Welcome! Twenty Years of LON-CAPA Reception

History of Course Management Systems at MSU

- CAPA
- LON-CAPA
- VU Widgets (Support Tools)
- ITDS Public Widgets
- DAT Tools (Support Tools)
- Blackboard
- ANGEL
- Google Apps for Education (Support Tools)
- Moodle
- Desire2Learn

Academic Year Starting Fall of...
Why traditional publishers will be history five years from now

Gerd Kortemeyer
Lyman Briggs
Disclaimer

- Some of my best friends and colleagues wrote textbooks
- Sorry guys!
A Short History of the Textbook

- 14th century
- We had to lecture (read the book), because the students did not have textbooks
A Short History of the Textbook

- 15th century
- Movable letters paved the way toward affordable textbooks
- We could use lectures for other activities …
  - but more often than not miss that opportunity
A Short History of the Textbook

- Earlier 20th century
- Textbooks provided an affordable way to get study materials into the hands of many students
  - No photo copiers
  - No web
- Required textbooks largely a US phenomenon
A Short History of the Textbook

- Later 20th century
- The Web was invented
- Impact on textbook publishers: zero for at least a decade
A Short History of the Textbook

- Turn of the 21st century
- Textbooks drifting toward extinction
A Short History of the Textbook

- Heavier and heavier
  - Mass of book: 8.5 lbs
A Short History of the Textbook

• Longer and longer
  ◦ The books contain
    • more than you could possibly teach
    • more than students could possibly read

1550
CHAPTER 46
Suppose the average body press...
A Short History of the Textbook

- More and more expensive
  - Cost of ancillary materials to distinguish themselves from competitors
    - Market pressure: content material and curriculum almost indistinguishable
  - Frequent new editions to fight used textbook market
    - Cost of writing new problems to make editions intentionally incompatible
A Short History of the Textbook

- More and more contributing to the high cost of college education

Source: BLS

Bureau of Labor Statistics Data
More and more desperate

- Bundling: one-time limited-time access codes to fight used book market
  - This becomes really problematic when the access code is for homework that the students have to complete to pass the course
- Feeding back into increasing cost
A Short History of the Textbook

- More and more bizarre
  - Same book, half price in Europe
A Short History of the Textbook

- Welcome to the 21st century!
- ebooks!
- Unfortunately: digitizing the dinosaur
  - PDFs in some reader with restrictive licenses
A Short History of the Textbook

- Shortcomings of the current publisher ebooks: talk by Byron last week
  - No need to repeat
  - Talk available online

Quality Issues

1) Navigation
2) Static content (pdf’s)
3) Viewing issues on some devices
4) Printing and hard copy availability
5) Contract problems (180 day license; IP address issues)
A Short History of the Textbook

- If things don’t change: textbooks will be history in five years
Let’s Change Focus

Let’s look at these!
We believe that LON-CAPA is a model for who will be in the boat.

I will discuss the idea behind the current LON-CAPA and give an outlook toward the CourseWeaver project.
Sharing of Materials

- There is a large amount of good, free educational material available
- How can these be turned into interactive etexts?
- What is usually missing is a way to:
  - catalog and verify the materials
  - get recommendations
  - sequence the materials
  - integrate the materials into a course
  - embed assessment
  - have associated peer teaching
  - control access to exam-relevant materials
Sharing of Materials

- The big leap:

  Course Management ➔ Leap ➔ Learning Content Management
Sharing of Materials

- But one institution alone will not have critical content mass to build a comprehensive portfolio of etexts.
Sharing of Materials

Inter-Institutional Network of Servers Connecting Universities and Schools
Sharing of Materials
• Pages, movies, homework, ..
Sharing of Materials

**LON-CAPA Shared Resource Pool, Summer 2011**

- Shared content repository with over 440,000 resources
- Almost 200,000 online homework problems
Sharing of Materials

LON-CAPA Domains

- Universities
- Community Colleges
- High Schools
- Publishers
- Projects

160 member institutions
Sharing of Materials

- Cross-institutional use

<table>
<thead>
<tr>
<th></th>
<th>U01</th>
<th>U04</th>
<th>PR01</th>
<th>U06</th>
<th>U17</th>
<th>U05</th>
<th>U03</th>
<th>HS20</th>
<th>U12</th>
<th>PR06</th>
<th>U08</th>
</tr>
</thead>
<tbody>
<tr>
<td>Available</td>
<td>144418</td>
<td>17545</td>
<td>10809</td>
<td>8799</td>
<td>7635</td>
<td>7037</td>
<td>5120</td>
<td>4439</td>
<td>4066</td>
<td>3750</td>
<td>2833</td>
</tr>
<tr>
<td>Used</td>
<td>38245</td>
<td>7596</td>
<td>340</td>
<td>4821</td>
<td>2908</td>
<td>4880</td>
<td>3411</td>
<td>3842</td>
<td>2811</td>
<td>1502</td>
<td>1231</td>
</tr>
<tr>
<td>Used externally</td>
<td>17099</td>
<td>1804</td>
<td>339</td>
<td>974</td>
<td>276</td>
<td>3507</td>
<td>1735</td>
<td>1035</td>
<td>1997</td>
<td>1502</td>
<td>415</td>
</tr>
<tr>
<td>Using</td>
<td>301</td>
<td>105</td>
<td>491621</td>
<td>294</td>
<td>74</td>
<td>102</td>
<td>298</td>
<td>137</td>
<td>3</td>
<td></td>
<td></td>
</tr>
<tr>
<td>U05</td>
<td>11668</td>
<td>4881</td>
<td>23</td>
<td>14</td>
<td>3</td>
<td>334357</td>
<td>866</td>
<td>29</td>
<td>500</td>
<td>328</td>
<td>5</td>
</tr>
<tr>
<td>U04</td>
<td>10343</td>
<td>2393</td>
<td>6969</td>
<td>10</td>
<td>207</td>
<td>374</td>
<td>8</td>
<td>128</td>
<td>2</td>
<td>18</td>
<td></td>
</tr>
<tr>
<td>U06</td>
<td>10089</td>
<td>2261</td>
<td>64</td>
<td>134755</td>
<td>305</td>
<td>1001</td>
<td>8</td>
<td>10</td>
<td>2</td>
<td>72</td>
<td>2</td>
</tr>
<tr>
<td>U03</td>
<td>9973</td>
<td>4053</td>
<td>58</td>
<td>27</td>
<td>5</td>
<td>841213</td>
<td>3173</td>
<td>7</td>
<td>728</td>
<td>14</td>
<td>166</td>
</tr>
<tr>
<td>U08</td>
<td>8578</td>
<td>2014</td>
<td>1078</td>
<td>6</td>
<td>2</td>
<td>2720</td>
<td>5</td>
<td>2097</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>HS20</td>
<td>6465</td>
<td>2138</td>
<td>1</td>
<td>47</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>CC04</td>
<td>6356</td>
<td>1156</td>
<td>25</td>
<td>2</td>
<td>311586</td>
<td>789</td>
<td>1971522</td>
<td>64</td>
<td>7</td>
<td></td>
<td></td>
</tr>
<tr>
<td>U17</td>
<td>6270</td>
<td>2689</td>
<td>4</td>
<td>7</td>
<td>2813</td>
<td>188</td>
<td>205</td>
<td>94</td>
<td>140</td>
<td>4</td>
<td>2</td>
</tr>
<tr>
<td>HS40</td>
<td>5251</td>
<td>3899</td>
<td>22</td>
<td>5</td>
<td>40</td>
<td>65</td>
<td>293</td>
<td>388</td>
<td>70</td>
<td>27</td>
<td>16</td>
</tr>
<tr>
<td>U14</td>
<td>5135</td>
<td>1682</td>
<td>213</td>
<td>42</td>
<td>12</td>
<td>1665</td>
<td>42</td>
<td>3</td>
<td>7</td>
<td>114</td>
<td></td>
</tr>
<tr>
<td>U09</td>
<td>4246</td>
<td>3409</td>
<td>7</td>
<td>1</td>
<td>15</td>
<td>1</td>
<td>1</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>U12</td>
<td>3768</td>
<td>184</td>
<td>136</td>
<td>760</td>
<td>2684</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>HS39</td>
<td>3467</td>
<td>2101</td>
<td>19</td>
<td>20</td>
<td>5</td>
<td>2</td>
<td>68</td>
<td>26</td>
<td>29</td>
<td>1</td>
<td>808</td>
</tr>
</tbody>
</table>

Note: Old data!
Sharing of Materials

- But wait: didn’t we try that before?
- Yes, and those are great, but we are missing the “last mile:”
  - Fine-granular content immediately ready for use
  - Aid in selecting and sequencing materials
  - Full integration into the course venue

etc.
The Last Mile Covered

Course Management

Campus A

Resource Assembly

Campus B

Resource Assembly

Shared Cross-Institutional Digital Resource Library
Resource Assembly

- Take shopping cart to the “supermarket”
Resource Assembly

• The key to re-usability is to create course-context free resources
• In other words, same resource can be used in different contexts
• This means:
  ◦ No button “next resource”
  ◦ No button “back to course menu”
  ◦ No wording such as “as we have previously seen”
  ◦ etc
Resource Assembly

- Nested Assemblies
- No pre-defined levels of granularity ("module", "chapter", etc)
  - People can never agree what those terms mean
- Re-use possible on any level
  - Customize your table of contents
Writes module about energy conservation

Compiles module about conservation laws

Wrote module about momentum conservation

Uses whole assembly in his course
Resource Assembly

- Recommender
Course Management

- Posting of materials
- Posting of homework
- Discussions
- Announcements
- Portfolios
- Scheduling
- Gradebook
- …
Course Management

- How do you use context-free re-usable resources in the context of a course?
- The system **dynamically** generates context for context-free resources:
  - Navigation (no getting lost!)
  - Contextual community functions
  - Feedback to instructors and authors
  - Gradebook integration of embedded assessment
Course Management

Assembled structure turns into the course navigation

Organized around the content, not the resource type, e.g. embedded online assessment
Course Management

- Materials, assessment, discussion
## Course Management

- Course overview/dashboard

### Course Action Items

**Go to first resource**
Page set to be displayed after you have selected a role in this course. Currently: What's New? page (user preference) Change for just this course or for all your courses.

### Problems requiring handgrading

<table>
<thead>
<tr>
<th>Problem Name</th>
<th>Number ungraded</th>
</tr>
</thead>
<tbody>
<tr>
<td>Electric Field</td>
<td>4</td>
</tr>
</tbody>
</table>

### Problems with errors

No problems with errors

### Problems with av. attempts ≥ 3 or deg. difficulty ≥ 0.8 and total number of students with submissions ≥ 4

<table>
<thead>
<tr>
<th>Resource</th>
<th>Part Num. students</th>
<th>Av. Attempts Deg.</th>
<th>Diff</th>
<th>Last Reset</th>
<th>Reset Count?</th>
</tr>
</thead>
<tbody>
<tr>
<td>Field Lines single part</td>
<td>24</td>
<td>2.12</td>
<td>0.84</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Net Force single part</td>
<td>53</td>
<td>2.49</td>
<td>0.80</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Pith Balls single part</td>
<td>52</td>
<td>4.12</td>
<td>0.90</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

### Unread course discussion posts

<table>
<thead>
<tr>
<th>Location</th>
<th>Type</th>
<th>Time of last post</th>
<th>Number of new posts</th>
</tr>
</thead>
<tbody>
<tr>
<td>Coulomb</td>
<td>Resource</td>
<td>last Monday, Jan 16 at 04:55 pm (EST)</td>
<td>1</td>
</tr>
<tr>
<td>Distance Change</td>
<td>Resource</td>
<td>last Monday, Jan 16 at 07:00 pm (EST)</td>
<td>1</td>
</tr>
<tr>
<td>Field Lines</td>
<td>Resource</td>
<td>last Monday, Jan 16 at 07:49 pm (EST)</td>
<td>1</td>
</tr>
<tr>
<td>Force</td>
<td>Resource</td>
<td>on Wednesday, Jan 11 at 07:01 pm (EST)</td>
<td>3</td>
</tr>
<tr>
<td>Net Force</td>
<td>Resource</td>
<td>23 hours, 19 minutes ago</td>
<td>5</td>
</tr>
<tr>
<td>Pith Balls</td>
<td>Resource</td>
<td>last Monday, Jan 16 at 09:21 pm (EST)</td>
<td>6</td>
</tr>
<tr>
<td>Point P</td>
<td>Resource</td>
<td>last Friday, Jan 13 at 02:24 pm (EST)</td>
<td>5</td>
</tr>
<tr>
<td>Potential</td>
<td>Resource</td>
<td>last Sunday, Jan 15 at 03:15 pm (EST)</td>
<td>1</td>
</tr>
<tr>
<td>Two Charges</td>
<td>Resource</td>
<td>last Sunday, Jan 15 at 03:26 pm (EST)</td>
<td>1</td>
</tr>
<tr>
<td>Vector</td>
<td>Resource</td>
<td>last Saturday, Jan 14 at 01:32 am (EST)</td>
<td>1</td>
</tr>
<tr>
<td>Vectors</td>
<td>Resource</td>
<td>last Saturday, Jan 14 at 12:09 pm (EST)</td>
<td>2</td>
</tr>
</tbody>
</table>

### New course messages

<table>
<thead>
<tr>
<th>Number Subject</th>
<th>Sender</th>
<th>Date/Time</th>
</tr>
</thead>
<tbody>
<tr>
<td>Feedback</td>
<td>mmar/mmp/kap18/problems/cd460/problem</td>
<td>Sat Jan 14 10:45:02 2006 (EST)</td>
</tr>
</tbody>
</table>

### New critical messages in course

No unread critical messages in course
CourseWeaver

- Our next generation: CourseWeaver
- Building on LON-CAPA concept
- Learning Content Management for Open Educational Content (OER)
- Launched at LON-CAPA Conference at UIUC in June
CourseWeaver

- Preliminary list of potential partners:
  - … yes, careful, careful … only three months into it

Not official yet
CourseWeaver

- Updated infrastructure
  - Dynamic cloud
- Better rights management
- Better information flow for dynamic metadata
- Cleanup, cleanup, …
- Commercial content?
- Interface changes
CourseWeaver

First Generation CMS: DC 10
CourseWeaver

Next Generation CMS: Airbus
CourseWeaver

- Estimates:
  - Four years
  - Four million dollars
CourseWeaver

- There is only one problem: sustainability
- Where do we go beyond initial grant funding?
- Are we just parasitic on traditional higher education?
  - Or is this maybe (just maybe) part of our core business?
- But: we have done this for 20 years!
Are we going to assume some leadership?
Or are we just followers?