

*MFA Review: Project One*

**Aplia Text**

Web-Based Application  
Project Developed Outside of SCAD  
2008-10

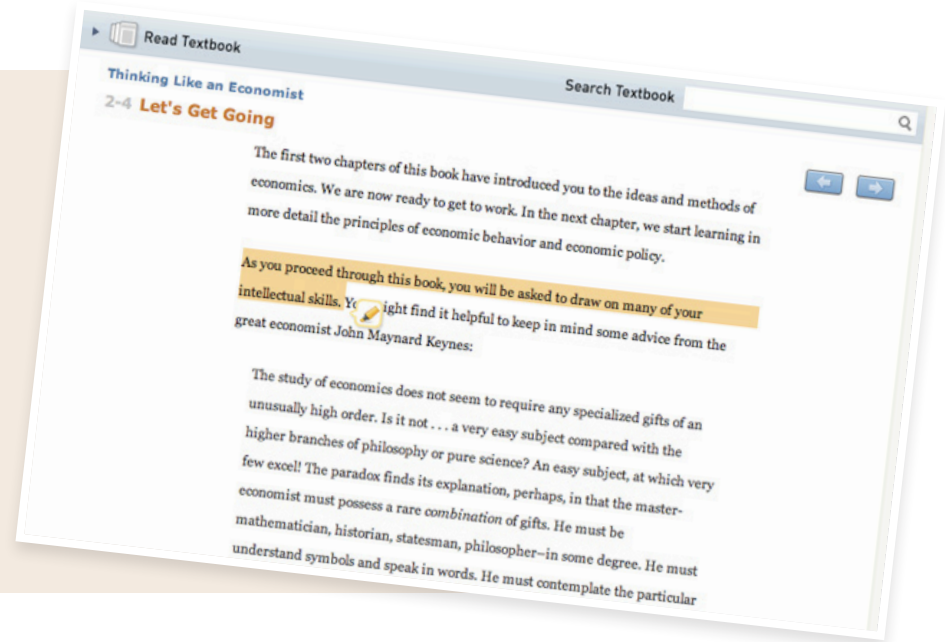
Hi!



**Artie Kuhn**  
Savannah College of Art and Design  
MFA 45-Hour Review

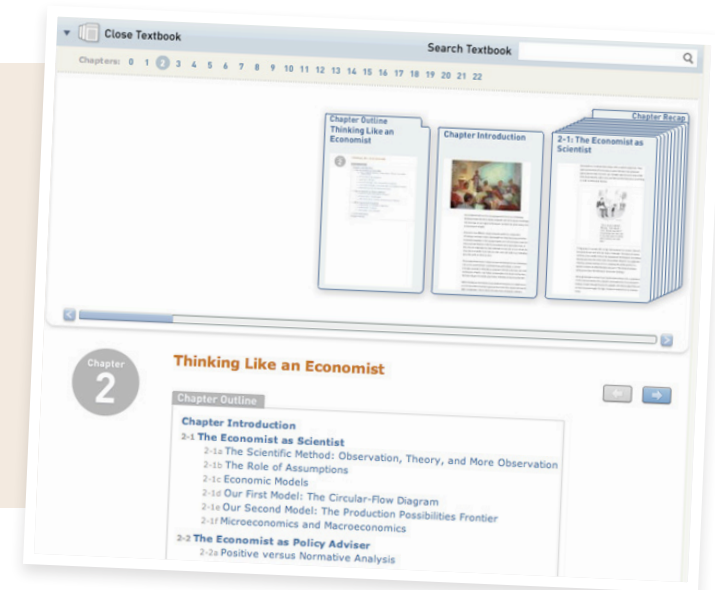
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## Aplia Text: Overview

Innovative eBook built on user-centric design principles. Navigation within the web-based application used an innovative “flipbook” that used concepts from data visualization to improve the reading experience. Intuitive interface enabled students to quickly highlight key passages.



## Aplia Text: The Problem

Aplia was successful as a start up specializing in rich online homework. Aplia had partnered with textbook publishers to deliver flat textbooks in Flash Paper. They were acquired by the textbook publisher I worked for. Some time after the acquisition, I was asked to join a team to develop a better way to deliver the textbook content within the Aplia platform.

I lead our team in two research initiatives. The first was to engage in ethnographic research to understand how a textbook fit into students' workflow. The second was to analyze the usage data of our existing online textbook platforms and look for usage trends.

After we surveyed and interviewed students from a wide variety of disciplines, we realized that the traditional eBook approach of trying to simulate the physical book was the wrong approach. Instead, we realized that we needed to design an eBook experience that fully leveraged the benefits of an online environment rather than just be a static book on a screen. This meant we would need to rethink the look and feel of each title.

The usage analysis provided one key insight: students do not read online in a linear fashion and then do their associated homework. Instead, most began by answering as many questions as they can of their homework. They then look through their textbook to round out their knowledge. We summarized students as "doers, skimmers and scanners". This was confirmed in our interviews and "shoulder surfing" of students. Because of this, we came to the conclusion that components, like a table of contents,

simply wouldn't solve the problems students were having with finding relevant course material, nor was it very engaging.

We also noticed a puzzling contrast in how students used highlights in physical books vs digital books. We noticed time and time again that students that used physical books highlighted their material like crazy. Some even went so far as to chose used books which had been highlighted by their previous owners. However, when we looked at usage patterns in other digital books, we saw an exceptional low number of highlights or notations. After shoulder surfing again, we realized that highlighting in most eBooks is not intuitive or useful and, thus, not common.

After this research phase was complete, our multi-sight team met in a week-long IDEO-style summit where key stake holders gathered to review research, identify the problems to solve and propose solutions. Soon after the summit, I was chosen to lead the group in the creation of Aplia Text. This meant everything from assisting with and testing the UX, art direction of the UI, approving overall development architecture and craft the front-end HTML/CSS and Flash-based components.



## MFA Review: Project One

# Aplia Text: The Solution

I began by thinking, with our team, through the high-level problems that we wanted to solve in the ebook platform: develop a way to merge the aesthetics of the Aplia product with the aesthetics of the individual books, create a UX that helped students be more effective and efficient in their reading of the material and dramatically improve usage of highlighting compared to other digital books.

Visually speaking, we strove for a simple and elegant style. We used Jacob Nielsen's research into readability. Therefore, the headline of the copy is quite narrow and the leading is quite large making it easier to read than most online environments. The smaller headline allows for generous margins on both sides of the page which provides plenty of room for larger figures and tables.

For the UX, we knew we needed to leave many of the navigational elements in physical books behind. We began by completely abandoning the idea of page numbers (realizing that they were irrelevant in a digital environment) and, instead, broke the book down into chapters, major sections and subsections. This breaking down into logical sections helped students understand how what they were reading fit into the larger scheme



of the content. We repurposed an ebook platform owned by our parent company which we felt did an excellent job of breaking textbook into these logical chunks. It was also built in such a way that we could apply our own UI and additional functionality on top of it without too much rework.

After realizing we didn't need to use the physical book as a metaphor, we added a variety of handy features. First, rather than have a glossary, key terms became links within readings that launch small definitions that appear within the page. Those key terms were aggregated to the end of the chapter and presented as key term flash cards and small matching quizzes. Similarly, instead of having answers to selected questions added as an appendix that students would have to jump to, we added a small bar to each question with an answer that toggled it on and off. We scoured our parent publishing company for multimedia and decided that instead of linking out to various multimedia assets (as most competing ebook platforms did), we would embed the assets directly into the page, right at their point of use. In our research, we found that students were highly unlikely to log onto ancillary websites for course materials, but would more frequently use the pedagogically valuable multimedia assets if they were embedded directly in the context.

Time and time again, we had found that students had a hard time navigating through and keeping track of where they were in an eBook. First, we added chapter-level table of contents (which we called "Chapter Outline") to the first page of each

## Aplia Text: The Process and Solution (continued)

chapter. This helped students make a mental map of how the different sections of the chapter related to one another.

Next, we started thinking about how we could visually display where students were in their readings. After multiple iterations on the problem, I was inspired by Tufte's concept of small multiples and created an innovative flipbook navigation widget. Inspired by the "album view" in iTunes, it allowed students to flip through thumbnails from the book by scrubbing through the pages. "Stacks" of pages on the left and right side gave students a sense of where they were in the chapter. Rolling over individual pages revealed key concepts found on that page. Beyond the textbook component in Aplia, we decided to leverage it throughout Aplia to enable students to jump in and out of their textbook while they were doing their homework. Beyond conceptualizing and designing the widget, I also built the Flash front-end and defined the XML schema that our developers used to power it.

Again, we had seen a huge disparity between use of highlighting in physical book and digital books. When we looked into other eBook platforms we saw that either entire blocks of text are highlighted via a toggle (i/e highlight the entire paragraph or sentence), or required a significant number of

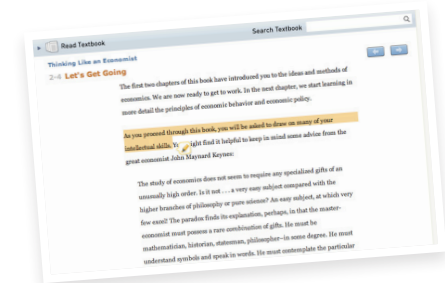


clicks and decisions to turn on the highlight tool. Instead, we wanted something that was extremely granular and fast.

I realized that simply selecting text was an implicit statement by the user that they found that text important. So, rather than asking them to highlight that entire paragraph or activate certain highlighting tools, we could simply offer them the option to highlight whenever they selected text. Inspired by radial menus, I designed a simple interface that pops up a button a few pixels to the right of the mouse whenever the user highlights text.

Once we had done some initial user testing on my mockups, I created a proof of concept using JavaScript. An initial concern from our QA team and engineers was that we wouldn't be able to build something like this that was cross-browser compatible. My proof of concept laid those fears to rest.

We also realized that we could improve highlights in physical books by aggregating all the student's highlights into one place. We decided to aggregate them all into the end of chapter material. Within the end of chapter page, we simply listed all of the highlights from that chapter along with links back to the page. We also have a link to a page where we list all the paragraphs that contain highlights in order to help students review.



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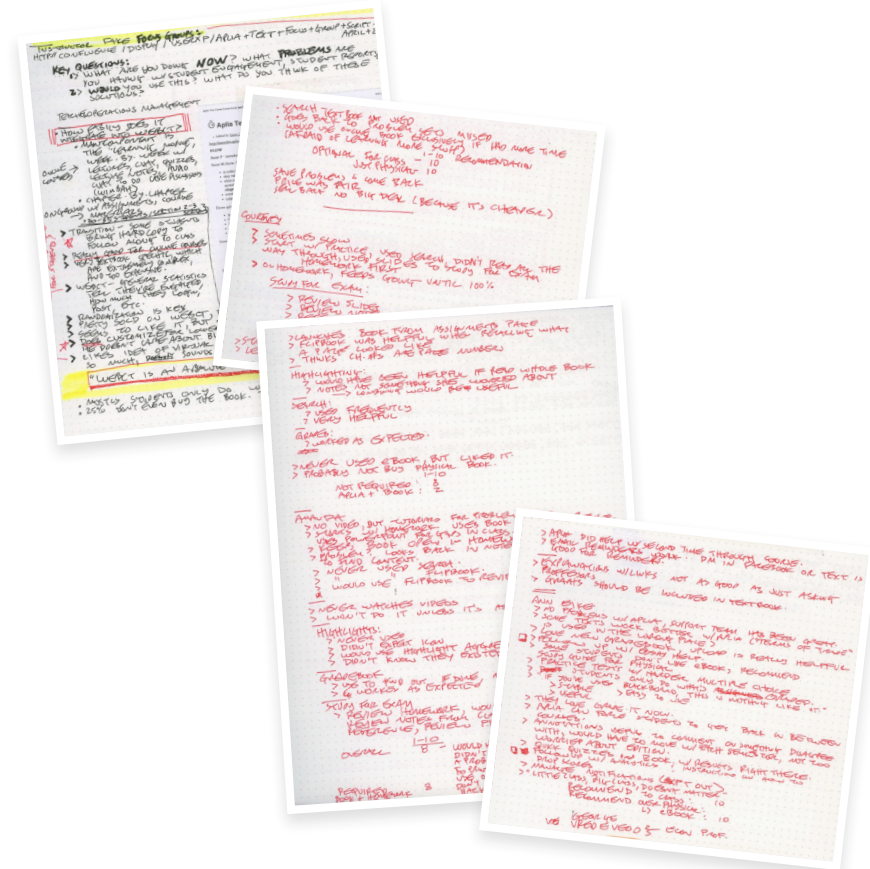
## Aplia Text: Results

After a soft launch in summer 2009, Aplia Text was launched as the eBook solution for 24 Cengage textbook titles with over 100,000 students fall 2009. Initial response from both students, instructors and internal stakeholders was extremely positive and we saw a huge increase in usage the following year. Iterative improvements were made in the design based on feedback we received in post-launch interviews.

In research done by other members of our parent company, Aplia Text was consistently ranked as the best eBook offering by students. Students also ranked the flipbook navigation widget as one of their favorite features within all of Aplia.

Usage for highlights in Aplia Text was well beyond our expectation. We saw 100x more usage of highlights than any other eBook we have usage data for. In our followup surveys and research with students, highlights ranked near the top of favorite features.

A year later, we scaled our title development process and greatly increased the number of titles offered.

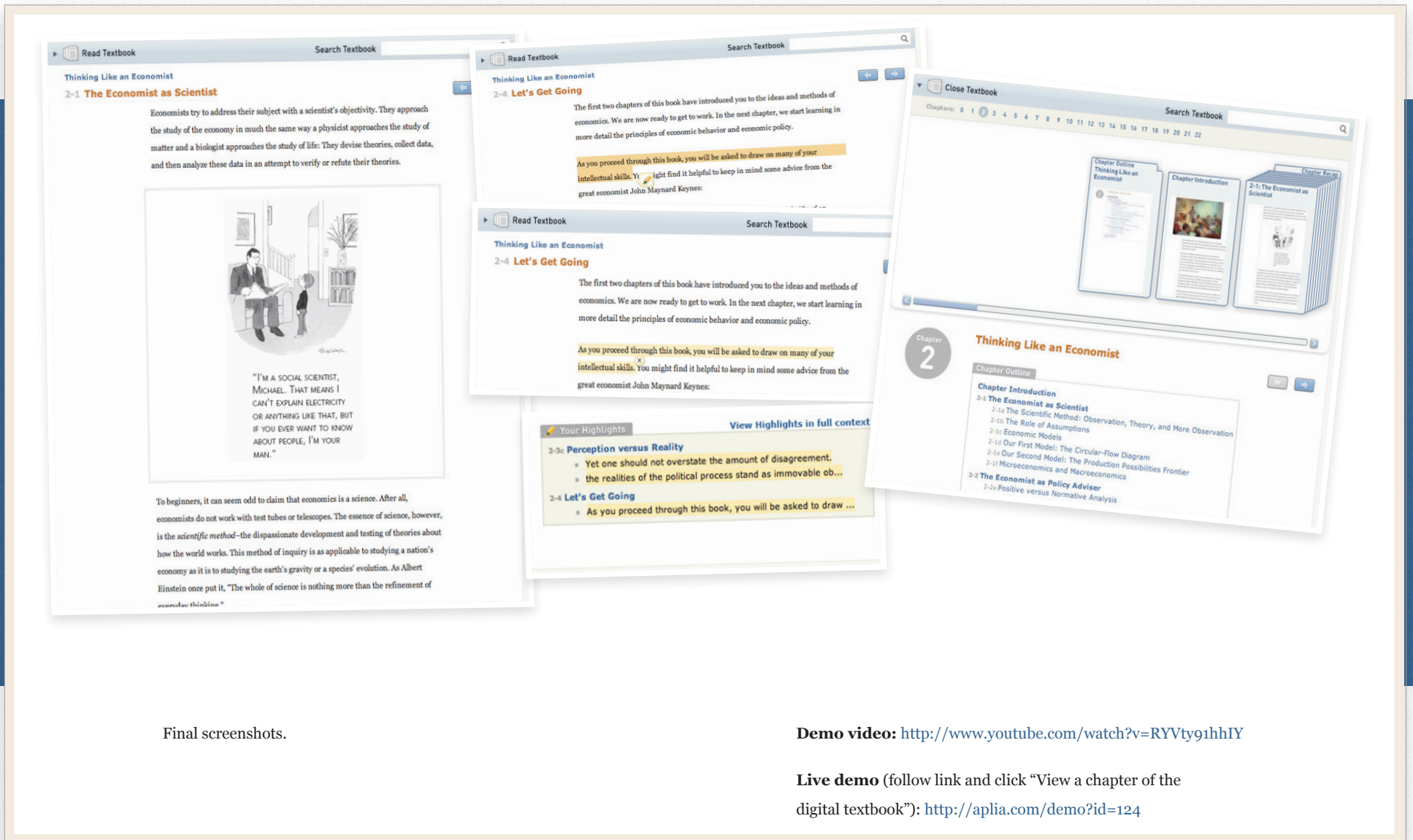


Notes from followup interviews.



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## Aplia Text: Results



Final screenshots.

**Demo video:** <http://www.youtube.com/watch?v=RYVty91hhIY>

**Live demo** (follow link and click "View a chapter of the digital textbook"): <http://aplia.com/demo?id=124>



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## Aplia Text: Process



Contents Learning Plan Glossary Study Guide 90

### What Economics Is About

#### 1-2a: Opportunity Cost

As noted earlier, people must make choices because scarcity exists. Because our seemingly unlimited wants push up against limited resources, some wants must go unsatisfied. We must therefore *choose* which wants we will satisfy and which we will not. The most highly valued opportunity or alternative forfeited when a choice is made is known as *opportunity cost*<sup>9</sup>. Every time you make a choice, you incur an opportunity cost.

In The News: Opportunity Cost in Iraq's Oil Revenues  
How does Saddam Hussein's past misuse of opportunity cost in oil revenues impact Iraq's present and future?

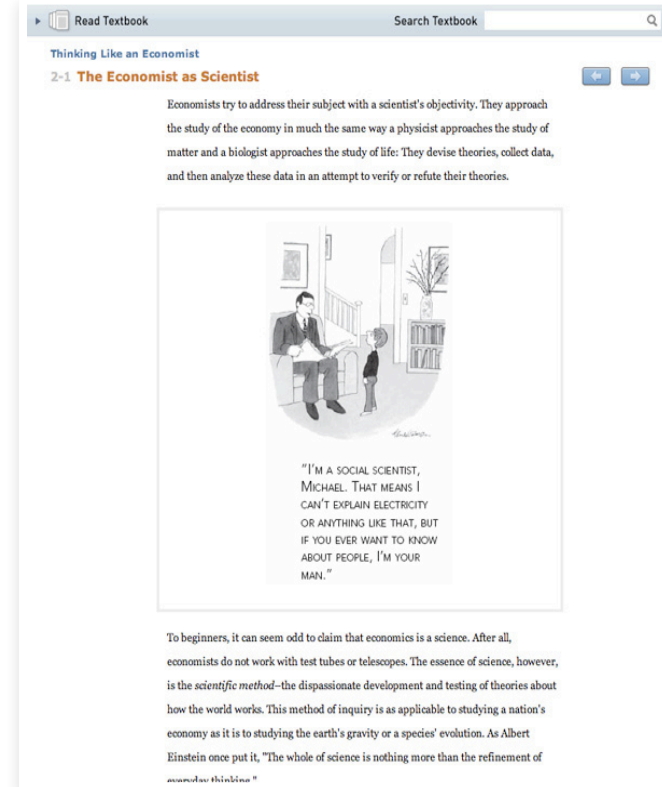


6:46 / 1:40

**LEARN More**

[Economics 24/7: Why LeBron James Isn't in College](#)

The resources owned by a business are its assets. Examples of assets include cash, land, buildings, and equipment. The rights or claims to the assets are normally divided into two principal types: (1) the rights of creditors and (2) the rights of owners. The rights of creditors represent debts of the business and are called *liabilities*<sup>9</sup>. The rights of the owners are called *owner's equity*<sup>9</sup>.




Read Textbook Search Textbook

### Thinking Like an Economist

#### 2-1 The Economist as Scientist

Economists try to address their subject with a scientist's objectivity. They approach the study of the economy in much the same way a physicist approaches the study of matter and a biologist approaches the study of life: They devise theories, collect data, and then analyze these data in an attempt to verify or refute their theories.



"I'M A SOCIAL SCIENTIST, MICHAEL. THAT MEANS I CAN'T EXPLAIN ELECTRICITY OR ANYTHING LIKE THAT, BUT IF YOU EVER WANT TO KNOW ABOUT PEOPLE, I'M YOUR MAN."

To beginners, it can seem odd to claim that economics is a science. After all, economists do not work with test tubes or telescopes. The essence of science, however, is the *scientific method*—the dispassionate development and testing of theories about how the world works. This method of inquiry is as applicable to studying a nation's economy as it is to studying the earth's gravity or a species' evolution. As Albert Einstein once put it, "The whole of science is nothing more than the refinement of *common thinking*."

This is the original platform we chose to build ApliaText on top of. Breaking the content into logical chunks rather than by physical book page number was one of the things we were looking for in a starting point. I also liked the fact that this product already had an established workflow to move content from InDesign

files (used for the print book) into XML. While the output HTML was anything but clean or semantic, the underlying XML was extremely semantic and easily mapped the HTML entities and classes we knew we would need (final design on the right).

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## Aplia Text: Process



### Verdana for Body Copy

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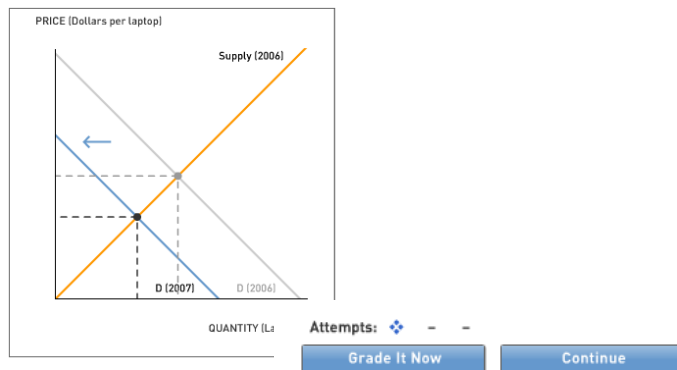
### Din for Figures

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Adjust the graph to illustrate your answer by showing the

Tool tip: Click and drag one or both of the curves. Curve: it snaps back to its original position, just try again and dr

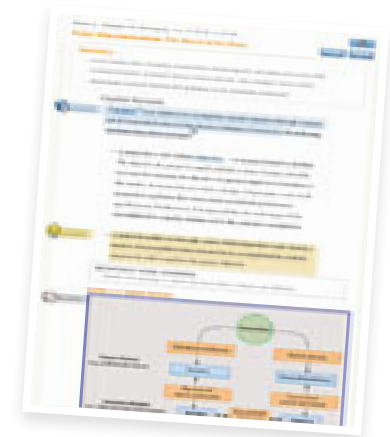
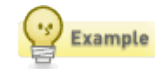
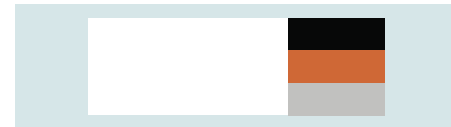


Aesthetically, I wanted to thread a needle. Aplia already had a strong brand, but the font used in the Flash-based homework (Verdana and Din) didn't convey the feel I wanted the book to have (and Din wasn't web-safe). So, I used the branding from Aplia (left) as a launching pad for our own look and feel.

### Verdana for Headlines

### Georgia for Body Copy

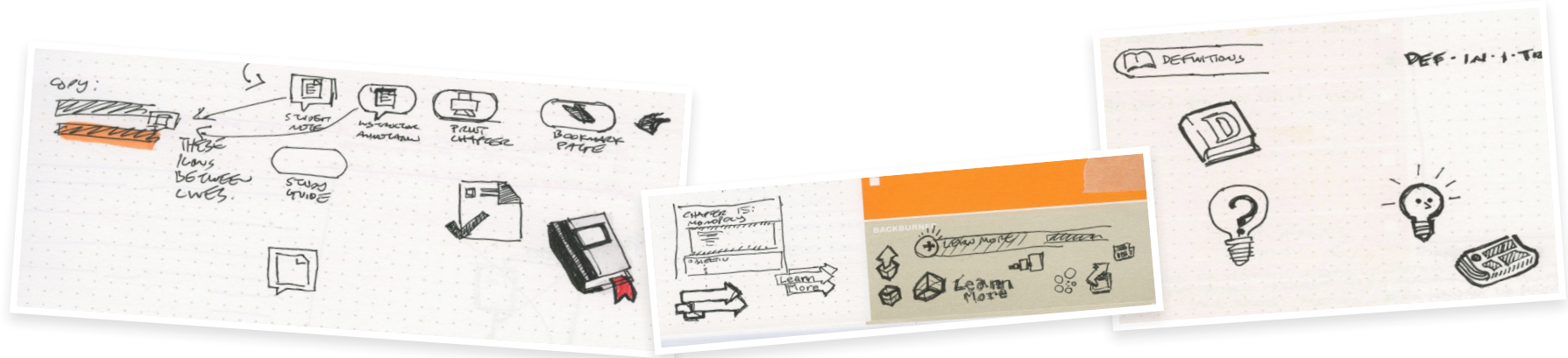
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Typeface, size, leading and color were all informed by a series of readability studies Jakob Nielsen had recently released. I even went so far as developing a series of icons to differentiate content. However, because of how they conflicted with book-specific styling elements (far right), these ultimately had to be dropped.

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## Aplia Text: Process



 Your Highlights

 Print This Chapter

my, but that  
ality goes at

 Getting the Big Picture

 Example

 Key Term

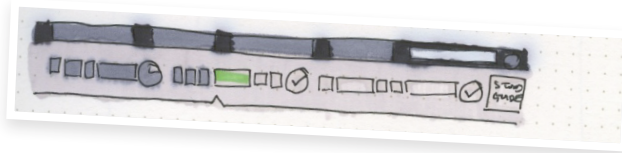
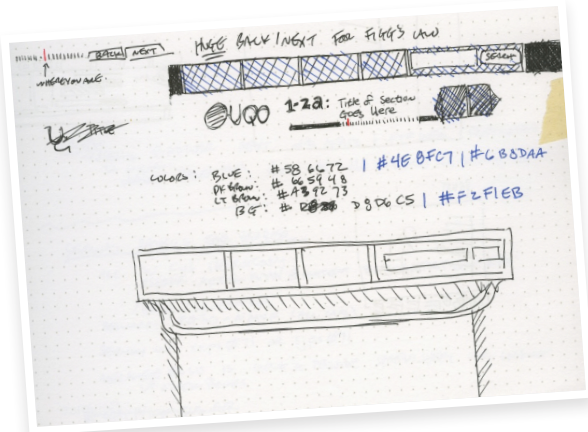
 Key Term Matching

Icon sketches and final results



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## Aplia Text: Process



Initially I wanted to integrate the Aplia homework into the book. Students would read some of the content and then complete a short assignment and repeat the cycle through a chapter. The pages would be color coded (an idea I picked up from a Tufte seminar) based on which sections the student needed to review.

All Assignments Table of Contents Search

Chapter 3: Project Management Concepts - due 12/08/08

100% 75% 45%

### 3-6: The Peripheral Nervous System Connects the Brain and Spine

BACK PAGE NEXT PAGE

STUDY GUIDE PRINT CHAPTER

Summary:

Lorem ipsum dolor sit amet, consectetur adipiscing elit, sed diam nonummy nibh euismod tincidunt ut laoreet dolore magna aliquam erat volutpat. Exercitation ullamcorper suscipit lobortis nisl ut aliquip ex ea commodo consequat.

#### Flicker Fusion, Persistence of Vision and Interlace

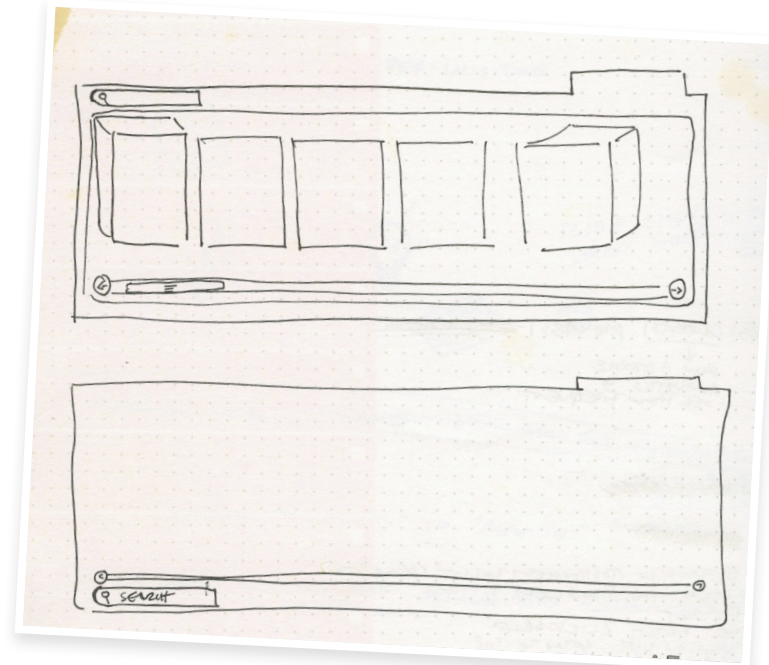
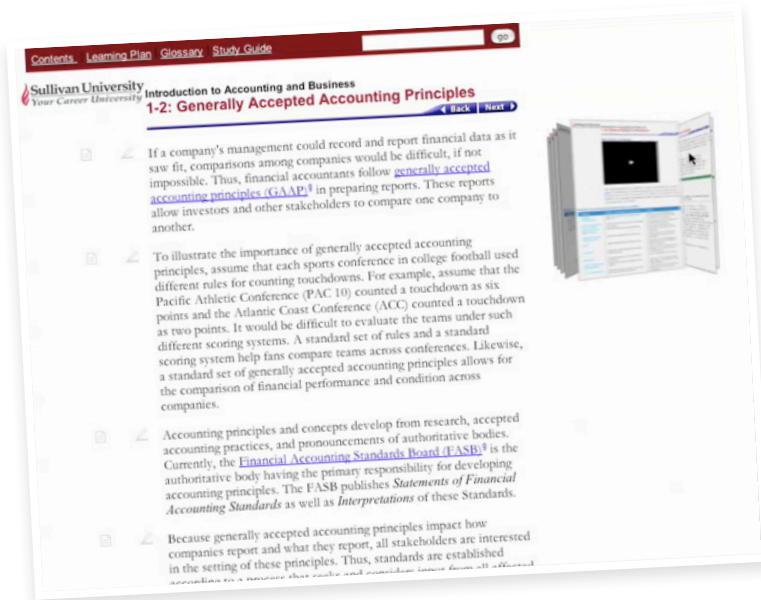
A **project** is an endeavor to accomplish a specific objective through a unique set of **interrelated tasks and the effective utilization** of resources. The following attributes help define a project:

- A project has a well-defined **objective** –an expected result or product. The objective of a project is usually defined in terms of *scope, schedule, and cost*. For example, the objective of a project might be to introduce to the market—in 10 months and within a budget of \$500,000—a new food preparation appliance that meets certain predefined performance specifications. Furthermore, it is expected that the work scope will be accomplished in a *quality manner* and to the *customer's satisfaction*.
- A project is carried out through a series of *interdependent tasks*—that is, a

However, once we analyzed how instructors assigned homework and readings (they often jumped around in the book) and how students read content (they rarely read linearly), we realized this model would become increasingly cumbersome.

# MFA Review: Project One

## Aplia Text: Process



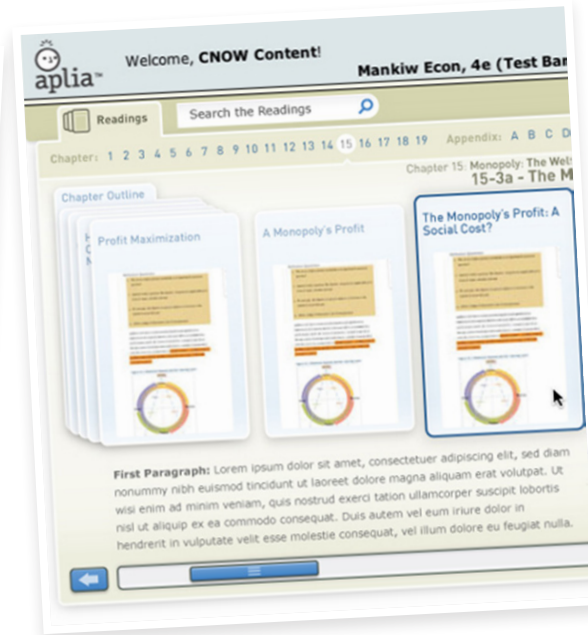
From the previous iteration, I really liked how one got a sense of where they were in a given chapter. During a team brainstorming session, we recalled how students often flipped through pages. We realized this might make an excellent navigational widget. I quickly mocked up an animated version in After Effects (far

left) and showed it to the team. We all agreed it was the direction we wanted to head. I began iterating on this “flipbook” concept. I wanted the small thumbnails to carry meaning, so I played with highlighting passages based on the content type. I liked it conceptually, but it was too much visual noise.



# MFA Review: Project One

## Aplia Text: Process



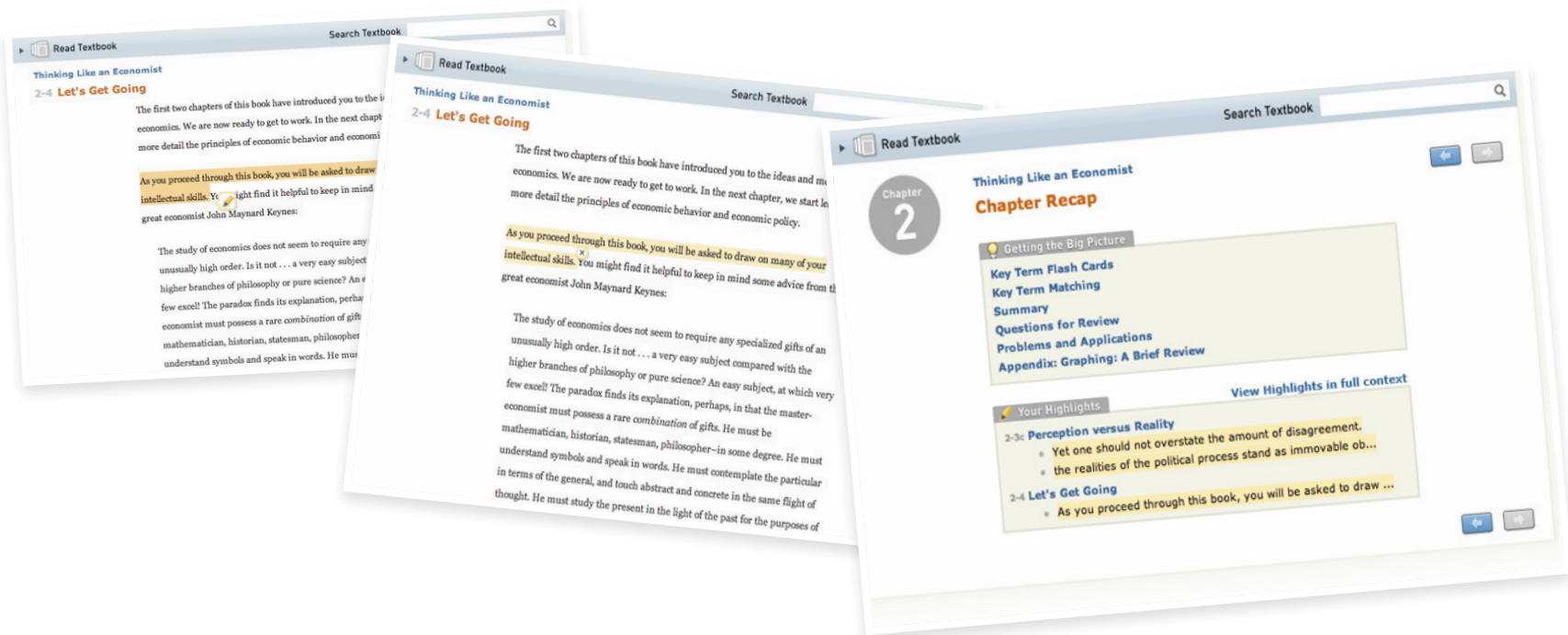
Next, I started playing around with using rollover to reveal more information about a given page (such as the first paragraph). After discussing it with one of our developers, we came up with a way to use the underlying XML to semantically extract key phrases from a given page and display them as a summary.

Aesthetically, you'll see that the design continued to evolve and simplify.



## MFA Review: Project One

# Aplia Text: Process



As I had mentioned, one of the primary things we saw students do in their physical books was highlight. However, when we looked at usage on other ebook platforms, we saw very few students using their highlight features. After talking to students and trying it out ourselves, it became obvious to me that the problem was a UX one. It simply was a pain to highlight in these other platforms.

Inspired by radial menus from video games, I came up with the concept of displaying the option to highlight once students had selected text. Interestingly, about a year later, Apple released an update to iOS that used a similar concept for copy/paste. We also aggregated all of a given chapters' highlights into one place, essentially enabling students to build their own study guide.

# MFA Review: Project One

## Aplia Text: Process

The screenshots illustrate the Aplia digital textbook interface. The largest screenshot on the left shows a page titled "Thinking Like an Economist" with the section "2-1 The Economist as Scientist". It includes a paragraph about economists' objectivity, an illustration of a man and a child, and a quote from Michael: "I'M A SOCIAL SCIENTIST, MICHAEL. THAT MEANS I CAN'T EXPLAIN ELECTRICITY OR ANYTHING LIKE THAT, BUT IF YOU EVER WANT TO KNOW ABOUT PEOPLE, I'M YOUR MAN." Below this is another paragraph about the scientific method. Other screenshots show sections like "2-4 Let's Get Going" with introductory text and a quote from John Maynard Keynes, a "Your Highlights" section with bullet points, a chapter overview page for "Thinking Like an Economist" listing sections like "2-1a The Scientific Method" and "2-2 The Economist as Policy Adviser", and a "Close Textbook" view showing a chapter navigation menu.

Final screenshots.

**Demo video:** <http://www.youtube.com/watch?v=RYVty91hhIY>

**Live demo** (follow link and click "View a chapter of the digital textbook"): <http://aplia.com/demo?id=124>