Ligatour

A Tour of Typography Over Time

https://github.uconn.edu/pages/gms20005/typography/

by Gideon Slife

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Contents

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Introduction

In my experience teaching design to undergraduates, I became convinced structured exploration was critical to learning design foundations. The concepts of design need to be 'played with' to learn. However, 'playing' within a design application is too unstructured to facilitate learning. Students need to be equipped with the appropriate guard rails—learning the building blocks of type—before moving on to Adobe's Creative Suite or other industry applications. To explore this hypothesis, I've built a proof-of-concept called Ligatour, a browser-based application that brings elements of play and exploration into the pedagogy of typography basics: https://github.uconn.edu/pages/gms20005/typography/

Some lessons involve more play than others, but interaction is crucial to all. In *history*-focused lessons, slideshows and mini-games illustrate concepts. In the *play*-focused lessons, an open-ended interaction that adds complexity gradually helps users understand the curriculum. Continually returning to the experiment creates a loop. Users gradually learn more about the actions they're taking as the lessons build on cognitive learning. The interactive nature of each lesson creates

a series of *active* 'playing' actions rather than *passive* 'reading' actions. Ultimately, because students engage and experiment with the concepts, they will gain a more profound understanding of typography than by simply reading about it.

Three lessons have been built in this prototype. The table of contents shows others lessons that could be built. The goal of Ligatour is to teach typographic concepts using interactive, self-guided learning rooted in the historical order and context of typography.

Pedagogical Philosophy

In developing the idea for Ligatour, I sought to accomplish two things: i) teach the history of typography and ii) teach the terminology of typography. In some respects, Ligatour would be similar to the first weeks of a Typography 101 course in which students learn the basics of typographic design. But Ligatour differs from typical Introduction to Typography courses by including and emphasizing the history of the art. When learning, a painter does not need to know the historical context of lapis lazuli. It was mined in the east, brought west to Europe, ground and formed into a powder, and mixed into a paint called ultramarine (considered the most glorious and complex pigment in the Middle Ages). Today, ultramarine is synthesized and the painting student is never the wiser. But for a student of typography, the at-times cryptic numbering and terminology deeply tied to the design system comes to us through 580 years of printing and thousands of years of the written word. To know why the slider in InDesign that changes the space between lines is labeled 'leading' requires a knowledge of type presses from Benjamin Franklin's day (the reason is the spacing was made from lead in the 18th century).

With my twin goals in mind, the first step was to consider the curriculum and the underlying education theory. My primary audience was college students, with a secondary audience of working professionals who need to understand concepts of typography for their projects. I began to study historical ideas of education and modern research into gameplay and interaction design as learning tools.

The primary focus of the study of education is the teaching of children and teen-

agers. Yet, *adult* education is constant and often unrecognized. Beyond formal instruction in colleges and universities, 'adult education' could apply to almost 5.2 billion people around the world (World Population Prospects 2019, 2019). Digital tools and methods, combined with existing theories of education, are particularly well-suited to adult education.

Malcolm Knowles's theory of andragogy (adult learning)[1] contains five parts—or assumptions—for learning:

1. Learners are self-directed.
2. The act of learning creates motivation.
3. Experience in life helps the learning process.
4. Learners have personalized goals.
5. Learners have immediate real-world application.

Jean Lave considered similar ideas in her work *Cognition in Practice*. To better understand how learning works, Lave looked at how people apply their knowledge in the real world. Her conclusion was that to teach concepts without considering the complexity of the material and its application is to misunderstand how human cognitive processes function. Lave states: 'Arrangements of knowledge are socially organized in such a fashion as to be indivisible' (Lave, 1988).

The five assumptions of andragogy synthesize neatly with the concept of anchored instruction, a theory Lave's ideas led to. In anchored instruction, learning is 'anchored' to a potentially real-world scenario that can generate several possibilities for examination, allowing for a richer learning experience. For example, the

1 Andragogy is an odd word etymologically. 'Andro-' is Greek, meaning 'man'. '-gogy' is adapted from the Latin 'pedagogy', perhaps with the assumption that because 'paedo-' means 'boy', '-gogy' must mean instruction or teaching. In fact, 'agogic' is metaphorical, as the Greek origins of the Latin phrase mean 'leading'. The word 'pēdagōgus' originally meant a slave who led boys to school. This meaning survives in the word 'demagogue' (literally 'people + leader'). Thus 'andragogy' has the literal meaning of 'man + leader', which is broader than the definition Eugen Rosenstock-Huessy used when he revitalized the German term in 1926 (Feringer, 1992).

scenario of running a bookstore could be presented to students. This anchor allows students to explore the issues of spatial math (space needed for shelves), financial and budgeting decisions, and planning decisions (shipping concerns and delays). Anchored instruction and andragogy share not only real-world application, but also learning to further motivation, and self-directed learning.

Ligatour applies these ideas of anchored instruction for adult learners in the subject of typography. At the earliest stage of learning *how* to design, 'playing' within a design application is far too unstructured to facilitate learning. Using the real-world history of design can anchor these new ideas and concepts and allow for self-directed, but constrained, exploration.

To support the ideas of andragogy and my two audiences (college students and working professionals), I decided each lesson should be limited to a single concept and require no more than ten minutes from start to finish. At this point, I wrote the lesson outlines and organized them into five major sections. Each bullet point under a section became a minor step within the application[2]. This sectioning is based on research done by cognitive psychologist George Miller in his paper *The Magical Number Seven, Plus or Minus Two*. Miller described how a human can keep about seven things in his or her head to process them. Lesson progression also was based on researching the approaches used by online education sites such as CodeAcademy, and Udemy, as well as and other online learning tools.

Now that I had a theoretical framework in place, I needed to write the curriculum for Ligatour. I gathered thirty syllabi from existing typography courses (found by limiting a Google search to PDFs on .edu sites). My research further included many required and recommended books from these syllabi.

In structuring the Ligatour curriculum[3], it was clear the lessons would fall into two categories: history-based or play-based. A play-based lesson would work like the following (using the example of typographic leading):

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2 See Figure 1.

3 See Appendix B.

1. On opening the lesson, a slider and a paragraph are presented to the learner. The only option is to move the slider. Doing so changes the leading of the paragraph, though the user may not yet know that terminology.
2. In the next step, the terminology is explained.
3. A second experiment is introduced, this time with the goal of improving the legibility of the paragraph. This experiment gives the user feedback.
4. After this second experiment, the historical context of leading is introduced, including a mnemonic device for remembering the term.
5. Finally, a third experiment introduces a secondary variable of type size, so a user can see how leading and type size interact.

Typically, play lessons follow this pattern:

1. A play experiment
2. Terminology is introduced, providing context to step 1
3. A play experiment with feedback
4. Historical context is introduced to give a grounding idea to the concepts
5. A play experiment with more variables

History-focused lessons use a similar five-step approach and employ anchored instruction to teach the history of aspects of typography. For example, the *Letterform Development* lesson teaches the invention of the alphabet. As users progress, they learn how Phoenicians used Egyptian hieroglyphs to develop a set of characters that corresponded to sounds. Learners can interact and trace the development of Egyptian to Roman characters, track the progression of trading boats to Italy, and see how letterforms are used—and transformed—around the Mediterranean Sea until they become recognizable forms.

Because andragogy requires that learning itself directs motivation and that goals for learning are personal, Ligatour has no tests, quizzes, or exams. Ligatour's users do not engage terminology and facts in a vacuum. At the end each lesson, a user

is provided with a bulleted summary of the concepts they've seen in the lesson. 'Learning'—if a user has understood, remembers, and can act on the material—is left up to the user. Anchored instruction combined with aspects of andragogy show that putting terminology and facts into a broader context help self-motivated learners learn. Ligatour provides context to typographic terms and design skills, thus fostering and enhancing the learning process.

Process

Code Process

In designing the Ligatour interface, I wanted to embrace the advantages of a digital medium. Ligatour had to be more interactive than flipping the pages of a digital book. There are many sources of inspiration for that apporach. I'll note two: First, an article on the internal combustion engine by Bartosz Ciechanowski, and the *New York Times* Interactive team.

Bartosz Ciechanowski writes articles explaining applied physics using interaction design. His article on the internal combustion engine is a prime example of the useful aspects of interactive technology. The article is illustrated with dozens of 3D renderings of different parts of the engine. They can all be rotated, paused, or changed in some way so the reader can better understand how the engine works. A slider controls the speed of an animation, which a user can pause, rotate, and then play again. Using this method, Ciechanowski explains every part of the engine from crankshafts, to combustion, to flywheels. The incredibly complex machine comes alive in the way a book would never be able to. Only working on an engine could have a similar effect.

The *New York Times* Interactive team has applied interaction to stories where a photograph, or map, or data chart would not be sufficient to communicate the ideas of the article. One of the best examples of this is an article on the 1921 Tulsa, Oklahoma race riots. The reader experiences a digital flyby of a recreated 3D downtown Tulsa. Details of inhabitants at the time of the massacre pop up over highlighted buildings.

The interactive addition to the story takes it from well-written journalism to an experience. I wanted Ligatour to help students experience typographic learning in the same way—more than a textbook could.

Coding Ligatour was done with an Agile methodology. Two key components of the Agile approach are early coding and continual improvement. Code projects often get bogged down in the early planning and documentation phases, while Agile advocates beginning early with minimum viable section of code, and working on continual quick iterations that result in growth over time. As the Agile Manifesto states, "Working software is the primary measure of progress." (What Is Agile Methodology?, 2020)

Following the Agile approach, I started with the *Leading and Texture* lesson, building the interaction of the range input changing the leading of a section of text. I chose this particular lesson because it was short, straightforward, and 'leading' is a perfect example of a typographic term that's easy to understand yet relatively unknown. The interaction element was relatively easy to replicate (it's essentially what InDesign gives a typesetter to change leading). Once the initial interaction was done, I started building the progression interaction and integrating the five-part lesson curriculum (p. 8) into the code. At this point, the interaction was bare-bones and without design (see design process below). Over time, I integrated design elements, as well as other elements that required more design-thinking such as the navigation. Other lessons, with their own customized interactive elements, were built out as well. At every point, the code grew out of the central idea of the individual interactive element.

Design Process

Ligatour was designed to do three things: i) support the pedagogical philosophy, ii) leverage the benefits of an interactive medium, iii) reinforce typographic concepts.

Supporting the pedagogical philosophy also meant leveraging the benefits of the interactive medium. A major part of Ligatour's development involved adding interactive tools[4]. I explored several ways to explain ideas using these tools. The inter-

4 See Ciechanowski's internal combustion engine and NYT Interactive, above.

active elements range from game-like sections to time-based maps through which a user can progress. Some interactions can be as simple as a draggable slider to change the leading of a paragraph,[5] or more complicated like a card match game.[6]

Reinforcing the typographic concepts meant not having ill-considered typography: few things could undermine my intentions as much as having a poorly typeset application. Therefore, being visually pleasing was crucial. But an even higher priority for the design to allow Ligatour's teaching content to be the focus. As Beatrice Warde said in her famous essay *The Crystal Goblet*, 'Type well used is invisible as type.' Ligatour uses Cormorant by Christian Thalmann for headlines, and Spectral by Production Type for body copy. Both serif typefaces are designed for text on screens, with Spectral in particular being designed for immersive reading.

Once the lessons and interactions were designed, I focused on researching design examples related to content organization. The research material included more than two dozen print books, both fiction and nonfiction (content organization can be substantially different depending on the subject). My print and digital design research led to the organizing principles of user experience design. There is no better resource for this research than work done by Nielsen Norman Group (NNg). Since my work on Ligatour is entirely digital, I found partiucularly helpful an NNg article on the subject *How People Read Online: New and Old Findings*, covering thirteen years of studies in this area.

Since the historical aspect of Ligatour's lessons are a defining characteristic, the lessons are organized chronologically: each section represents an era of typographic invention, such as 'Western Writing Origins, 4th - 1st century BC' or 'Written Language Spreads, 100 BC - AD 500'. My headers and lesson titles contain the central idea—if users want more information, it is available in the lesson. Each header and lesson is numbered: headers use Roman numerals while lesson numbers are Arabic. This way, a user can remember they were on Section IV, lesson 4, without having to remember the longer name of that lesson. Headers also became collapsible

5 See the lesson *Leading & Texture*.

6 See the lesson *Early Letterform Development*.

accordions—i.e., when closed, only the Roman numeral and section header were available. When open, a user can also see the dates of the section and the lessons under that section.[7]

I then turned to the in-lesson navigation. Because of the five-step progression (p. 8), I had a good starting place for my in-lesson navigation. I didn't need to rewrite each lesson or find natural breaks in content to add headers. Further research at this point showed it is important to account for the ideas of primacy and recency. Users remember both the first and last items in a list more easily than the other items (Murphy et al., 2006). I didn't want users to be able to skip around within lessons. Each lesson takes about 10 minutes to complete, and each is written to be read in a single sitting. The five sections build on each other—jumping to a future section negates the lesson design. I wanted a navigation that would 'unlock' links as the user progressed. A user who finishes Section A should be able to navigate back to the start of Section A easily, but not to Section C.

The designed menu is available at all times within the lesson because it sticks to the top of the viewport as the user scrolls. When open, the first link (primacy) is always 'Return to lessons'. The user always knows how to get back to the main table of contents. Next is the list of 4-5 section titles within the lesson. Icons denote if a user has finished a section. Finally, the last line (recency) is the name of the lesson followed by the current section the user is in. These section titles are indicated by orange headers in the content as well.[8] When the menu is closed, this final line is the only content seen, along with a minimized version of the set of circles, so the user has clarity on how much content is yet to be completed within the lesson.[9]

User Testing

User testing is a critical part of system and interface design. I worked with Profes-

7 See Figure 2.

8 See Figure 3.

9 See Figure 4.

sor Samantha Olschan and her Design Lab 1 undergraduates to test lessons. This course was the student's introduction to typography, so it was an ideal scenario to present Ligatour and complete user testing with the primary audience. Professor Olschan presented the Ligatour lessons to her students on a Monday, and I visited the class on a Wednesday to facilitate the questionnaire. Students filled out a Google Forms review of the data[10].

I asked three questions about the lesson material. Seven out of twenty-six students got all three answers correct, or about 25%. If guessing randomly, there was a 2% chance to select all three correct answers. Three out of twenty-six students didn't get a single answer correct, or about 12%. If guessing randomly, there was a 40% chance not to get a single answer correct.[11] [12]

I asked three questions about the format of the content. 65% of students said they learned best with an interactive app (as compared to a lecture, reading, or video). 96% of respondents said they preferred an interactive format to a textbook, while 65% said they preferred an interactive format to a video.[13]

Finally, I asked the students if they had any issues using Ligatour. Nine out of twenty-six students noted issues, with the most common issues being progression (3) and accessibility (2). Notably, this feedback was gathered prior to design of the navigation and progress indication (p. 13) and well as prior to the accessibility work (below).

I have reason to believe some undergraduates may have reviewed only the first lesson. The question about the first lesson's content was answered correctly by 73% of respondents, while the question from the final lesson was answered correctly by 54% of students. In a more substantial study, lesson links and questions should be

10 For the full dataset, see Appendix C.

11 Professor Olschan and I both noted to the students that reviewing Ligatour wasn't for a grade. I expect if it was, these results would improve.

12 See Figure 5.

13 See Figure 6.

randomized. Additionally, I would need a control group to gauge any improvement as compared to reading a textbook or watching a video.

Accessibility

Accessibility was a high priority during the development of Ligatour. It's easy to write code that becomes inaccessible to a segment of users. A blind user may need a screen reader[14], for example. If an image contains text, many screen readers can't read it. Other users may have vision issues or neurodivergent conditions that make it difficult to read and understand content. Throughout my process, and especially toward the end, I thoroughly audited Ligatour to find accessibility issues and resolve them.

As accessibility was a primary concern during development, HTML and subsequent styling was kept semantic and clean. For example, very little sizing or spacing was set using pixel sizes. Instead, text sizing was set to relative-length units. Making careful use of each element's semantic use[15] means screenreaders can correctly interpret context.

Ligatour also has an accessibility panel. In this area, I had planned for the user to be able to change the typeface of the app and font size, enable a high contrast mode, and print the lesson. After further research into font size accessibility, I dropped the font resizing option. All modern browsers allow the user to set a font size preference, and it's better to inherit the user's browser setting. Instead of coding this part of the panel, I made edits to the base font settings to better inherit the browser sizing.

On the panel, users can pick between the default typeface (a serif face), OpenDyslexic (a typeface developed to be more legible for dyslexic users), Lato, and Verdana (both sans-serif faces). Many users with dyslexia prefer Verdana to OpenDyslexic

14 A screen reader is software that audibly 'reads' on-screen text out loud.

15 All HTML is coded using tags called elements. Many elements are semantic, meaning that their use implies something about the contents of the element. For example, links inside the <nav> element would be expected to be navigation for the site or a section of the site.

(Rello & Baeza-Yates, 2016), but giving the user the option for font plus the sizing will allow them to set a comfortable alternative to the default.

The Ligatour application is fully readable using a screen reader for users with low vision, blindness, or mobility concerns. All images and videos have alt tags or caption descriptions, so any data communicated in a visual medium is also accessible to the screenreader. Semantic titles are used to order the document. A screenreader-only link sits at the top of the document so users can navigate to the accessibility panel. Additionally for these users, high contrast mode can be toggled on to add a more contrasting styling to elements on the page. The design changes to ensure the application passes the WCAG AAA rating for contrast (7:1).

In the accessibility panel, the "Print lesson" button helps neurodiverse users who may not want to have elements revealed as they progress, or who may be stuck in a particular area. It displays the entire lesson at once, then brings up a print dialog. In the printed document, the activity elements of the lesson are removed as they would be useless in printed form.

The entire application is usable by keyboard navigation for users with vision or mobility concerns. Focused elements are styled to clarify to users what is selected. Users can use focus to navigate in the application as well as use keyboard arrows in certain interactive areas. A mouse or pointer isn't required to interact with the application.

Conclusion

Muriel Cooper, book designer and first design director of MIT Press once said:

> *Designers know a lot about how to control perception, how to present information in some way that helps you find what you need, or what it is they think you need. Information is only useful when it can be understood.*

'Information is only useful when it can be understood' is the guiding idea that led me to create Ligatour. Typography is a complex field with complicated terminology and a branching history.

At this point, Ligatour is a minimum-viable prototype, and as such, further iterations with usability testing are needed to explore learning interaction design. Moving Ligatour to a more advanced state would require research and curriculum planning from curriculum designers. In addition, robust content management system would be necessary to organize content for these designers. From the user's side, it would be necessary to build a system of saving progress or states using an account management and login process.

The initial research and design for Ligatour could also branch out to areas beyond a typography learning application. This research and design philosophy could be applied to different types of learning applications or to other content-organization needs.

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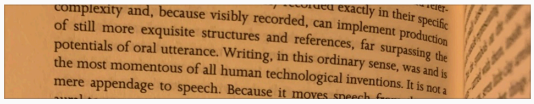
APPENDIX A

Figures

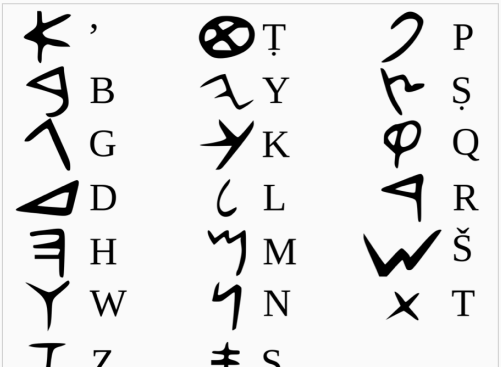
H1 Early letterform development and evolution

: : This is integrated into a web page! : :


complexity and, because visibly recorded, can implement production
of still more exquisite structures and references, far surpassing the
potentials of oral utterance. Writing, in this ordinary sense, was and is
the most momentous of all human technological inventions. It is not a
mere appendage to speech. Because it moves speech

Ong, Orality and Literacy

1. Intro: **Video?**
   - The English alphabet is 26 symbols
   - Our letters correspond to sounds, in what is called a phonemic language (each character is a sound)
   - First writing is 3500 BC
   - Some of the first writing is pictographic, like Egyptian heiroglyphs - 3000 BC
     - A picture of a bull means 'bull', or more complex meanings, like 'strength', or even 'spirit'.
     - The word for "ox" in Proto-Sinaitic language was "aleph".
   - Over time, these pictograms change meaning and their forms simplify
2. Exercise: **Slider to show progression over time**
3. Explain: early letterform development – Phoenician
   - The first alphabet comes about 1500 BC
   - **Phoenicians develop 20 characters**, rather than the hundreds of characters of Proto-Sinaitic languages.
   - These characters represent consonant vowels were implied in the writing.



   - The ox head is simplified, and becomes turned.
   - It retains the name "aleph", but instead of an ox, it typically represented a glottal vowel.
   - It is the first character in the alphabet.
4. Exercise:
   - Phoenecian alphabet matching game?
5. **History of the consolidation of Rome**
   - The trade routes of the the Phoenicians comes to the Aegean Sea, where the Greeks adapt the Phoenician letters to their language around 720 BC. The first two letters of Greek are "alpha" and "beta".
     - At this point, the Greek add something major to the alphabet– vowels.
     - Notably, the character for glottal stop ' is adapted to an "a" sound and becomes alpha, the first letter of **the Greek alphabet**.

Figure 1: Ligatour's written curriculum prior to implementation.

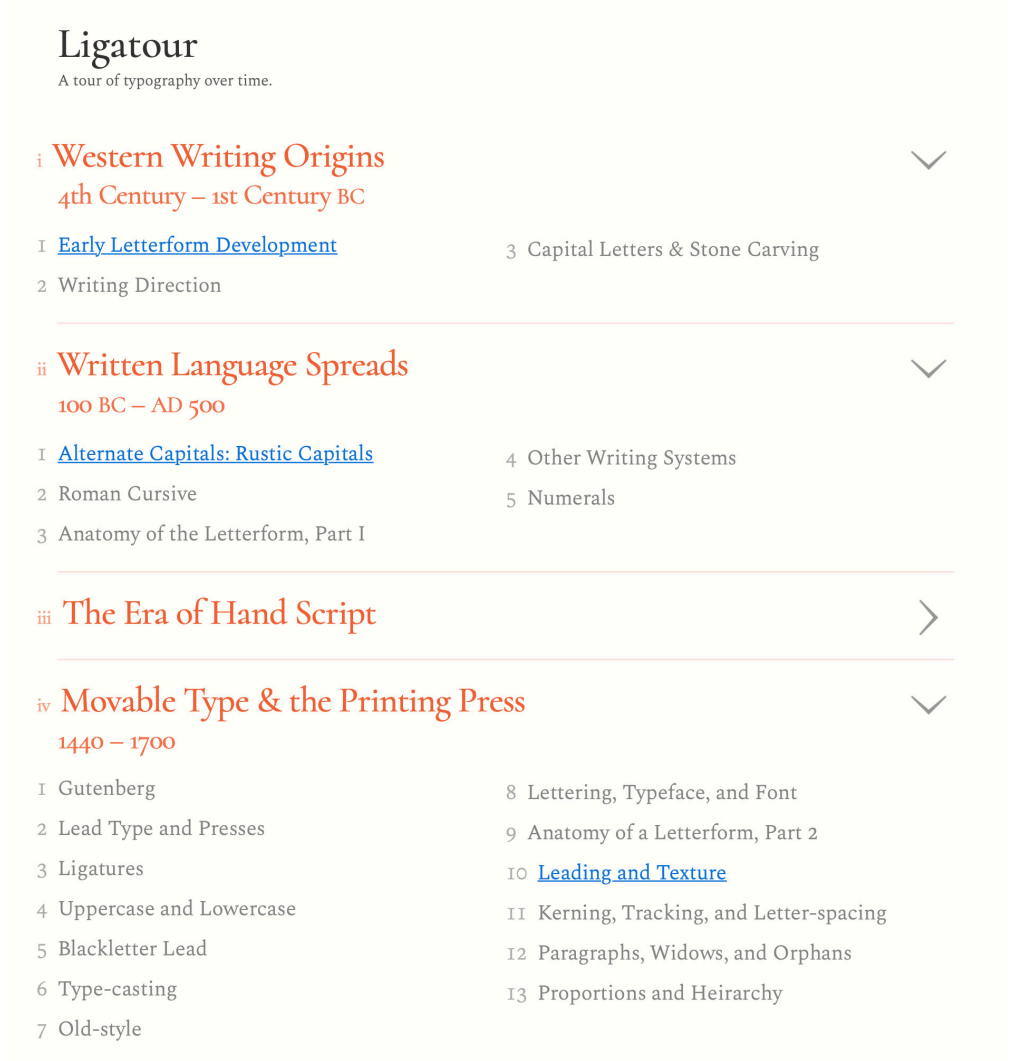


Figure 2: Ligatour's Table of Contents

Figure 3: Ligatour's in-lesson navigation open.

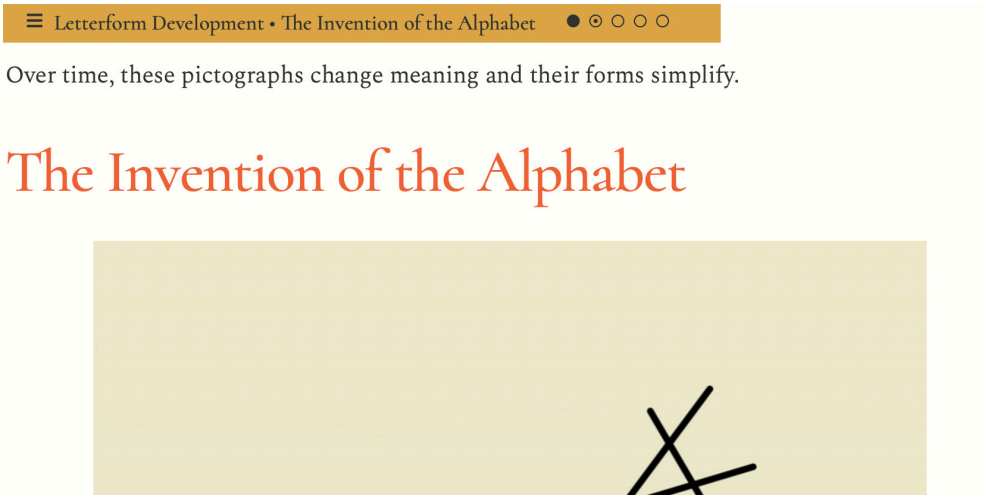
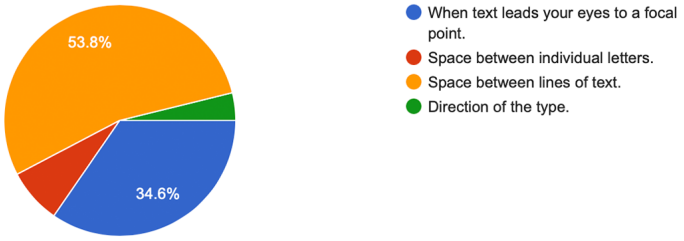


Figure 4: Ligatour's in-lesson navigation closed.

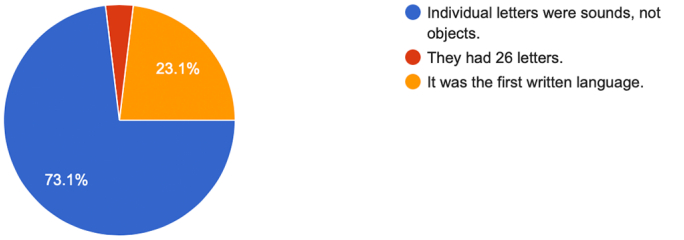
What is leading?

26 responses



Why was the Phoenician alphabet an important development?

26 responses



Which alphabet is closest to our modern English alphabet in terms of development?

26 responses

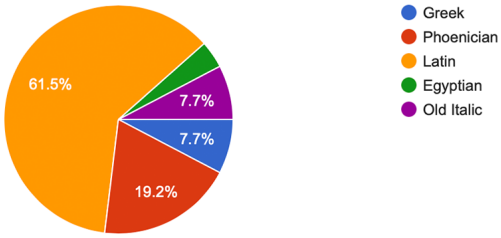
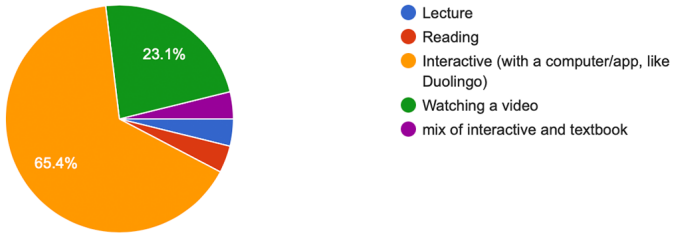


Figure 5: Student answers on curriculum questions. For full data, see Appendix C.

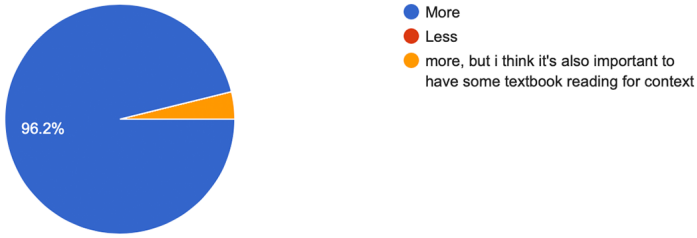
How do you think you learn best?

26 responses



Did you enjoy the interactive elements more or less than reading a textbook?

26 responses



Did you enjoy the interactive elements more or less than watching a video?

26 responses

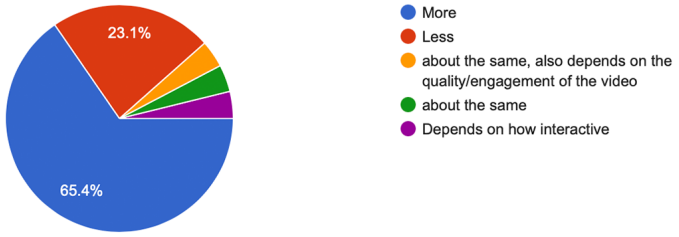


Figure 6: Student answers on content format. For full data, see Appendix C.

APPENDIX B

Ligatour Curriculum

Lessons in **boldface** were developed for the prototype.

The Origins of Western Writing

4th Century - 1st Century BC

- **Early letterform development and evolution**
  - Phoenician to Roman
- Writing direction
- Capital letters and stone carving

The Spread of Written Language & Transition to Modern Forms

100 BC - 500 AD

- **Alternate capitals: Rustic capitals**
- Roman cursive
  - Ligatures
- Anatomy of the letterform, pt 1.
  - Stroke
    - Stem & spine
    - Arms & legs
    - Cross-bar vs. cross-stroke
    - Ear
    - Tail
    - Terminal
  - Serif
    - Barb & beak
    - Bracket
    - Finial
    - Spur
  - Apex / vertex & crotch
  - Bowl vs. counter
    - Shoulder
  - Baseline & x-height
- Other writing systems (Chinese)
- Numerals
  - Upper & lowercase numerals

The Era of Hand Script

500-1400

- Uncials & half uncials
  - Bicameral writing system
  - Magiscules & minuscules
- Grids & grid systems
  - Margin
- Carolinian minuscules

- Blackletter
- Italian script
  - Italics

Movable Type and the Printing Press
1440-1700

- Gutenberg
- Lead type and presses
  - Ligatures
  - Uppercase & lowercase
  - Blackletter lead
- Type-casting
- Old-style
- Lettering / Typeface / Font
- Anatomy of the letterform, pt. II
  - form / counterform
  - ascender & descender
  - ascender, descender, and cap height
  - Em & en
  - link & loop
  - Stress
  - Swash
- **Leading & texture**
- Kerning / tracking / letter-spacing
- Paragraphs, widows, and orphans
- Proportions & heirarchy

Innovations and Refinements
1700-1900

- Caslon & Baskerville
- Transitional
- Modern
- Display face
- Boldface
- Egyptian
- Sans-serif

Rise of Sans-serif and the Digital Era
1900-Today

- Modernism
- Gill, Renner, Frutiger
- Digital typography
- Variable typefaces

APPENDIX C

User Testing Data

What is leading?	Why was the Phoenician alphabet an important development?	Which alphabet is closest to our modern English alphabet in terms of development?	How do you think you learn best?	Did you enjoy the interactive elements more or less than reading a textbook?	Did you enjoy the interactive elements more or less than watching a video?	Did you have any issues with the app lessons? If so please explain.
Space between lines of text.	Individual letters were sounds, not objects.	Latin	Interactive (with a computer/app, like Duolingo).	More	More	
When text leads your eyes to a focal point.	It was the first written language.	Greek	Interactive (with a computer/app, like Duolingo).	More	Less	
When text leads your eyes to a focal point.	Individual letters were sounds, not objects.	Latin	Watching a video	More	Depends on how interactive	
Space between lines of text.	It was the first written language.	Latin	Interactive (with a computer/app, like Duolingo).	More	More	
When text leads your eyes to a focal point.	They had 26 letters.	Phoenician	Interactive (with a computer/app, like Duolingo).	More	More	I had accessibility issues.
Space between lines of text.	Individual letters were sounds, not objects.	Latin	Interactive (with a computer/app, like Duolingo).	More	More	
When text leads your eyes to a focal point.	It was the first written language.	Greek	Watching a video	More	Less	
Space between lines of text.	Individual letters were sounds, not objects.	Latin	Reading	More	Less	
When text leads your eyes to a focal point.	Individual letters were sounds, not objects.	Latin	Watching a video	More	More	I had some issues progressing through the content.
Space between lines of text.	Individual letters were sounds, not objects.	Old Italic	mix of interactive and textbook	more but i think it's also important to have some textbook reading for context	about the same	

Space between lines of text.	Individual letters were sounds, not objects.	Latin	Interactive (with a computer/app, like Duolingo).	More	More	
Space between lines of text.	It was the first written language.	Phoenician	Interactive (with a computer/app, like Duolingo).	More	More	
Space between lines of text.	Individual letters were sounds, not objects.	Latin	Interactive (with a computer/app, like Duolingo).	More	More	
Space between lines of text.	Individual letters were sounds, not objects.	Latin	Interactive (with a computer/app, like Duolingo).	More	More	
When text leads your eyes to a focal point.	Individual letters were sounds, not objects.	Latin	Interactive (with a computer/app, like Duolingo).	More	More	
Space between lines of text.	Individual letters were sounds, not objects.	Phoenician	Interactive (with a computer/app, like Duolingo).	More	More	
Direction of the type.	It was the first written language.	Egyptian	Interactive (with a computer/app, like Duolingo).	More	More	I didn't understand some of the concepts.
Space between lines of text.	Individual letters were sounds, not objects.	Latin	Interactive (with a computer/app, like Duolingo).	More	More	
Space between individual letters.	Individual letters were sounds, not objects.	Latin	Lecture	More	More	
Space between individual letters.	Individual letters were sounds, not objects.	Latin	Interactive (with a computer/app, like Duolingo).	More	Less	
Space between lines of text.	It was the first written language.	Latin	Interactive (with a computer/app, like Duolingo).	More	More	Sometimes couldn't drag the slide bar; could only click certain positions to move it.
When text leads your eyes to a focal point.	Individual letters were sounds, not objects.	Latin	Watching a video	More	Less	I had some issues progressing through the content.; I didn't understand some of the concepts.
Space between lines of text.	Individual letters were sounds, not objects.	Old Italic	Interactive (with a computer/app, like Duolingo).	More	More	

When text leads your eyes to a focal point.	Individual letters were sounds, not objects.	Phoenician	Interactive (with a computer/app, like Duolingo).	More	about the same	
When text leads your eyes to a focal point.	Individual letters were sounds, not objects.	Latin	Watching a video	More	Less	I had problems with one of the activities.
Space between lines of text.	Individual letters were sounds, not objects.	Phoenician	Watching a video	More	More	