The books are printed in-house and sold to students at a nominal price.
 - University ends up making a tidy profit even after paying for printing upkeep!
 - If a developing country can do this why cant we??

Paper Textbooks



- Environmentally unfriendly – NOT COOL!
- Static information- new findings require new editions
- Not expandable - different levels require different books
- No embedded multimedia
- No simulations
- Not interactive
- Not easily usable in the modern day learning climate

What is needed



- **Online platform with local updating copies**
 - Faster wireless and wireless broadband.
 - Wireless broadband cost is too high
 - Accessing an online platform over a long period of time can be costly
 - Locally updating copies avoid this.
- **Multiplatform oriented**
 - Tablets (iPad, Galaxy Tab, Xoom, PlayBook)
 - Slates and convertibles (EliteBook, ThinkPad, LifeBook, EeeSlate)
 - Smart Phones (iPhone, Galaxy S, BlackBerry, Windows Phone)
- **Text highlight and note taking functions**
 - Slates – pen, touch, gesture and voice
 - Tablets and smartphones – touch, and voice
- **Interactive in nature**
 - Use touch and gesture driven interfaces to maximum advantage

What is needed



- **Multimedia oriented**
 - **Video demonstrations**
 - ✦ Laboratory demonstrations
 - ✦ Industrial applications
 - ✦ Occurences in nature
 - **Animations**
 - ✦ Kinetic Molecular Theory of gases.
 - ✦ Gas laws
 - **3D system integration**
 - ✦ Vuzix, Sony 3D
 - ✦ Immersive experiences

What is needed



- Incremental addition of new information
 - No need to write an entire book for a few small inclusions
 - Increases the long term value of the investment.
- Seamless integration of new information
 - Stick to a modular approach
 - Easier to rewrite smaller modules

What is needed



- Test banks and home work problems
 - Adaptive problem solving strategies

- Starter slides for lectures
 - Use embedded metadata for automatic starter slide generation
 - Separate database of slides for teaching?

What is needed



- Content separated from design.
 - Master files for layout (style sheets)
 - Separates content from design
 - Allows information to be adapted to the platform being used.
 - Future proofs information by allowing easy migration to newer platforms
 - Allows print layouts to be generated very easily

What is needed



- Ability to obtain student feedback. Students should be able to;
 - Highlight a section that is well written, give it a passing grade with reasons
 - Highlight sections badly written, give a failing grade with reasons.
 - Allow students to suggest alternate ways of writing badly written sections
 - Sections receiving above a threshold failing grade, sent back for re writing, suggestions will be useful
 - Sections receiving passing grades above a threshold will be used as templates for new sections

What I propose



- The writing of the textbook be of a collaborative nature
 - VCCS – many colleges with a lot of full time and adjunct faculty
 - Different sections get distributed among different groups will speed things up significantly
- Cross checking of the information by different people within the same group
- Those that pass validation be opened for student scrutiny on a trial basis.
- Following the trial period, go mainstream with the text book.

Funding for the project



- Government
 - Election year!
 - Real interest in bringing higher education costs down.
 - Infrastructure needed is quite cheap
- Nominal textbook fee (\$10.00/student) used for day to day maintenance of the server and the textbooks

Examples



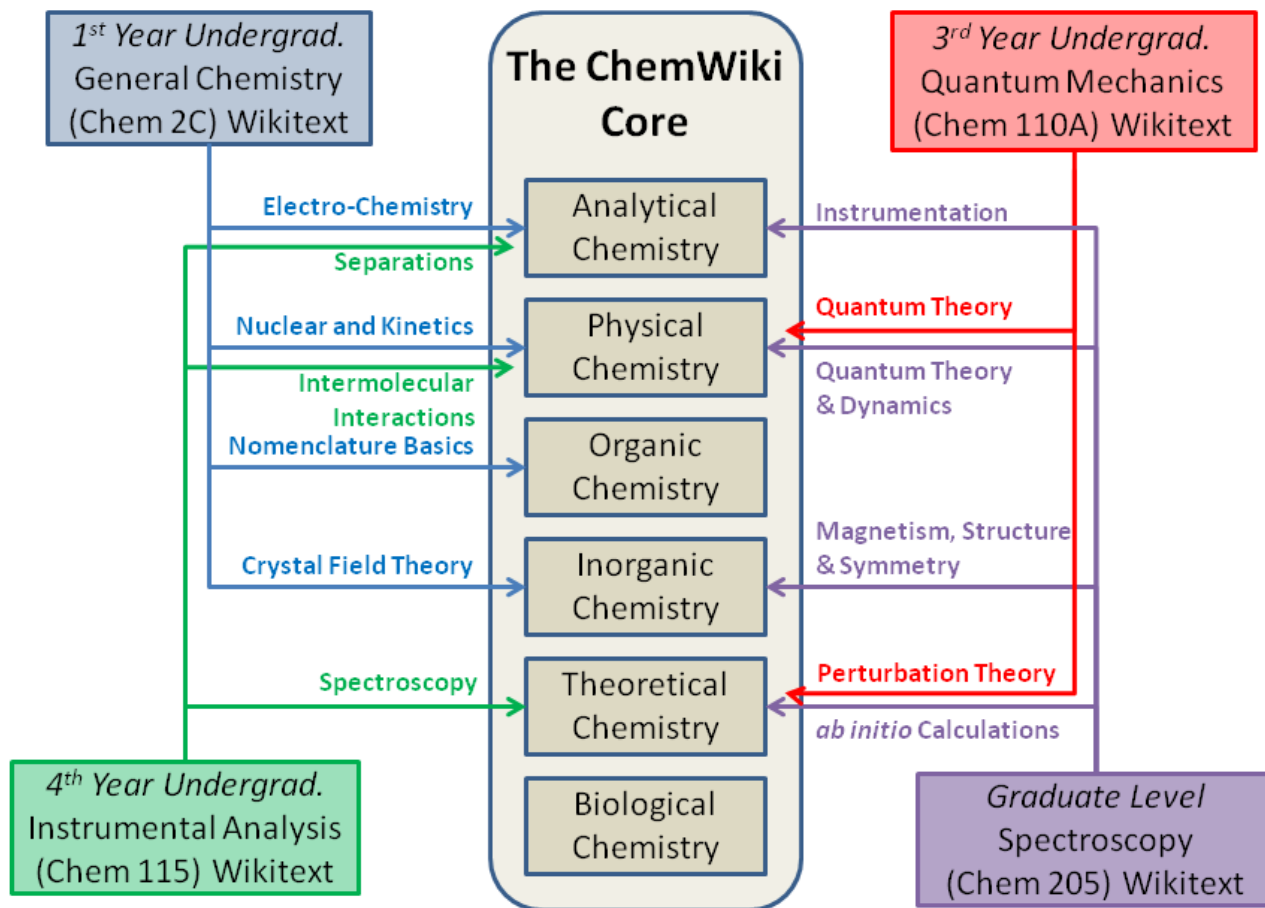
- Wikipedia
- Citizendium
- ChemWiki

ChemWiki-The Dynamic Chemistry Textbook



- “The ChemWiki is a unique approach toward chemistry education where a textbook environment is constantly being written and re-written partly by students and partly by faculty members resulting in a free General Chemistry textbook to supplant conventional costly paper-based books.”
- Multi-personal multi-university approach.
- Currently hosted by the Larson group at UC Davis.

ChemWiki



SARIS



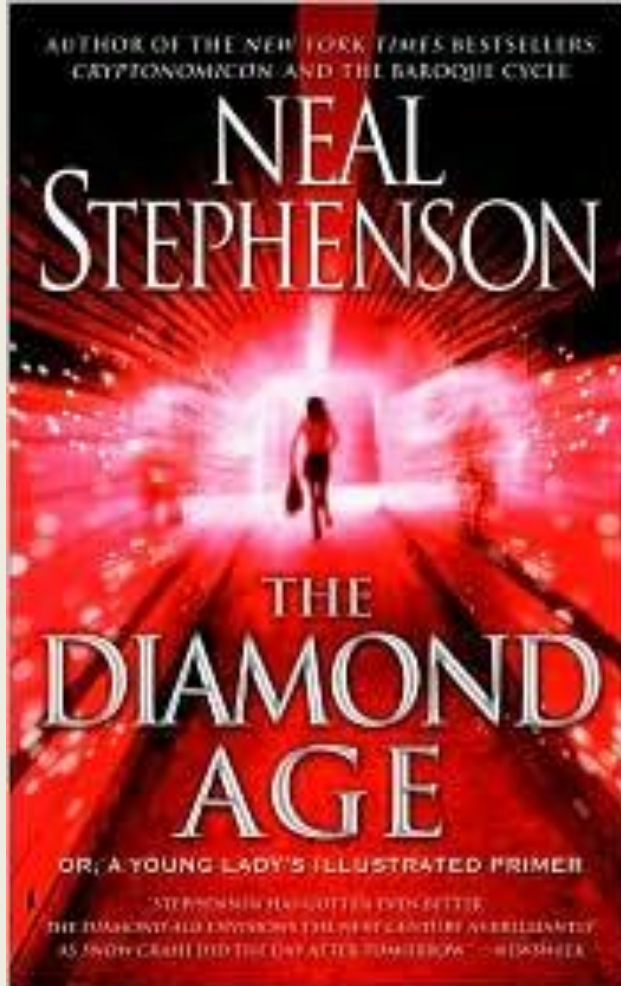
- Student Ability Rating and Inquiry System.
- Once implemented, aims to track student performance
- Tightly integrated with ChemWiki
- Really interesting approach for training students in problem solving using performance related feedback.

Conclusion



- Cost of textbooks are too high for community college students
- This can be easily addressed if we start writing our own.
- Instead of writing a paper textbook, use wiki based text book
- Majority of the technological framework is already in place.
- Majority of peer reviewed content is already in place
- Lets Do It!

The Diamond Age



- Describes a textbook.
 - Interactive
 - Multimedia
 - Adaptive
 - Layered
 - Education starts as a story