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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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NEXUS OF SCIENCE, LLC.
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!!
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 can't 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 textbook.
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
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.
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